10th Science Questions – New Book

[Book Back + Important Questions]

1. Laws of Motion

I. Choose the correct answer:

1. Inertia of a body depends on
   a) weight of the object — b) acceleratioi due to gravity of the planet
   c) mass of the object — d) Both a & b
2. Impulse is equals to
   a) rate of change of momentum — b) rate of force and time
   c) change of momentum — d) rate of change of mass
3. Newton's III law is applicable
   a) for a body is at rest — (b) for a body in motion
   c) both a & b — d) only for bodies with equal masses
4. Plotting a graph for momentum on the X-axis and time on Y—axis. slope of momentum time graph gives
   a) Impulsive force — b) Acceleration
   c) Force — d) Rate of force
5. In which of the following sport the turning effect of force used?
   a) swimming — b) tennis
   c) cycling — d) hockey
6. The unit of'g' is ms^{-2}. It can be also expressed as
   a) $cm\ s^{-1}$ — **b) $N\ kg^{-1}$**
   c) $N\ m^2\ kg^{-1}$ — d) cm^2s^{-2}
7. One kilogram force equals to
   a) 9.8 dyne — b) $9.8x10^4$ N
   c) 98 x 10^4 dyne — d) 980 dyne
8. The mass of a body is measured on planet Earth as M kg. When it is taken to a planet of radius half that of the Earth then its value will be _____ kg
   a) 4 M — b) 2 M — c) M/4 — **d) M**
9. If the Earth shrinks to 50% of its real radius its mass remaining the same, the weig of a body on the Earth will
   a) decrease by 50% — b) increase by 50%
   c) decrease by 25% — **d) increase by 300%**
10. To project the rockets which ofthe following principle(s) is /(are) required?
    a) Newton's third law of motion — b) Newton's law of gravitation
    c) law of conservation of linear momenm — **d) both a and c**
11. Physics that deals with thc effect of force on bodies is
    a) Kinematics — b) Dynamics
    c) Statics — **d) Mechanics**
12. _____ deals with the bodies which are at rest under the action of forces.
    a) Statics — b) Kinematics
    c) Dynamics — d) Mechanics
13. Study of moving bodies under the action of forces _____
    a) Statics — b) Kinematics
    c) Dynamics — d) Mechanics
14. The resistance of a body to change its state of rest is called

a) inertia of rest b) inertia of motion
c) momentum d) inertia of direction

15. The resistance of a body to change its state of motion is called
a) force b) momentum
c) inertia of motion d) inertia of direction
16. The resistance of a body to change its direction of motion is
a) force b) momentum
c) inertia of motion **d) inertia of direction**
17. Mixing sugar in a glass of milk using a spoon is _____
a) force b) momentum
c) inertia of motion d) inertia of direction
18. The act of cleaning a carpet by heiting it with a stick is an example for ineriia of
a) motion b) direction
c) rest d) momentum
19. A luggage is usually tied with a rope on the roof of the buses due to
a) Inertia of motion b) inertia of direction
c) inertia of rest d) momentum
20. The momentum of a heavy object at rest will be
a) large b) infinity
c) zero d) small
21. Inertia is a _____
a) property of matter b) type of force
c) the speed of an object d) none ofthe above
22. A & B are two objects with masses 100 kg & 75 kg respectively, then _____
a) both will have same inertia b) B will have more inertia
c) A will have more inertia d) both will have less inertia
23. The physical quantity which is the measure of inertia is _____
a) density b) weight
c) force **d) mass**
24. The sparks produced during sharpening a knife against a grinding wheel leaves the rim of the wheel tangentially. This is due to
a) inertia of rest b) inertia of motion
c) inertia of direction d) force applied
25. The law that gives a qualitative definition of force is _____
a) Newton's I law b) Newton's II law
c) Newton's III law d) Law of gravitation.
26. The SI unit of force is
a) energy b) joule
c) newton d) dyne
27 . A force is applied by direct physical contact between two bodies is
a) Contact force b) Non-contact force
c) balanced force d) unbalanced force
28. Gravitational, magnetic and electro magnetic forces are example for _____ force.
a) contact **b) non-contact**
c) balanced d) unbalanced
29. Opening a door is an example of ___
a) a non contact force **b) contact force**
c) balanced d) unbalanced

30. A body is said to be under balanced force when the resultant force applied on that body is
a) zero b) infinite
c) one d) none
31. _____ is an example for non – contact force.
a) magnetic b) frictional
c) rolling ball d) none
32. if equaI or unequal forces act along opposite directions parallel to each other, then they arc called _____ parallel forces.
a) resultant b) equilibriamt
c) like **d) unlike**
33. Thc rotating or turning effect ot a force is
a) Momemtum **b) torque**
c) couple d) none
34. Acceleration of an object will increase as the net forces increases depending on its
a) volume **b) mass**
c) shape d) density
35. The formula used for Newton's II law of motion
a) Force = mass x acceleration b) Velocity = acceleration x time
c) :Momenturn = mass x velocity d) Speed= distance | time
36. An ice skater pushes harder with his leg muscles, he begins to move faster. This is an example of
a) Newton's I law **b) Newton's Il law**
c) Newton's Ill law d) Law of conservation
37. You're riding a bike when suddenly you hit a large rock. The bike sto s moving but you fly over the handle bars. This is an example of
a) Newton's I law b) Newton's Il law
c) Newton's Ill law d) Law of conservation
38. When you paddle a canoe, the canoe goes forward. This is a example of _____
a) Newton's I law b) Newton's Il law
c) Newton's III law d) Law of conservation
39. The acceleration in a body is due to
a) balanced force **b) unbalanced force**
c) equilibriant d) couple
40. When an object undergoes acceleration
a) its Speed always increase **b) a force always acts on it**
c) its velocity always increases d) velocity always decreases
41. A force of 20 N is acting on an object of mass 10 kg. The acceleration produced is
a) 1 ms^{-2} **b) 2 ms^{-2}** c) 20 rns^{-2} d) 10 ms^{-2}
42. The physical quantity which is equal to rate of change of momentum is
a) displacement b) acceleration
c) force d) impulse
43. The physical quantity which is equal to change in momentum is
a) velocity b) acceleration
c) force **d) impulse**
44. An example for a vector quantity is
a) speed b) distance
c) momentum d) length
45. Impulse is equal to

a) ma **b) Ft** c) mv d) $\frac{v-u}{t}$

46. SI unit of impulse is
a) Ns b) Ns^2 c) kg ms^{-2} d) kg rn^2s^{-2}
47. The gravitational force of earth acting on a body of mass 1 kg is _____
a) 8.9 N **b) 9.8 N** c) 980 N d) 1 N
48. The resultant of action & reaction forces is _____
a) greater than zero b) less than zero
c) zero d) one
49. Rocket works on the principle of conservation of
a) mass b) energy
c) momentum d) velocity
50. Which of the following statement is not correct for an object moving along a straight path in an accelerated motion?
a) its speed keeps changing b) its velocity always changes
c) it always goes away from the earth d) A force is always acting on it
51. According to the Newton's III law of motion, action & reaction
a) always act on the same body b) have same magnitude & direction
c) always act in opposite directions d) act on either body at normal to each other
52. A water tanker filled up to $\frac{2}{3}$ of its height is moving with a uniform speed, on sudden application of the brake, the water in the tank would
a) move backward b) be unaffected
c) rise upwards **d) move forward**
53. A body of mass 1 kg is attracted by the earth with a force which is equal to
a) 9.8 N b) 6.67×10^{11} c) 1N d) $9.8ms^{-1}$
54. Thevalue of g
a) increases as we go above the earth's surface
b) decreases as we go to the centre of the earth
c) remains constant
d) is more at equator and less at poles
55. The ball is thrown up, the value of g will be
a) zero b) +ve **c) –ve** d) negligible
56. The distance between two bodies becomes 6 times more than the usual distance, then force becomes
a) 36 times b) 6 times c) 12 times **d) $\frac{1}{36}$ times**
57. The gravitational force between two objects becomes _____when the masses of both objects are halved without altering the distance between them.
a) $\frac{f}{4}$ b) $\frac{f}{2}$ c) f d) 2f
58. Newton's law of gravitation applies to
a) small bodies only b) plants only
c) all bodies irrespective of their size d) for solar system
59. A thief stole a box with valuable article of weight 'w' and jumped down a wall of height 'h'. Before he reached the ground he had experienced a load of
a) $\frac{w}{2}$ **b) zero** c) w d)2w
60. If the radius of the earth were to shrink by one percent its mass remaining the same, the acceleration due to gravity on the earth's surface would
a) decrease b) remains unchanged
c) increase d) none of these

61. The force of gravitation between two bodies in the universe does not depend on.
    a) the distance between them b) the product of their masses
    c) the sum of their masses d) the gravitaionla constant
62. At the surface of earth an obect falling freely experiences an acceleration of
    a) 9.4 ms^{-2} b) 9.1 ms^{-1} **c) 9.8 ms^{-2}** d) 9.6 ms^{-2}
63. The magnitude of the weight is expressed by the units of
    a) displacemcnt b) mass (kg)
    c) force (Newton) d) none
64. The value of universal gravitational constituent is
    a) 6.743x 10^{-11} Nm^2 kg^{-1} **b) 6.673 x 10^{-11} Nm^2 kg^{-1}**
    c) 6.743 x 10^{-11} Nm^2 kg d) 6,673x 10^{-1} Nm^2 kg^{-1}
65. The weight of an object in a satellite orbiting around the earth is
    a) zero b) actual weight
    c) less than the actual weight d) greater than the actual weight
66. The motion of falling bodies towards earth is due to
    a) gravitational rotation b) weightless mass
    c) acceleration due to gravity **d) gravitational force**
67. Which quantity is zero at the centre of the earth?
    a) mass **b) weight**
    c) both mass & weight d) none
68. The acceleration due to gravity varies on earth with
    a) distance b) height
    c) mass of object **d) all the above**
69. A lift of mass 1000 kg which is moving with an acceleration of 1 ms^{-2} in upward direction, then the tension developed in string which is connected to lift is
    a) 10,000 N **b) 10,800 N** c) 9800 N d) 11000 N
    R>W;F=R—W :. R=mg+ma
    R=m(g+a)= 1000(9.8+ 1)=10,800N
70. If lift is accelerated in the upward direction, then the apparemt weight of a body is
    a) more than true weight b) equal to the true weight
    c) less than true weight d) not equal to the true weight
71. Cutting tools have sharp edges to
    a) increase area of contact b) decrease pressure
    c) decreases area and increase pressure d) increase area & increase pressure
72. What would happen, if the force of gravity disappears suddenly on earth?
    a) All objects would move in a rapid whirl wing b) All object will float
    c) not possible d) cannot say

II. FILL IN THE BLANKS:

1. To produce a displacement **force** is required.
2. Passengers lean forward when sudden brake is applied in a moving vehicle. This can be explained by **inertia of motion.**
3. By convention, the clockwise moments are taken as **negative** and the anticlock wise moments are taken as **positive**.
4. **Gear** is used to change the speed of car.
5. A man of mass 100 kg has a weight of **980 N** at the surface of the Earth.
6. **Kinematics** deals with the motion of bodies without considering the cause of motion.
7. Kinetics deals with the motion of bodies considering the **cause of motion**

8. According to Aristotle, a moving body naturally comes to rest without any external force is termed as **natural motion.**
9. If the body behaves contrary to their own natural state is called **violent motion**
10. The two different mass bodies dropped, the **heavier** falls faster.
11. Bodies of different size, shape and mass fall from a height in **vacuum** reach the ground at the same time.
12. A body does not change its state during the period of time, then it is said to be at **rest**.
13. A body changes its state, then it is said to be in **motion**.
14. The resistance of a body to change its state is called **inertia**.
15. The product of mass & velocity of a moving body is **momentum**.
16. A sharp turn while driving a car, tend to lean sideways is due to **inertia of direction**.
17. Momentum is a **vector** quantity.
18. An athlete can take a longer jump if he comes running from a distance compared to that when he jumps suddenly. This type of inertia is **inertia of motion**.
19. When a force of 1N acts on a mass of 1kg that is forced to move,the object moves with **an acceleration of 1ms^{-2}**
20. The acceleration in a body is due to **unbalanced force**
21. When an object undergoes acceleration **a force always acts on it**
22. Non - contact force is also known as **field** force.
23. Kicking a Dot ball is a **contact** force.
24. In balanced force, the resultant force is equal to **zero**.
25. The combined effect of multiple forces is balanced by a single force is called **resultant**.
26. The force which is equal to resultant but opposite in direction is called as **equilibrant.**
27. Like Parallel forces are two forces that act along **same** direction.
28. Torque is a **vector** quantity.
29. Unit of torque is **Nm**.
30. Two equal and unlike parallel force is called **couple**.
31. If the object is rotated in clock wise direction, couple is **negative**
32. Winding or unwinding a screw is an example for **couple.**
33. The moment of a couple is the product of **force** and perpendicular distance between the forces.
34. Steering wheel is based on the application of **torque**.
35. **Gears** helps to change the speed of the rotation.
36. The algebraic sum of the moments in the clockwise direction is **equal** to the algebraic sum moments in the anticlockwise.
37. 1 kg *f* equal to **9.8 N.**
38. 1 N is equal to **1 kg ms^{-2}**
39. The momentum of massive object at rest is **zero**.
40. The product of mass and velocity is known as **momentum**.
41. A boy of mass 50 kg runs with a force of 100 N his acceleration would be **(2ms^{-2}) F=ma .: a=** $\frac{F}{m} = \frac{100}{50}$ **= 2ms^{-2}**
42. The force of gravitation is inversely related to **square of distance between masses**.
43. Weight of the body acquired due to gravity is **apparent weight**.
44. When a person falls freely under the action of gravity has **zero weight,**
45. . The apparent weight of an object **increases** in an elevator while accelerating upward.
46. Everything in feely falling system. Appears to be **weightless**.
47. When velocity of lift changes, apperent weight **differs** from true weight.
48. Mass is the measure of **matter**.

49. Weight is the measure of force of **gravity** on an object.
50. The unit of weight is **newton**.
51. The unit of mass is **kilogram**.
52. Mass which is associated with force and inertia is **inertial mass**.
53. The weight of a 1 kg mass object on earth is **9.8 N**
54. Mass is associated with gravitational force is **gravitational mass**.
55. Astronauts are not floating but falling freely due to huge **orbital velocity**.
56. **Centripetal** force keeps the satellite in its orbit.
57. To study the dimensions of heavenly bodies' **gravitational** law is used.

III. State whether the following statements are True or False. Correct the statement if it is False:

1. The linear momentum of a system of particles is always conserved.
   Ans: False. In the absence ot external force, the linear momentum of a system of partic1e is always conserved
2. Apparent weight of a person is always equal to his actual weight
   Ans: False. Both apparent weight and actual weight can be greater or lesser according to the movement of the Person inside the lift.
3. Weight of a body is greater at the equator and less at the polar region.
   Ans: False. Weight of a body is **less** at the equator and **more** at the polar region.
4. Turning a nut with a spanner having a short handle is so easy than one with a long handle.
   Ans: False. Turning effect (i.e torque) depends on perpendicular distance of the line of action of the applied force N= Fxd
5. There is no gravity in the orbiting space station around the Earth. So the astronauts feel weightlessness.
   Ans. False.When space station and astronauts have equal acceleration, they are under free fall condition, so both astronaut and space station are in the state of weightlessness.
6. In the recoiling of a gun on firing, both the linear momentum and kinetic energy are conserved.
   Ans: False. Only linear momentum is conserved kinetic energy **increases**.
7. Change in linear momentum can be produced by applying larger force for a longer period of time.
   Ans: False. Change in momentum can be produced by applying larger force for a **shorter** time.
8. In free fall under gravity, a body appeals to be weightless.
   Ans: True.
9. The relation below absolute units of force on MKS and C.G.S system is 1 N = 10^5 dyne.
   Ans. True.
10. Newton's first law defines force and inertia.
    Ans: True.
11. The unit of force and impulse is same.
    Ans: False. Impulse = F x t, unit is Ns.
12. Galileo suggested, that an external force is required to keep a body in uniform motion.
    Ans: False. Aristotle explained.
13. Forces of action and reaction never cancel each other as they are acting at different bodies.
    Ans: True.
14. Two bodies of different masses are allowed to fall freely from the same height, then both the bodies reach the earth together.
    Ans: False. If air resistance for each body is same, both will reach the earth together.
15. A person's apparent weight inside the lift increases when lift is accelerated upward.
    Ans: True.
16. Newton's law of gravitation helps in discovering new stars and planets.
    Ans: True.
17. The value of 'g' is maximum at the equatorial region and minimum in the polar region.

Ans: False. The value of'g' is **minimum at the equatorial** region and **maximum in the polar** region.

18. Acceleration due to gravity can also be expressed as g = .$\frac{GM}{R^2}$

    Ans: True.

19. Value of 'g' is zero at the centre of the earth.

    Ans: True.

20. 1 kg f=980 dyne

    Ans: False. 1 kg f= 9.8 N

21. The velocity which is sufficient to just escape from the gravitational pull of the earth is called variable velocity.

    Ans: False. The velocity which is sufficient to just escape from the gravitational pull of the earth is called **escape velocity**.

IV. MATCH THE FOLLOWING:

a) 1. Newton's I law - a) Propulsion of a rocket
2. Newton's II law - b) Stable equilibrium of a body
3. Newton's III law - c) Law of force
4. Law of conservation of linear momentum - d) Flying nature of bird

Ans: 1-b; 2-c; 3-d; 4-a

b) 1. Principle of moments - a) Rotating force
2. Torque - b) GM $\frac{m}{R^2}$
3. Gravitational force - c) $F_B = -F_A$
4. Newton's III law - d) Sum of clockwise moments = sum of anticlockwise moments

Ans: 1- d; 2- a; 3-b; 4-c

c) 1. Statics - a) force acting on moving bodies
2. Dynamics - b) Cause of motion
3. Kinematics - c) Not considering the cause of motion
4. Kinetics - d) Force acting on rest bodies

Ans: 1- d; 2- a; 3-c; 4-b

d) 1. Natural motion - a) Push or pull
2. Violent motion - b) Force independent
3. Inertia - c) Dependent
4. Force - d) Inability to change its state

Ans: 1- c; 2- b; 3-d; 4-a

e) 1. Compressing a spring & muscular force - a) Unbalanced force
2. Electro magnetic force - b) Contact force
3. Tug of war - c) Non – contact force
4. Action of a lever - d) Unlike parallel forces

Ans: 1- b; 2- c; 3-d; 4-a

f) 1. Moment of force - a) 1 gram force
2. Two equal & inlike force - b) Torque
3. Principle of moments - c) Couple
4. 980 dyne - d) $F_1 \times d_1 = F_2 \times d_2$

Ans: 1- b; 2- c; 3-d; 4-a

g) Quantity		**Unit**
1. Acceleration due to gravity	-	a) N m^2kg^{-2}
2. Inertial mass	-	b) N
3. Universal gravitational constant	-	c) ms^{-2}
4. Weight	-	d) kg

Ans: 1- c; 2- d; 3-a; 4-b

h) 1. Downward motion of the object with a ≠ g - a) Apparent weight equals to zero
2. Upward motion of the object with a ≠ g - b) no loss; no gain
3. Downward motion of the object with uniform velocity a = 0. - c) apparent weight loss
4. Downward motion of the object with a=g - d) apparent weight gain

Ans: 1- c; 2- d; 3-b; 4-a

i) 1. m x a - a) impulsive force
2. m x v - b) acceleration due to gravity
3. f x t - c) force
4. W/ m - d) momentum

Ans: 1- c; 2- d; 3-a; 4-b

j) 1. Galileo Galilel - a) Cause of motion
2. Newton - b) Mass energy relation
3. Aristotle - c) Natural rest of moving body
4. Einstein - d) Acceleration due to gravity is same for all objects.

Ans: 1- d; 2- a; 3-c; 4-b

V. Assertion and Reason:

Mark the correct choice as

a) if both the assertion and reason are true and the reason is the correct explanation of assertion.

b) If both the assertion and the reason are true, but the reason is not the correct explanation of the assertion.

c) Assertion is true, but the reason is false.

d) Assertion is false, but the reason is true.

1. Assertion: The sum pf the clockwise moments is equal to the sum of the anticlockwise moments.
Reason: The principle fo sonservation of momentum is valid if the external force on the system is zero.
Ans: b) both the assertion and the reason are true, but the reason is not the correct explanation of the assertion
2. Assertion: The value of 'g' decreases as height and depth increases from the surface of the Earth.
Reason: 'g' depends on the mass of the object and the Earth.
Ans: c) Assertion is true, but the reason is false.
3. Assertion: A rocket moves forward by pushing the surrounding air backwards.
Reason: It drives the necessary thrust to move forward, according to Newton's second law.
Ans. d) Assertion is false but reason is true.
4. Assertion: No force is required to move a body uniformly along a straight line.
Reason: Because F = ma = m(0) = 0.
Ans: a) both the assertion and reason are true and the reason is the correct explanation of assertion.
5. Assertion: A force of 1 kg force produces an acceleration of 1 m/s^2 in a body of mass 1 kg.
Reason: a = F/m
Ans: d) Assertion is false but reason is true
6. Assertion: The net force acting on a body is zero.
Reason: The body is moving uniforrnly along a straight line.
Ans: a) Both assertion and reason are true and reason is the correct explanation of assertion.
7. Assertion: Action and reaction forces balnce each other.
Reason: Both forces act always on two different bodies.
Ans: c) Assertion is true but reason is false.
8. Assertion: The universal gravitational constant is same as acceleration due to gravity.

Reason: Gravitationla constant & acceleration due to gravity have different units.

Ans: d) Assertion is false but reason is true.

Hint: $G = Nm^2\ kg^{-2}$; $g = ms^{-2}$;

$G = 6.67 \times 10^{-11}\ Nm^2\ kg^{-2}$; $g = 9.8\ ms^{-2}$

9. Assertion: The value of acceleration due to gravity does not depend upon mass of the body on which force is applied.

Reason: Acceleration due to gravity is a constituent quantity.

Ans: c) Assertion is true but reason is false.

Hint: $g = GM/R^2$ g does not depend on mass of the body on which it is acting.

10. Assertion: If a pendulum is suspended in a lift and lift is falling freely, then its time period becomes infinite.

Reason: Free falling body has acceleration equal to acceleration due to gravity

Ans: a) Both assertlon and reason are true and reason is the correct explanation of assertion.

Hint: a = g; $T = 2\pi \sqrt{\frac{I}{g-a}}$ $T = \infty$

11. Assertion: If earth suddenly stops rotating the value 'g' becomes same at all places.

Reason: 'g' depends on the distance between two objects.

Ans: b) Both assertion and reason are true but reason is not the correct explanation of assertion.

12. Assertion: The ratio of inertial mass to gravitational mass is equal to one.

Reason: The inertial mass & gravitational mass of a body are equivalent

Ans: a) Both assertion and reason are true and reason is the correct explanation of Assertion.

Hint: Both are scalar & measured in same unit.

13. Assertion: Like forces equal in magnitude simultaneously acts on a body leads translatory or rotator motion.

Reason : Act in the same direction of action of force leads translatory; acting tangent to the body leads rotatory.

Ans: a) Both assertion and reason are true and reason is the correct explanation of assertion.

VI. Use the Analogy to fill in the blanks:

1. Unit of linear force : N :: Unit of torque : **Nm**
2. Unit of force in CGS is 1 dyne = 1 g cm s^{-1} :: Unit of force in SI is 1 N = **10^5 dyne.**
3. Inertia : Moment of inertia :: **Force** : Moment of force.
4. Opening a pen cap:**Moment of couple** :: Opening the door: moment of force
5. Clockwise moment: negative, :: Anti -clockwise moment: **Positive**.
6. R=m(g-a): R<W :: **R = mg** : R=W
7. Natural motion : force independent :: **Violent motion** : force dependent

VII. Arrange the fouowlng in correct sequence:

1. Arrange the scientists according to their periods and achievements.

Galileo, Einstein, Newton, Nicolaus Copernicus

Ans: Nicolaus Copernicus, Galileo, Newton, Einstein.

2. Arrange the physical quantities in order based on mass factor.

Impulse, Force, Momentum, Mass

Ans: Mass, Momentum, Force, Impulse

Hint: Mass, Momentum — Mass x Velocity

Force = $\frac{\text{Momentum}}{\text{Time}}$

Impulse - Force x time

2. OPTICS

I. Choose the correct answer:

1. The refractive index of four substances A, B, C and D are 1.31. 1.43. 1.33, 2.4 respectively. The speed of light is maximum in
   a) A b) B c) C d) D
2. Where should an object be placed so that a real and inverted image of same size is obtained by a convex lens.
   a) f **b) 2f** c) infinity d) between f and 2f
3. A small bulb is palced at the principal focus of a convex lens. When the buld is switched on, the lens will produce.
   a) a convergent beam of light b) a divergent beam of light
   c) a parallel beam of light d) a coloured beam of light
4. Magnifiction of a convex lens is
   a) positive b) negative
   c) either positive or negative d) zero
5. A convex lens forms a real, diminished point sized image at foucs. Then the position of the object is at
   a) focus **b) infinity**
   c) at 2f d) between f and 2f
6. Power of a lens is -4D then its focal length is
   a) 4m b) -40m
   c) -0.25m d) -2.5m
7. In a myopic eye, the image of the object is formed
   a) Behind the retina b) on the retina
   c) infront of the retina d) on the blind spot
8. The eye defect 'presbyopia' can be corrected by
   a) convex lens b) concave lens
   c) convex mirror **d) Bi focal lenses**
9. Whch of the following lens would you prefer to use while reading small letters found in a dictionary?
   a) a convex lens of focal length 5 cm. b) A Concave lens of focal length 5 cm
   c) A Convex lens of focal length 10 cm d) A concave lens of focal length 10 cm.
10. If V_B, V_G, V_R be the velocity of blur, green and red light respectively in a glass prism, then which of the following statement gives the correct relation?
    a) $V_B = V_G, = V_R$ b) $V_B > V_G > V_R$
    c) $V_B < V_G < V_R$ d)$V_B < V_G > V_R$
11. The plath of light is _____
    a) rays b) point
    c) lines d) beam
12. The group of rays is _____
    a) lines b) dots
    c) beam d) none of these
13. The velocity of light is _____
    a) 3×10^{-8} ms^{-1} **b) 3×10^{8} ms^{-1}**
    c) 3×10^{8} kms^{-1} d) 3×10^{-8} km s^{-1}
14. Velocity and wavelength of light are related by a relation
    a) $g = c\lambda$ b) $\gamma = \frac{c}{\lambda}$ c) $c = \gamma\lambda$ **d) both b & c**
15. Violet and red light _____ wavelengths.
    a) lowest, highest b) hightest, lowest
    c) same d) standard
16. We can see objects because of

a) reflection b) refraction
c) transmission d) diffraction

17. _____ determines speed of light in a mediusm.
a) thickness b) wavelength
c) refractive index **d) both b and c**

18. When light travels from rarer to denser medium, the refracted ray is _____ the normal.
a) bent away b) along
c) bent towards d) just grazes the surface of separation

19. For air, the refractive index is
a) 1 b) infinity c) 0 d) 1

20. When the ray of light travels from one medium to another, it bends. This phenomenon is called
a) reflection b) dispersion
c) refraction d) interference

21. The splitting up of white light into colours is called.
a) reflection b) refraction
c) scattering **d) dispersion**

22. On a rainy day, small oily films on water show brilliant colours. This is due to
a) scattering **b) dispersion**
c) reflection d) refraction

23. Rainbow formation is due to _____ water droplets.
a) ionization b) absorption of sunlight
c) reflection and refraction of sunlight d) reflection of sunlight

24. Red light is used in traffic signals because
a) it has hightes wavelength b) disperses least
c) red is symbol of danger **d) both a &b**

25. A star appears twinkling in the sky because of _____ by the atmosphere.
a) scattering of light b) reflection of light
c) refraction of light d) both a and b

26. When a beam of light is passed through a colloidal solution, the light will be
a) scattered b) reflected
c) absorbed d) unchanged

27. If the energy of the incident and scattered beam of light are same, then it is called _____ scattering.
a) ray light b) inelastic
c) mie **d) elastic**

28. The scattering of light by colloidal particles is _____ scattering.
a) Ray light b) mie
c) raman **d) tyndall**

29. The scattering of light by pure light is _____ scattering.
a) Rayleigh's b) Mie
c) Raman d) Tyndall

30. The scattered light in Raman scattering contains _____ lines.
a) Rayleigh's b) stokes
c) Antistokes **d) all above**

31. Conves lens produces a _____ beam of light.
a) convergent b) divergent
c) scattered d) dispersed

32. A concave lens is a

a) converging lens **b) diverging lens**
c) inverting lens d) magnifying lens

33. In spherical lenses, all distance are measured from
a) optic centre b) principal focus
c) principal axis d) centre of curvature
34. The part of the lens through which the ray of light passes without suffering deviation is called.
a) focus b) centre of curvature
c) pole **d) optic centre**
35. Convex lens always forms a real image, if the object is situated beyond
a) optic centre b) centre of curvature
c) focus d) radius of curvature
36. A convex lens forms a virtual image if the object is
a) at F b) at infinity
c) below F and 2F **d) below the lens and the principal focus**
37. The image formation by spherical lenses is due to the phenomenon of
a) reflection **b) refraction**
c) interference d) dispersion
38. According to snell's law
a) $\boldsymbol{\mu = \frac{\sin i}{\sin r}}$ b) $\mu = \frac{c_a}{c_m}$
c) $\mu = \frac{\sin r}{\sin i}$ d) $\mu = \frac{c_m}{c_a}$
39. To get real, inverted and same size of the object, the object is placed in convex lens is _____
a) At F **b) At 2F**
c) below O and F d) at infinity
40. When a ray of light enters glass from water it bends
a) towards the normal due to decrease in the speed of light.
b) towards the normal due to increase in the speed of light.
c) away from the normal due to increase in the speed of light.
d) away from the normal due to decrease in the speed of light.
41. The point at which the principal axis meets the surface of the lens is
a) cnetre of curvature b) radius of curvature
c) focus **d) pole**
42. When a person uses a convex lens as a simple magnigying glass, the object must be placed at a distance.
a) less than one focal length b) more than one focal length
c) less than twice focal length d) more than twice the focal length.
43. The distance below the lens and focus is called
a) pole b) radius of curbvature
c) focal length d) principal axis
44. Hightly enlarged image is obtained by convex lens when object is at
a) infinity **b) F**
c) below F & C d) beyond 2F
45. Convex lens forms a hightly diminished, real and inverted image, when an object is at
a) infinity b) F
c) below F&C d) beyond 2F
46. Convex lenses are used in
a) camera b) magnifying lens
c) microscope **d) all the above**

47. Real images formed by convex lenses are always.
    a) on the same side of the object **b) inverted**
    c) erect d) smaller than the object
48. An object is placed at 12cm from a convex lens whose focal length is 10cm. the image must
    a) virtual and enlarged b) real and reduced in size
    c) virtual and reduced size **d) real and enlarged size**
49. The image produced by a concave lens is
    a) always virtual & enlarged **b) always virtual & diminished**
    c) always real d) sometimes real, sometimes virtual
50. An object is palced 25cm from a convex lens whose focal length is 10cm. the image distance is _____ cm
    a) 50 **b) 16.66**
    c) 6.66 d) 10

$\frac{1}{f}=\frac{1}{v}=\frac{1}{u}$ ➔ $\frac{1}{v}=\frac{1}{f}+\frac{1}{u}=\frac{1}{10}+\frac{1}{-25}=\frac{1}{10}-\frac{1}{25}$

51. Magnification produced by a lens is
    a) $\frac{height\ of\ the\ image}{height\ of\ the\ object}$ b) $\frac{Distance\ of\ the\ image}{Distance\ of\ the\ object}$
    c) both a&b d) $\frac{1}{v}-\frac{1}{f}=\frac{1}{u}$
52. Lens formula is
    a) $\frac{h^1}{h}$ **b)** $\boldsymbol{\frac{1}{f}=\frac{1}{v}-\frac{1}{u}}$
    c) $\frac{v}{u}$ d) $(\mu\text{-}1)\left[\frac{1}{R_1}-\frac{1}{R_2}\right]$
53. Lens makersformula is
    a) $\frac{h^1}{h}$ b) $\frac{1}{f}=\frac{1}{v}-\frac{1}{u}$
    c) $\frac{v}{u}$ **d)** $\boldsymbol{(\mu\text{-}1)\left[\frac{1}{R_1}-\frac{1}{R_2}\right]}$
54. In a concave lens when an object is between optic centre and infinity, the image will be
    a) at F b) at 2F
    c) between O and F d) beyond 2F
55. The reciprocal of the focal length of the lens is
    a) magnification **b) power**
    c) principal focus d) none
56. The image formed by retina of human eye is
    a) virtual and eract **b) real & inverted**
    c) virtual & inverted d) real & erect
57. The least distance of distinct vision is
    a) 25m b) 20cm
    c) 20m **d) 25cm**
58. The change in the focal length of human eye is caused by
    a) pupil **b) ciliary muscles**
    c) cornea d) iris
59. The phenomena of light responsible for the working of the human eye is
    a) refelctiohn **b) refraction**
    c) power d) accommodation
60. The amount of light entering the human eye is
    a) ciliary muscles **b) pupil**

c) cornea d) iris

61. The part of the eye refracts light entering the eye from external objects?
    a) Lens **b) Cornea**
    c) Iris d) Pupil
62. The diameter of eyeball is
    a) 2.3 cm b) 23 cm c) 2.3 mm d) 23 mm
63. A person cannot see objects clearly beyond 50 cm. The power of lens to correct the vision is
    a) +5 D b) -0.5 D **c) -2D** d) +2D
64. The human eye forms the image of an object at its
    a) Cornea b) Iris c) Pupil **d) Retina**
65. When a person is myopic, he/ she can clearly see
    a) Both nearby & far off **b) Only nearby objects**
    c) Only far off objects d) neither nearby nor far off objects
66. The defect of myopia can be corrected by using
    a) Concave b) Convex
    c) Combination of lenses d) None
67. A convex lens is used to correct the defect of
    a) Presbyopia **b) Hypermeteropia**
    c) Myopia d) Astigmatism
68. Presbyopia is due to
    a) Lengthening of eye ball b) shortening of eye ball
    c) ageing d) development of cataract
69. Presbyopia is corrected by
    a) concave **b) bifocal**
    c) convex d) cylindrical
70. In Astigmatism, eye cannot see
    a) distance object b) nearby object
    c) parallel lines d) both a&b
71. Cylindrical lens is used to correct
    a) Myopia b) Hypermetropia
    c) Presbyopia **d) Astigmatism**
72. Simple microscope consists of
    a) short focal length convex b) large focal length of cancave
    c) short focal length of concave d) large focal length of convex
73. Simple microscopes are used
    a) to observe paths of flower b) watch repair
    c) observe finger prints **d) all the above**
74. Magnification of compound microscope is given by
    a) $M= 1 + \frac{D}{f}$ b) $m= \frac{v}{u}$
    c) $m= \frac{v}{u}(1+\frac{D}{fe})$ d) $m= \frac{v}{u}(1 - \frac{D}{fe})$
75. Magnification power of microscopes canbe included by using of lengths
    a) large focal eye piece b) objective lens
    c) shorter focal length of the eye piece d) larger focal length of objective
76. To heavenly objects like stars _____ is used.
    a) simple microscope **b) compound microscope**
    c) terrestrial d) astronomical
77. To increase the magnification of the telescope_____

a) increase the focal length of the objective.
b) increase the focal length of the eye piece.
c) decrease the focal length of the eye piece.
d) both a&c

78. To view the objects on the surface of the earth.
a) simple b) compound microscope
c) terrestrial d) astronomical

79. The resolving power depends on
a) dimetal of the lens b) wavelength
c) refractive index **d) a&b**

80. A lens which collects image at back of telescope
a) objective lens b) diverging
c) converging d) polars

81. In compound microscope, as compare to eye piece, objective lens has _____ focal length.
a) –ve focal length b) zero
c) small d) large

82. A magnifying glass is also called
a) telescope b) compound microscope
c) simple microscope d) astronomical telescope

83. As compate to single lens, compound microscope gives _____ magnification.
a) smaller **b) greater**
c) no d) equal

84. As compare to single lens, compound microscope gives _____
a) smaller of eye lens of an adult human being is a 3D
b) 4D c) 5D d) 6D

85. In a simple microscope to obtain higher magnification, the focal length convex lens should be____
a) large **b) small**
c) 1 cm d) none

86. An inverted image of the object is formed in _____
a) simple microscope b) compound microscope
c) Astronomical microscope d) both b&c

87. Device used to see very very small object is _____
a) simple microscope **b) compound microscope**
c) telescope d) mirror

88. In compound microscope _____ lenses are used.
a) 2 b) 3 c) 4 d) 1

89. Image formed in simple microscope is
a) Erect b) inverted
c) smaller than object d) bright

90. Objective of telescope is of
a) short local length & short aperture b) Short local length & large aperture
c) Large focal length & large aperture d) large focal length & short aperture

91. Presbyopia is corrected by _____
a) concave **b) focal**
c) convex d) cylindrical

92. To increase the magnification of the telescope, the focal length of the _____
a) objective lens is small and eye lens is large.
b) objective lens is large and eye lens is small.

c) objective lens and eye lens are small.
d) objective lens and eye lens are large.

II. Fill in the blanks:

1. The path of the light is called as **ray**.
2. The refractive index of a transparent medium is always greater than **one**.
3. If the energy of incident beam and the scattered beam are same, then the scattering of light is called as **elastic** scattering.
4. According to Rayleigh's scattering law, the amount of scattering of light is inversely proportional to the fourth power of its **wavelength**.
5. Amount of light entering into the eye is controlled by **Iris**.
6. Blue and green light has different **wavelength and frequency**
7. Refraction is due to difference in **velocity** of light in different media.
8. Angle of refraction is **smallest** for red and **highest** for violet.
9. Refractive index of a medium is depended on **wavelength** of the light.
10. The interacting particle of the medium is called as **scatterer**.
11. The amount of scattering of light depends on **wavelength of light and size of the particle**.
12. White appearance of the clouds is due to **Mie scattering**.
13. The magnification is grater than 1, then the image obtained is **enlarged**.
14. The magnification is **less** than 1, then the image obtained is diminished.
15. The object is always placed on **left** side of the lens.
16. The power of convex lens is **+ve.**
17. The power of concave lens is **–ve**
18. Unit of power is **dioptre.**
19. 1D is equal to **$1m^{1}$**
20. The diameter of eye ball in our eye is **2.3 cm**
21. **Sclera** tough membrane protects the internal parts ot the eye.
22. **Cornea** is the thin and transparent layer on the front surface of eye ball which **refract** on to the lens.
23. The coloured part of the eye is **Iris**.
24. Iris **controls** amount of light entering into the pupil.
25. The pathway for the light to retina is **pupil**.
26. The image of objects is formed on **retain**.
27. Ciliary muscles help to change **focal length** of the eye lens according to the position of the object.
28. The refractive index of eye lens is **1.437**.
29. The eye lens is **convex** in nature.
30. The focal length of the eye lens is adjusted by **ciliary muscles**.
31. Eye lens is made of a **flexible, jelly like** material.
32. When the ciiary muscle relaxes, eye lens becomes **thinner**.
33. To increase the focal lengths, the ciliary muscle **relaxes**.
34. A normal human eye can be clearly when objects are placed between **25cm and infinity**,
35. Far point or distance of distinct vision for normal eye is **infinity**.
36. Least distance of distinct vision is **25 cm**
37. Myopia is called as **short sightedness**.
38. Myopia is corrected by **concave** lens.
39. Hypermeteropia is corrected by **convex** lens.
40. Presbyopia is corrected by **bifocal** lens.
41. Astigmatism is corrected by **cylindrical lens**.
42. According to optical property, telescope is classified into **refracting telescope and Reflecting telescope**.

43. According to the things which are observed **astronomical** and **terrestrial** are major types of telescopes.
44. **Astronomy** is used to view heavenly bodies.
45. The image in an astronomical telescope is **inverted**.
46. Terrestrial telescope is used to view objects **on the land.**
47. The image of terrestrial telescope is **erect**.
48. The focal length of objective lens is **shorter or lesser** than the eye pieces in compound microscope.

III. True or False if false correct it:

1. Velocity of light is greater in denser medium than in rarer medium.
   Ans: False. Velocity of light is **lesser** in denser medium than in rarer medium.
2. The power of lens depends on the local length of the lens.
   Ans: True.
3. Increase in the onverging power of eye lens cause 'hypermetropia'.
   Ans: True
4. The convex lens always gives small virtual image.
   Ans: False. **Concave lens** always gives small virutal image.
5. Stars and sun are non-luminous objects.
   Ans. False - Stars and sun are **luminous** objects.
6. Luminous objects which give out their own light.
   Ans. True.
7. Light always travels along curved line.
   Ans: False. Light always travels along **straight line**.
8. Material medium is needed for the propagation of light.
   Ans: False. Material medium **is not needed** for the propagation of light.
9. Different coloured light has same wavelength and frequency.
   Ans: False. Different coloured light **has different** wavelength and frequency.
10. Red light has the highest wavelength and violet has lowest wavelength.
    Ans True.
11. Incident ray and refracted ray lie in different plane.
    Ans: False. Incident ray and refracted ray **lie in same** plane.
12. The speed of light m a medium is low because of low refractive index of the medium.
    Ans: False. The speed of light in a medium is slow because of **high** refractive index of the medium.
13. When light travels from denser to rarer, refracted ray bent away from normal.
    Ans: True
14. When white light pass through transparent medium, it is split into colours is called dispersion.
    Ans: True
15. Mie scattering is responsible for the white appearance of the clouds.
    Ans: Ture.

I6. The distance below the principal focus and pole is focal length of the lens.
    Ans: True

17. Amount of scattering of light is directly proportional to fourth poWer of its wavelength.
    Ans: False. Amount of scattering of light is **inversely** proportional to fourth power of its wavelength.
18. In inelastic scattering, the energy of incident and scattered light are same.
    Ans: False. In inelastic scattering, the energy of incident and scattered light are **not same**.
19. The amount of scattering is independent of wavelength in Rayleigh scattering.
    Ans: False. The amount of scattering is independent of wavelength in **Mie s**cattering.
20. In Raman Scattering, the scattered light contains the lines having frequency less than incident is Antistokes.

Ans: False. In Raman scattering, the scattered light contains the lines having frequency less than incident is **stokes**.

21. If one of the faces of a bi-convex lens is plane. It is known as a plano-convex lens.
    Ans. True
22. The line joining the centre of curvature and the optic centre is pole.
    Ans. False. The line joining the centre of curvature and the optic centre is **principal axis**.
23. The geometrical centre of the lens is called optic centre.
    Ans. True.
24. When a ray strikes the pole or optic centre of the concave or convex lens it gets deviated
    Ans: False. When a ray strikes the pole or optic centre of the concave or convex lens it gets **no deviation**.
25. To get parallel rays after refraction when light pass through focus.
    Ans: True
26. Concave lenses are used camera lenses.
    Ans: False. **Convex** lenses are used camera lenses.
27. Hypermetropia is corrected by using convex lens.
    Ans: True
28. Concave lens is used to correct hypermetropia.
    Ans: False. Concave lens is used to correct **myopia**.
29. The distance measured against the direction of incident light is taken as positive.
    Ans: True
30. The distance measure upward and perpendicular to the principal axis is taken as positive.
    Ans: False. The distance measured upward and perpendicular to the principal axis is taken as **negative**.
31. If magnification is greater than one diminished image will be obtained.
    Ans: False. If magnification is greater than one **enlarged** image will be obtained.
32. The power of the lens is the degree of convergence or divergence.
    Ans: True
33. The unit of power of the lens is m.
    Ans: Flase. The unit of power of the lens is **dioptre** or $\mathbf{m^{-1}}$**.**
34. Refractive index gives an idea about the velocity of light in a medium.
    Ans: True
35. Rayleigh's scattering is inelastic scattering.
    Ans: False. Rayleigh's scattering is **elastic** scattering.
36. The distance between optic centre and entre of curvature is called as 'focal length'.
    Ans: False. Focal length, of a lens is the distance of its principal focus form its pole.
37. Size of the image is proportiaonal to the visual angle.
    Ans: true
38. Concave lens is used as 'magnifying lens'.
    Ans: False. **Concex lens** is used as 'magnifying lens'.
39. The final image formed by the astronomical telescope is erect image.
    Ans: False. The final image is an **inverted image**.

IV. Match the following:

1. Retina	-	a) Path way of light
2. Pupil	-	b) Far point comes closer.
3. Ciliary muscles	-	c) Near point moves away
4. Myopia	-	d) Screen of the eye.
5. Hypermetropia	-	e) Power of accommodation.

Ans: 1-d; 2-a; 3-e; 4-b; 5-c

1. Object which give out light.	-	a) highest frequency
2. Object which emit their own light	-	b) highest wavelength.
3. Violet light	-	c) source
4. Red light	-	d) Luminous

Ans: 1-c; 2-d; 3-a; 4-b

1. Deviation of ray	-	a) Dispersion
2. Objects can be seen	-	b) Refraction
3. Splitting up of colours	-	c) Scattering of light
4. Blue colour of the sea	-	d)Reflection

Ans: 1-b; 2-d; 3-a; 4-c

1. Magnification	-	a) height / distance
2. Lens maker's formula	-	b) $\frac{1}{f}$
3. Power 'of a lens	-	c) height of the image /height of the object
4. Visual angle	-	d) $(\mu\text{-}1).\left[\frac{1}{R_1} - \frac{1}{R_2}\right]$

Ans: 1-c; 2-d; 3-b; 4-a

1. Protection of the internal parts of the eye	-	a) Iris
2. Refracts light	-	b) Sclera
3. Control the amount of light entering	-	c) pupil
4. Pathway of light	-	d) cornea

Ans: 1-b; 2-d; 3-a; 4-c

1. Diameter of the eye ball	-	a) less than 0.1 s
2. Refractive index of eye lens	-	b) infinity
3. Persistence of vision	-	c) 2.3 cm
4. Least distance of distinct vision	-	d) 1.437
5. Far point of distinct vision	-	e) 25 cm

Ans: 1-c; 2-d; 3-a; 4-e; 5-b

1. Myopia	-	a) long sightedness
2. Hypermeteropia	-	b) bifocal lens
3. Presbyopia	-	c) cylindrical lens
4. Astigmatism	-	d) short sightedness

Ans: 1-d; 2-a; 3-b; 4-c

Position of the object		**Position of the Image**
1. At infinity	-	a) Between F_2 and $2F_2$
2. Beyond $2F_1$	-	b) at $2F_2$
3. At $2F_1$	-	c) Beyond $2F_2$
4. Between F_1 and $2F_1$	-	d) Infinity
5. At F^1	-	e) F_2

Ans: 1-e; 2-a; 3-b; 4-c; 5-d

Instruments	**Type of lens used**
1. Simple Microscope	a) One Concave lens and one convex lens
2. Compound Microscope	b) One Convex lens
3. Astronomical	c) Three convex lenses
4. Terrestrial telescope	d) two convex lenses

Ans: 1- b; 2-d; 3-a; 4-c

V.A. Assertion and Reason:

Mark the corret choice as

a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) Assertion is true but reason is false.
d) Assertion is false but reason is true.

1. Assertion: If the refractive index of the medium is high (denser medium) the velocity of the light in that medium will be small.
   Reason: Refractive index of the medium is inversely proportional to the velocity of the light.
   Ans: a) Both assertion and reason are true and reason is the correct explanation of assertion.
2. Assertion: Myopia is due to the increase in the converging power of eye lens.
   Reason: Myopia can be corrected with the help of concave lens.
   Ans: b) Both assertion and reason are true but reason is not the correct explanation of assertion.

V.B Assertion and Reason:

Mark the corret choice as

a) If both assertion and reason are true and reason is the correct explanation of assertion.
b) If both assertion and reason are true but reason is not the correct explanation of assertion.
c) Assertion is true but reason is false.
d) both Assertion and reason is false.

3. Assertion: The air bubble shines in water.
   Reason: Air bubble in water shines due to refraction of light.
   Ans: c) Assertion is true but reason is false.
   Hint: Shines due to internal reflection.
4. Assertion: Blue colour of sky appears due to scattering of blue colour.
   Reason: Blue colour has shortes wavelength in visible light.
   Ans: a) Both assertion and reason are true and reason is correct explanation of assertion.
5. Assertion: During sun set, sun appears red.
   Reason: Scattering of light is directly proportional to the wavelength.
   Ans: c) Assertion is true but reason is false.
6. Assertion: A Convex lens (m = 1.5) has focal length 10 cm. When the lens is immersed in water ($\mu = \frac{4}{3}$) its focal length becomes 40cm.
   Reason: $\frac{\mu_1 - \mu_m}{\mu_m}\left[\frac{1}{R_1} - \frac{1}{R_2}\right]$
   Ans: a) Both assertion and reason are true and reason is correct explanation of assertion
7. Assertion: Wavelength of light does not depend on refractive index of medium.
   Reason: Different colours travel with different speed in vacuum.
   Ans: c) Assertion is true but reason is false.
8. Assertion: The stars twinkle while the planets do not.
   Reason: The stars are much bigger in size then the planets.
   Ans: b) Both assertion and reason are true but reason is not the correct explanation of assertion.
9. Assertion: The cloud in sky generally appears white.
   Reason: Due to diffraction clouds [The light is scattered by the water droplets inside the cloud]
   Ans: c) Assertion is true but reason is false.
10. Assertion: Diamond gliters brilliantly.
    Reason: Diamond does not absorb sunlight.
    Ans: a) Both assertion and reason are true and reason is correct explanation of assertion.
11. Assertion: There is an apparent change in frequency whenever there is a relative motion between a source & listener.
    Reason: In SONAR & RADAR use principle Doppler effect.
    Ans: b) Both assertion and reason are true but reason is not the correct explanation of assertion.

12. Assertion: The resolving power of a telescope is more if the diameter of the objective lens is more.
    Reason: Objective lens of large diameter collecets more light.
    Ans: a) Both assertion and reason are true and reason is correct explanation of assertion.
13. Assertion: Property of lens, whether the ray is converging or diverging is independenet of the surrounding medium.
    Reason: The converging property of a convex lens does not be same in all media.
    Ans: c) Assertion is true but reason is false.
14. Assertion: A convex lens made of two different materials. A point object is placed on the principle axis, two images will be formed by the lens.
    Reason: The image formed by convex lens is always 'virtual'.
    Ans: c) Assertion is true but reason is false.
15. Assertion: Bending of light rays from its original path at the interface of the two media is called 'Refraction'.
    Reason: Whenever the light travels from denser medium to rarer mediam, it bends away from the normal.
    Ans: a) Both assertion and reason are true and reason is correct explanation of assertion.

VII. Use the Analogy to fill in the blanks:

1. Blue: **shorter wavelength** ::Red : longer wavelength.
2. Deviation of light : **Refraction** :: Splitting of light : dispersion.
3. Biology: microscope :: Astronomy : **Telescope**
4. Scattering of light by gas molecules: Rayleigh scattering :: Scattering of light by dust : **Mie scattering**
5. Mercury vapour lamp: **White light** :: Sodium vapour lamp : monochromatic light.

VIII. Arrange the following in correct sequence:

1. Arrange the clours according to their wavelengths in ascending order.
   Orange, Indigo, Blue, Green
   Ans: Indigo, Blue, Green, Orange.
2. Arrange in order accordingly how a bulb gives out light waves.
   Transverse waves, Filament heated, Light energy, Electric current.
   Ans: Electric current, Filament heated, Light energy, Transverse waves.
3. Arrange the properties of light accordingly, when light travesl through any transpatent mediun.
   Diffraction, Dispersion, Reflection, Refraction
   Ans: Reflection, refraction, Dispersion, Diffraction.
4. Arrange in sequence, the steps to find the focal length of a convex lens.
   Measure the distance between lens and screen, find the focal length 'f', Focus the lens on a distance object, Adjust the screen to catch a clear image.
   Ans: Focus the lens on to a distant object, aduct the screen to catch a clear image, Measure the distance between lens and screen, find the focal length, f.

3. THERMAL PHYSICS

I. Choose the correct Answer:

1. The value of universal gas constant
   a) 3.81 mol^{-1} K^{1} b) 8.03 mol^{-1} K^{-1}
   c) 1.38 mol^{-1} K^{-1} **d) 8.31 mol^{-1} K^{-1}**
2. If a substance is heated or cooled, the change in mass of that substance is
   a) positive b) negative
   c) zero d) none of the above
3. If a substance is heated or cooled, the linear expansion occurs along the axis of
   a) X or –X b) Y or –Y
   c) both a & b d) a or b

4. Temperature is the average _____ of the molecules of a substance
   a) Difference in K.E and P.E b) sum of P.E and K.E
   c) difference in T.E and P.E d) difference in K.E and T.E
5. In the given diagram, the possible direction of heat energy transformation is

   a) A← B, A←C, B←C b) A→B, A→C, B→C
   c) A→B, A←C, B→C d) A←B, A→C, B←C
6. Which of the following has the fastest process of heat transfer?
   a) Conduction b) convection
   c) Radiation d) all the above
7. At what temperature are Celsius and Fahrenheit equal?
   a) 40° **b) -40°**
   c) 0° d) 100°
8. In which process heast is transferred directly from one molecule to other?
   a) conduction b) convection
   c) radiation **d) all the above**
9. Temperature is a property which determines
   a) amount of heat a body contains b) total absolute energy a body has
   c) direction of flow of heat d) thermal energy
10. SI unit of temperatue is
   a) Celsius b) Fahrenheit
   c) Kelvin d) none
11. SI unit of heat is
   a) calorie **b) joule**
   c) kilo calorie d) Kelvin
12. All the substances will undergo the following changes like _____ when heated.
   a) increase the temperature b) expansion of substance
   c) change of state **d) all the above**
13. Thermal expansion at particular temperature is less in
   a) solid b) liquid
   c) gas d) all above
14. Increase in area due to heating is called
   a) linear expansion **b) superficial expansion**
   c) cubical expansion d) real expantion
15. Change in volume of a solid during heating is
   a) linear expansion b) Superficial expansion
   c) Cubical expansion d) apparent expansion
16. Linear expansion is the change in _____ when object is heated or cooled.
   a) length b) area
   c) volume d) density
17. Fundamental laws of gases are
   a) Boyle's law b) Charles's law
   c) Avogadro **d) all the above**
18. at constant temperature volume is inversely proportiaonl to pressure of a gas is known as

a) Boyle's law b) Charles's law
c) Avogadro d) none

19. According to Charles's law
a) P α $\frac{I}{V}$ **b) V α T**
c) V α n d) all the above
20. Gas laws state the relationship between _____ properties of gas.
a) pressure b) volume
c) temperatue & mass **d) all the above**
21. SI unit of temperature is _____
a) K b) ^oC c) I^oC d) ^oF
22. The unit of coefficient of real expansion is
a) K b) ^oC **c) K^{-1}** d) ^oF
23. The formula for conversion of temperature from Kelvin to Celsius is
a) C = K +73 **b) C= K-273**
c) C=K+460 d) C=K-460
24. If the atoms or molecules of a gas do not interact with each other, then the gas is said to be in _____
a) inert gas **b) ideal gas**
c) imperfect gas d) pure gas
25. The degree of hotness or coldness of a body is called _____
a) energy b) thermal energy
c) temperature d) heat capacity
26. Charles's law is also called as _____
a) the law of temperature b) the law of pressure
c) the law of volueme d) the law of gas
27. Absolute scale is also called as _____
a) Kelvin scale b) Celsius scale
c) Cnetrigrade scale d) Fahrenheit scale
28. The amount of heat energy required to rise the temperature of 1 gram of water through 1^oC is _____
a) one kilo calorie b) one joule
c) one Kelvin **d) one calorie**
29. The value of universal gas constant is _____
a) 8.21 J $mol^{-1}K^{-1}$ b) 8.27 J $mol^{-1}K^{-1}$
c) 8.31 J $mol^{-1}K^{-1}$ d) 8.31 J $mol^{-1}K^{-1}$
30. Thermal conduction in metal is due to
a) free electorns b) bound electorns
c) vibration of molecules **d) vibration of atoms**

II. Fill in the blanks:

1. The value of Avogadro number **6.023 x10^{23} / mol (or) mol^{-1}**
2. The tempeatue and heat are **Scalar** quantities.
3. One calorie is the amount of heat energy required to raise the temperature of **1 gm** of water through **1^oC.**
4. According to Boyle's law, the shape of the graph between pressure and reciprocal of volume is **straight line**.
5. The average Kinetic energy of the molecules of a substance is called **temperature**.
6. The SI unit of temperature is **Kelvin**.
7. Temperature is an indication of the **average kinetic energy** of molecules.
8. The relation between Celsius to Kelvin **K=C+273**

9. If there is flow of thermal energy between the systems, then they are in **thermal equilibrium**.
10. Transfer fo thermal energy from one object to another is called **heating**.
11. Hotness or coldness of an object is called **temperature**.
12. The process of heat transfer directly from molecule to molecule is called **conduction**.
13. Transfer of energy between any two objects due to difference in temperature is called **thermal (or) heat energy**.
14. Heating is the process in which heat energy flows from **higher** temperature to **lower** temperature objects.
15. The SI unit of heat energy is **joule**.
16. Transfer of heat energy from low temperature to high temperature object is called **cooling**.
17. The amount of heat required to raise 1°C of 1g of water is **1 calorie**.
18. Change in dimension due to raise in temperature is called **thermal expansion**.
19. The expansion of solids is **small** due to their rigid property.
20. The expansion is **small** in solids due to rigid nature.
21. If there is change in length due to heating, it is called **linear expansion**.
22. Superficial expansion is increase in **area** due to heating.
23. Because of heating, if there is change in volume it is called **cubical expansion**.
24. **Liquid** has more expansion than solids due to rise in temperature.
25. The unit of coefficient of real expansion is **K^{-1}**
26. Ratio of true rise in volume to original volune of liquid due to rise in temperature of 1K is called **coefficient of real expansion.**
27. Coefficient of cubical expansion of liquid is independent of **temperature**.
28. Coefficient of cubical expansion is equal to **three** times of coeeficient of linear expansion.
29. According to Avogadro's law, the volume fo gas is directly proportional to **number of atoms**.
30. The total number fo atoms per mole of the substance is **Avogadro's number**.
31. The value of Avogadro number **6.023×10^{23} / mol (or) mol^{-1}**
32. If the molecules or atoms of gases interact with each other with a definite amount of interatomic force of attraction, then the gases are solid to be **real** gases.
33. At very **high** temperature and **low** pressure, real gas behaves as an ideal gas.

III. State whether the following statements are true or false. If false explain why?

1. For a given heat in liquid, the apparent expansion is more than that of real expansion.
   Ans: False. The real expansion is **more (or) less** than that of apparent expansion.
2. Thermal energy always flows from a system at higher temperature to a system at lower temperature.
   Ans: True.
3 According to Charles's law, at constant pressure the temperature is inversely proportiaonl to volume.
   Ans: False. Volume is **directly proportional** to temperature at constant pressure.
4. Temperature is a vector quantity.
   Ans: False. Temperature is **a scalar** quantity.
5. The Si Unit of heat energy absorbed or evolved is Kelvin.
   Ans: False. The SI unit of heat energy absorbed or evolved is **Joule**.
6. Heat energy flows from high temperature to low temperature.
   Ans: True
7. If heat is given to a body, the work doen is said to be negative.
   Ans: False. If heat is given to a body, the work done is said to be **negative**.
8. By convention, the work done is taken as +ve, when the heat is given to a body.
   Ans: True
9. Cooling is transfer of heat energy from the body at higher temperature to lower temperature.

Ans: False. Cooling is transfer of heat energy from the body at **lower temperature to higher temperature**.

10. Heat gained by the body is not equal to heat lost by the hotter system.
    Ans: False. Heat gained by the body **is equal** to heat lost by the hotter system.
11. Amount of heat required to rise the temperature of 1g of water through 1°C is 1 joule.
    Ans: False. Amount of heat required to rise the temperature of 1g of water through 1°C is 1 **calorie**.
12. The rise in temperature is inversely proportional to the amount of heat energy supplied.
    Ans: False. The rise in temperature is **directly** proportional to the amount of heat energy supplied.
13. When heat energy is supplied there is decrese in dimension of the object which is called thermal expansion.
    Ans: False. When heat energy is supplied there is **increase** in dimension of the object called thermal expansion.
14. At constant temperatue the pressure is proportional to volume.
    Ans: False. At constant temperatue the pressure is **inversely** proportional to volume.
15. At constant pressure volume is proportional to temperature is known as Boyle's law.
    Ans: false. At constant pressure volume is proportional to temperature is known as **Charles's law**.
16. Total number of atoms per mole is 6.023×10^{23}.
    Ans: True
17. Ideal gases obey Charles, Boyle's and Avogadro's laws.
    Ans: True
18. Ideal gas equation is called equation of state.
    Ans: True
19. V.n = Constant is Avogadro's law.
    Ans: False. V/n = constant is Avogadro's law.
20. PV/nT= a constant is called as equation of state.
    Ans: False. It is called the combined law of gases.
21. Solid, liquid and gas undergo condensation on heating.
    Ans: False. They undergo **expansion** on heating.
22. The unit of Avogadro's number is per mole or / mol.
    Ans: True
23. Ideal gases do not obey Avogadro's law.
    Ans: False. They **obey** Avogadro's law.
24. The realtion between Celsius and Kelvin is K= C+273.
    Ans: True
25. Zero Kelvin is equal to 273°C.
    Ans: False. Zero Kelvin is equal to -273°C.

IV. Match the following:

1. Linear expansion	-	a) Change in volume
2. Superficial expansion	-	b) hot body to cold body
3. Cubical expansion	-	c) 1.381×10^{-23} JK^{-1}
4. Heat transformation	-	d) Change in length
5. Boltzmann constant	-	e) change in area

Ans: 1-d; 2-e; 3-a; 4-b; 5-c

1. Heat is taken out of the body	-	a) Positive
2. Heat is given to a body	-	b) Joule
3. Heat energy	-	c) Nature of mass of the substance.
4. Rise in temperature	-	d) negative

Ans: 1-d; 2-a; 3-b; 4-c

1. Boyle's law - a) PV= RT
2. Charle's law - b) PV= constant
3. Avogadro's law - c) V/T = constant
4. Ideal gas equation - d) Vα n

Ans: 1-b; 2-c; 3-d; 4-a

1. Linear expansion - a) expansion of liquid only
2. Superficial expansion - b) Change in length
3. Cubical expansion - c) increase in area
4. Real expansion - d) increase in volume

Ans: 1-b; 2-c; 3-d; 4-a

1. Temperature - a) bodies at same temperature
2. Heat - b) convection
3. Tehrmal equilibrium - c) energy
4. Transmission of heat - d) degree of hotness.

Ans: 1-d; 2-c; 3-a; 4-b

1. SI unit of a temperature - a) mole
2. SI unit of heat energy - b) kelvin
3. Coefficient of expansion - c) joule
4. Mass of substance - d) K^{-1}

Ans: 1-b; 2-c; 3-d; 4-a

V.A. Assertion and Reason:

a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
b) Both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but the reason is false.
d) Assertion is false but the reason is true.

1. Assertion: There is no effect on other end when one end of the rod is only heated.
   Reason: Heat always flows from a region of lower temperature to higher temperature of the rod.
   Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion
2. Assertion: Gas is highly compressible than solid and liquid.
   Reason: Interatomic or intermolecular distance in the gas is comparably high.
   Ans: c) Assertion is true but the reason is false.

V.B. Assertion and Reason:

a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
b) Both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true but the reason is false.
d) Both assertion and reason are false.

3. Assertion: Temperature is the average kinetic energy of the molecules of a substance.
   Reason: Temperature determines the flow of heat.
   Ans: b) Both assertion and reason are true but reason is not the correct explanation of the assertion.
4. Assertion: Transmission of heat takes place in the Conduction, Convection and Radiation.
   Reason: Heat can be transferred from higher temperature to lower temperature.
   Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion
5. Assertion: The process of transferring heat energy from lower temperature to higher temperature is called cooling.
   Reason: the mass of the system is not altered when it is cooled.

Ans: b) Both assertion and reason are true but the reason is not the correct explanation of the assertion.

6. Assertion: For any exchange of heat, heat is gained by cold system is not equal to the heat lost by hotter system.
   Reason: P α T
   Ans: d) Both assertion and reason are false.
7. Assertion: Fahrenheit is the smallest unit to measure temperature.
   Reason: Fahrenheit was the first temperature scale used for measuring temperature.
   Ans: a) Both assertion and reason are true and reason is correct explanation of the assertion
8. Assertion: The coefficient of columetric expansion has unit K^{-1}.
   Reason: The coefficient of cubical expansion is equal to $\frac{\Delta V}{V \Delta T}$
   Ans: a) Both assertion and the reason are true and reason is correct explanation of assertion
9. Assertion: A beaker is completey filled with water at 4°C. It will overflow when heated or cooled.
   Reason: There is expansion of water below & above 4°C.
   Ans: b) Both the assertion and reason are true but reason is not the correct explanation of the assertion.
   Hint: Above or below 4°C, density of water decreases & volume increases.
10. Assertion: Two bodies at different temperature, if brought in contact both will be in mean temperature.
    Reason: The two bodies are made of different materials.
    Ans: c) Assertion is true but the reason is false.
    Hint: When two bodies T_1 & T_2 are broguth in contact they settle in mean temperature. $\left[\frac{T_1+T_2}{2}\right]$ only if the bodies are of same mass & material.

VI. Arrange Solid, Liquid and Gas in the following order:

1. Effect of pressure in decreating order **Gas, Liquid, Solid.**
2. Interatimic space in increasing order **Solid, Liquid, Gas.**
3. Thermal expansion in decreasing order **Solid, Liquid, Gas**.

VII. Use the Analogy to fill in the blanks:

1. Linear expansion: longitudinal expansion :: superficial expansion : **Arial expansion.**
2. $\frac{V}{n}$ = constant : **Avogadro's law** :: $\frac{V}{T}$ = constant : Charles's law.
3. Ideal gas equation: equation of state :: Law of volume : **Charles's law**
4. 1.38×10^{-23} JK^{-1} : Boltzmann consant :: **8.31 J mol^{-1} K^{-1}**
5. 1 Kcal : Heat requreid :: Joule: **work done**.
6. Real gas: Atoms interact with each other :: **Ideal gas** do not interact with each other.

VIII. Arrange the following in correct sequence:

1. Write in order, the different scales of temperature used from the beginning period to till now.
   Kelvin scale, Rankine sale, Celsius scale, Fahrenheit scale
   Ans: Fahrenheit scale, Celsius scale. Kelvin scale, Rankine scale
2. Write the co-efficient of cubical expansions of the materials given below in ascending order.
   Mercury, Glass, Brass, Aluminium
   Ans: Glass, Brass, Aluminium, Mercury
   Note: Glass → $2.5 \times 10^{-5}(K^{-1})$
   Brass → 6×10^{-5} (K^{-1})
   Aluminium → 7×10^{-5} (K^{-1})
   Mercury → 18.2×10^{-5} (K^{-1})
3. Four states of matter, arrange in sequence.

Plasma, Gas, Solid, Liquid
Ans: Solid, Liquid, Gas, Plasma.

4. ELECTRICITY

I. Choose the correct answer:

1. Which of the following is correct?
   a) Rate of chance of cliarge is electrical power
   b) Rate of change of charge is current
   c) Rate cit change of energy is current
   d Rate of change of current is charge.
2. Si unit of resistance is
   a) mho b) joule
   c) ohm d) ohm meter
3. In a simple circuit, why does the bulb glow when you close the switch?
   a) The switch produces electricity
   b) Closing the switch completes the circuit
   c) Closing the switch breaks the circuit
   d) The bulb is getting charged
4. kilowatt hour is the unit of
   a) resistivity b) conductivity
   c) electrical energy d) electrical power
5. A series circuit consists of three resistors with values of 140, 250 and 220. The total resistance is.
   a) 330 **b) 610** c) 720 d) None of the above
6. When will be the current flow in a circuit?
   a) A switch is closed b) A switch is opened
   c) Switch is either open or closed d) None of the above
7. When one of three series resistors is removed from a circuit and the circuit is reconnected the current
   a) increase by half **b) increases**
   c) decreases by half d) none of the above
8. The SI unit of power is
   a) joule b) ampere
   c) watt d) ohm
9. A parallel circuit consists of three resistors with values of 430, 210 and 100. The total resistance is
   a) 0.017 ohm **b) 58.82 ohm**
   c) 58.82 kilo ohm d) None of the above
10. According to Ohm's law if voltage increases and resistance stays the same
    a) Resistance decreases **b) Current increases**
    c) Current remains the same d) Current decreases
11. The amount of work done in joules when one unit electric charges moves from one point to another point in an electric circuit is called.
    a) Resistance **b) Potential difference**
    c) Current d) charge
12. The resistance of material depends on.
    a) Temperature b) Length of conductor
    c) Area of cross-section **d) All the above**
13. The relation between potential difference (V) and current (I) is:
    a) $V \alpha I$ b) $V \alpha I^2$ c) $V \alpha \frac{I}{I}$ **d) None of the above**
14. The relation between potential difference (V) and current (I) was discovered by:

a) Volt **b) Ohm**
c) Newton d) Ampere

15. Give the name of components which is designed to oppose the flow of current.
a) Capacitor **b) Resistors**
c) Fuse wire d) Inductor

16. The resistance of a conductor directly proportional to
a) Length b) Area
c) Volt d) Current

17. Which of the following laboratory apparatus is used during the verification of Ohm's law?
a) Voltmeter b) Ammeter
c) Rheostat **d) All the above**

18. Kilowaft - hour is the unit of
a) Power b) Potential difference
c) Force **d) Electrical energy**

19. If resistance decreases, then current will
a) increase b) double
c) decrease d) constant

20. The resistance of a conductor is inversely proportional to its _____
a) Volt b) Length
c) Area (d) None of the above

21. Why battery is used in the circuit?
a) Measure Current **b) Maintain a potential difference**
c) Oppose the current d) Measure potential

22. Conductance is expressed in terms of:
a) mho b) ohm/rn
c) ohm d) rnho/rn

23. What happens when ammeter connected in parallel?
a) Open circuited b) Closed Circuited
c) Short circuited d) None of the above

24. If two unequal resistors connected in parallel then.
a) The voltage is same in both resistor b) The current is same in both resistor
(c) The voltage is larger in one of the resistor (d) The current is large in one of the resistor

25. What does a switch do?
a) Oppose the current **b) Open and close the circuit**
c) Provide current d) Store the energy.

26. If there are two bulbs i.e 150W bulb and 60W bulb so which has more resistance?
a) 60W b) 150W
c) Both a and b d) None of the above

27. If resistance of a wire is r ohms and wire is stretched to double its length, then what is its resistance?
a) r b) 2r **c) 4r** d) r/2

28. In parallel comnination, resistance decrease due to increase in
a) area of cross section b) voltage
c) length **d) current**

29. The device which easily closes or opens an electric circuit is called as
a) switch b) cell
c) key d) bulb

30. A small wire present inside the bulb is called
a) conductor **b) filament**

c) insulator d) none of the above

31. if one of the resistors in a parallel circuit is removed, the total resistance will be
    a) doubled b) decreases
    c) increases d) constant
32. All good conductors have high
    a) resistance b) specific resistance
    c) voltage **d) none of the above**
33. A short circuit has
    a) Non resistance b) no conductance
    c) low current **d) none of the above**
34. What happens to current and resistance if the voltage is doubled?
    a) current doubles and resistance doubles
    b) current doubles and resistance is halved
    c) currnet remains the same and resistance doubles
    d) current doubles and resistance remains the same.
35. If the resistance in a series circuit doubles, total current will be
    a) doubles **b) halved**
    c) same d) increases
36. Which is considered to be the common reference for a parallel circuit?
    a) current b) resistance
    c) power **d) voltage**
37. Why are copper wires used as connecting wires?
    a) low resistivity b) low conductivity
    c) high resistivity d) both a & b
38. Direction of conventional current is from
    a) negative terminal to positive terminal b) in both the directions
    c) positive terminal to negative terminal d) none of the above.
39. Conductivity is the _____ od resistivity.
    a) opposite **b) reciprocal**
    c) equal d) none of the above
40. 1 Ampere is given as
    a) 1C x 1s **b) 1 C /1 s**
    c) 1s/ 1C d) None of the above
41. Which of the following relation is correct for voltage, work done and charge?
    a) V= W xQ **b) W = V x Q**
    c) V= Q1W d) W= V/Q
42. A complete electric circuit is called as
    a) open b) short
    c) closed d) complete
43, How many terminals an electric bulb consist of?
    a) 2 b) 4 c) 3 d) 1
44. Fuse wire
    a) low melting point b) has high resistance
    c) has low resistance **d) both (a) & (b)**
45. Which of the following produces large joule heating effect?
    a) 1A current through 2Ω resister for 3 seconds
    b) 1A current through 3 Ω resistor for 2 seconds
    c) 2A current through 1Ω resistor for 2 seconds

d) 3A current through 1Ω resistor for 1 second

46. The heat produced in time is

a) H= $\frac{V}{It}$ b) $\frac{t}{VI}$ =H **c) H=VIt** d) H= $\frac{I}{Vt}$

47. The expression for the heat is

a) H = VIt b) H = I^2Rt c) H= = $\frac{V^2}{R}$t **d) all the above**

48. According to Joule's heating effect, the law of current is

a) I α H^2 **b) H α I^2** c) H α I d) both (b) and (c)

49. Electric iron box and electric heater works on the principle of

a) heating effect of current b) heating effect of voltage

c) heating effect of power d) heating effect of emf

50. A heating element used in the electric iron box and the electric heater is

a) Tungsten **b) Nichrome**

c) Lead d) All the above

51. In which one of the following heating effect the current is undesirable?

a) electric iron **b) electric motor**

c) fuse wire d) electric bulb

52. Choose the correct statement

a) Nichrorne has low resistance and high melting point

b) Fuse wire has high resistance and low melting point

c) Nichrorne has high resistance and iow melting point

d) Fuse wire has low resistance and high melting point

53. A 110 W, 220 V bulb draws a current.

a) 2A b) 440A **c) 0.5A** d) 5.5A

54. A bird sitting on an uninsulated wire carrying a current feels quite safe because

a) the bird is non-conductor of electricity

b) resistance of the bird is very large

c) there is a large potential difference between bird and wire

d) there is no potential difference between bird and wire

55. The number of electrons in one coulomb of charge is

a) 1.6 x $i0^{19}$ **b) 6.25 x 10^{18}**

c) 1.13 x 10^{11} d) 8.85 x 10^{12}

56. A compete electric circuit is called _____ circuit.

a) open **b) closed**

c) compelte d) none ot these

57. The electric current in a closed circuit always flows from the _____ terminal of the electric cell to ____ terminal.

a) –ve to +ve **b) +ve to –ve**

c) +ve to +ve d) none

II. Fill in the blanks:

1. When a circuit is open, **current** cannot pass through it.
2. The ratio of the potential difference to the current is known as **resistance**.
3. The wiring in a house consists of **parallel** circuits.
4. The power of an electric device is a product of **voltage and current**.
5. LED stands for **Light Emitting Diode**
6. Electricty deals with the flow of **charges** through a conductor.
7. Current passes from **higher** potential to the **lower** poetential.
8. SI unit of current is **ampere**.

9. One coulomb of charge has **6.25 x 10^{18}** electrons.
10. The device used to measure electric current is **ammeter**.
11. The purpose of a rheostat is **to vary the magnitude of current** .
12. The direction of currnet is as the direction of flow of **+ve charge**.
13. The amount of work doen to move charge from one point to another is called **potential**.
14. Unit of electric potential is **volt**.
15. The hindrance presented by material of conductor to the smooth passing of current is **resistenace**.
16. Point to be kept in mind for verification of ohm's law is ammeter should be connected in **series** and voltmeter in **parallel**.
17. When a 40V battery is connected across an unknown resistance, there is a current of 100 mA in the circuit. The value of resistance is **R=** $\frac{V}{I} = \frac{40}{100x10^{-3}} = 400\Omega$
18. The resistance of a conductor is directly propoertiaonl to **length of the conductor**.
19. Nichrome is an alloy of **Nickel and Chromium.**
20. The graph between V and I is **straight line** for a conductor.
21. **Resistance** of a material which oppose the flow of currnet in a conductor.
22. Resistance is **different** for different materials.
23. When the current is doubled, the area of cross section is **doubled**.
24. When the length of the conductor is doubled, the courrent becomes **one half of the initial value**.
25. A conductor with hightest resistance is used in **making heating elements**.
26. The reciprocal of resistance is **conductance**.
27. Resistivity is **constant** for a given material.
28. The unit of specific resistance is **mho m**
29. Conductivity is **more** for conductors than insulators.
30. **Potential difference** is represented by joule/coulomb.
31. Resistance is used to fix the magnitude of **current**

III. State whether the following statements are True or False: If false correct the statement.

1. Ohm's law states the relationship between power and voltage.
   Ans: False. Ohm's law states the relationship between **current and voltage**.
2. MCB is used to protect house hold electrical appliances.
   Ans: True.
3. The SI unit for electric current is the coulomb.
   Ans: False. The SI unit for electric current is the **ampere**
4. One unit of electrical energy consumed is equal to 1000 kilowatt hour.
   Ans: False. One unit of electrical energy consumed is equal to **1 kilowatt hour**
5. The effective resistance of three resistors connected in series is lesser than the lowest of the individual resistances.
   Ans: False. The effective resistance of three resistors connected in series is **greater than** the highest of the individual resistances.
6. Electric power is the rate of consumption of electrical energy.
   Ans: True
7. Resistance of the wire is inversely proportional to length of the wire
   Ans: False. Resistance of the wire is **directly** proportional to the length.
8. A thin wire has less resistance than the thick wire of same length and same material
   Ans: False. A thin wire has **high** resistance than the thick wire of same length and same material.
9. Series arrangement is used in domestic circuits.
   Ans: False. **Parallel** arrangement is used in domestic circuits
10. The graph between V and I is a straight line.

Ans. True.

11. Conductance is the property of the material to oppose the flow of charges.
    Ans: False. **Resistance** is the property of the material to appose the flow of charges.
12. The unit of electric potential is ohm
    Ans: False. **Volt** is the unit of electric potential.
13. One micro ampere is equal to 10^{-3} A.
    Ans: False. One micro ampere is equal to **10^{-6} A**.
14. The potential difference required for the flow of charges is provided by the voltmeter.
    Ans: False.The potential difference required for the flow of charges is provided by **the battery**.
15. Rheostat is also called as a variable resistor.
    Ans: True.
16. In an ammeter device the terminal (Red) which has higher potential is called positive terminal.
    Ans. True.
17. Nichrome is an alloy of lead and chromium.
    Ans: False. Nichrome is an alloy of **nickel and chromium**.
18. George Simon Ohm invented electrochemical cell.
    Ans: False. Alessandro Volta invented electrochemical cell.
19. A fuse wire is made up of an alloy of tin and lead.
    Ans: True.
20. Specific resistance is also called as electrical resistivity.
    Ans: True
21. Tesla Invented lightning conductor
    Ans: False. **Benjamin Franklin** invented lightning conductor.

IV. Match the items in column -I to the items in column-II:

1. Electric current	-	a) volt
2. Potential difference	-	b) ohm meter
3. Specific resistance	-	c) watt
4. Electric power	-	d) joule
5. Electrical energy	-	e) ampere

Ans: 1-e; 2-a; 3-b; 4-c; 5-d

1. Potential difference	-	a) $\frac{1}{p}$
2. Electric current	-	b) $\frac{V}{I}$
3. Conductivity	-	c) $\frac{W}{Q}$
4. Resistance	-	d) $\frac{Q}{t}$
5. Power	-	e) VI

Ans: 1-c; 2-d; 3-a; 4-b; 5-e

1. Fix the magnitude of the current in the circuit	-	a) Ammeter
2. Current	-	b) Galvonometer
3. Direction of current	-	c) Ground connection
4. Potential difference	-	d) Resistor
5. Protection to the electrical components	-	e) Voltmeter

Ans: 1-d; 2-a; 3-b; 4-e; 5-c

1. George Simon Ohm	-	a) Lightning conductor
2. Alessandro Volta	-	b) Ohm's Law
3. James Prescott Joule	-	c) LED TV
4. James P.Mitchell	-	d) Nature of heat

5. Benjamin Franklin - e) Electrochemical cell

Ans: 1 – b; 2-e; 3-d; 4- c; 5- a

1. LED bulb - a) Tungsten
2. Earth wire - b) Heating device
3. MCB - c) Third wire
4. Filament - d) Fuse wire
5. Geyser - e) Semiconductor

Ans: 1- e; 2 – c; 3 – d; 4 - a; 5 - b

1. Resistivity (p) - a) $\frac{1}{R_{S1}} + \frac{1}{R_{S2}}$
2. Electrical power (P) - b) $\frac{RA}{I}$
3. Amount of heat in any resistor (H) - c) $(R_{p1} + R_{p2})$
4. Parallel connection of series resistors - d) $\frac{V^2 t}{R}$
5. Series connetion of parallel resistors - e) I^2R

Ans: 1-b; 2-e; 3-d; 4-a; 5-c

1. Electric currnet - a) Conductivity
2. Relation between potential difference and current. - b) I^2Rt
3. Reciprocal of resistivity - c) 746 watt
4. Joule's law - d) $\frac{Q}{t}$
5. One horse power - e) ohm's law

Ans: 1-d; 2-e; 3-a; 4-b; 5-c

V. Assertion and Reason:

Mark the correct choice as

a) If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

b) If both the assertion and the reason are true, but the reason is not the correct explanation of the assertion.

c) If the assertion is true, but the reason is false.

d) If the assertion is false, but the reason is true.

1. Assertion: Electric appliances with a metallic body have three wire connections.
   Reason: Three pin connections reduce heating of the connecting wires
   Ans: c) The assertion is true, but the reason is false.
2. Assertion: In a simple battery circuit the point of highest potential is positive terminal of the battery.
   Reason: The current flows towards the point of the highest potential.
   Ans: c) The assertion is true, but the reason is false.
3. Assertion: LED bulbs are far better than incandescent bulbs.
   Reason: LED bulbs consume less power than incandescent bulbs.
   Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
4. Assertion: The Kinetic energy of the electrons increases when ternperature ol the wire increases.
   Reason: An increasing temperature conductivity of metallic wire decreases.
   Ans: b) Both the assertion and the reason are true, but the reason is not the correci explanation of the assertion.
5. Assertion: In a simple battery, the point of lowest potential is +ve terminal of the battery.
   Reason: The current flows to higher potential as to lower potential.
   Ans: d) The assertion is false but the reason is true.
6. Assertion : Bending a wire does not affect electrical resistance.

Reason : Resistance ofwire is proportional to resistivity of material.

Ans: a) Beth the assertion and the reason are true and the reason is the correct explanation of the assertion.

7. Assertion: Current is a scalar quantity.
   Reason: Current is due to continuous flow of charges.
   Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
8. Assertion: An ammeter is always connected in series whereas a voltmeter is connected in parallel.
   Reason : An ammeter has a low resistance while voltmeter has high resistance.
   Ans: b) Both the assertion and the reason are true. But the reason is not the correct explanation of the assertion.
9. Assertion: When a wire is not connected to battery, no current flows.
   Reason: Charge does not flow in particular direction.
   Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
10. Assertion: A voltmeter must be connected in parallel and should have a high resistance.
    Reason: The introduction of the voltmeter in the circuit must not affect the potential difference.
    Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
11. Assertion: In parallel combination of electrical appliances, the total power consumption is equal to the sum of powers of the individual appliances
    Reason: Charges move from higher potential to lower potential.
    Ans: b) Both the assertion and the reason are true. But the reason is not the correct explanation of the assertion.
12. Assertion: In a series combination of electric bulbs, the bulb of 30 watts emits more light than that of lower bulbs.
    Reason: The 30W bulb in series gets more current than low power bu1bs.
    Ans. c) The assertion is true, but the reason is false.
13. Assertion: Two resistors connected in series, the total resistance is greater than the highest of the individual resistance.
    Reason: In series connection current in each resistor is same.
    Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
14. Assertion: The effective resistance in a parallel combination is less than the series.
    Reason : The potential difference across each resistance is same.
    Ans: d) The assertion is false but the reason is true.
15. Assertion: In series, one appliance is disconnected others also do not work.
    Reason: Current cannot pass in this case.
    Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
16. Assertion: Overloading happens when a large no. of app1iarices are connected in series.
    Reason: All the electric points are connected in parallel in the domestic circuit.
    Ans: b) Both the assertion and the reason are true. But the reason is not the correct explanation of the assertion.
17. Assertion: When a large current passes through the circuit the fuse wire melts due to joules heating effect.
    Reason: Fuse wire has low melting point and high resistance.

Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.

18. Assertion: LED bulb is a semi condcuctor device that emits visible light when an electric current passes through it .
    Reason: LED television is one of the most important applications of light emitting diodes.
    Ans: b) Both the assertion and the reason are true. But the reason is not the correct explanation of the assertion.

VI. Use the Analogy to fill in the blanks:

1. AC: reverses direction :: DC : **one direction**.
2. Conductivity : degree of conductance :: **Resistance**: measure of resisting power.
3. Resistivity; ohm :: Conductivity : **$mho.m^{-1}$**
4. Conductors: less resistivity :: **Insulators** : more resistivity.
5. $R_p : \frac{R}{n} : R_s$: **nR**
6. Series : high resistance :: parallel: **less resistance**
7. Heating effect : Nichrome :: filament : **Tungsten**
8. Electric power : hp :: Electric energy **: 1 unit (or) 1KWh**
9. Overloading : excess current :: **Short circuit**: contact of wires.
10. MCB : **disconnect the circuit** :: earthing : connecting to ground
11. Electric oven: Nichrome :: bulb : **Tungsten**.
12. Ammeter: series :: Voltmeter: **Parallel**
13. Resistor : fix the magniture or current :: **Rheostat** : select the magnitude of current.
14. Voltmeter: potential difference :: **Galvanometer** : direction of current.
15. Series connection of resistance: effect resistance is more:: Parallel connection of resistance : **effect resistance is less.**
16. Charge : Coulomb :: current : **Ampere**
17. Ohm's Law: resistance :: Joule's Law : **Healing effect (or) heat**.
18. $H:I^2rt$ :: P :VI:**P**
19. Ampere : electric current :: **Electric potential**: Volt.
20. Heating element: **Nichrome** :: Fuse wire: lead and tin.
21. Vi: P :: V: **IR**
22. Voltage x change : **Work** :: Current x time : charge.

VII. Arrange the following in a correct order:

1. Arrange the words in a correct order of functioning.
   Load (bulb), wire and battery, voltage current.
   Ans: Wire and battery, Voltage, Current, Load (Bulb)
2. Arrange the materials according to their resistivity in
   Chromuim, Copper, Nickel, Glass
   Ans: Copper, Nickel, Chromium, Glass
   Note: Copper - $1.62 \times 10^{-1} \Omega m$,
   Nickel - $6.84 \times 10^{-8} \Omega m$,
   Chromium - $12.9 \times 10^{-1} \Omega m$,
   Glass - $10^{14}\ \Omega m$,

5. ACOUSTICS

I. Choose the correct answer:

1. When a sound wave travels through air, theair particles
   a) vibrate along the direction of the wave motion
   b) vibrate but not in any fixed direction

c) vibrate perpendicular to the direction of the wave motion
d) do not vibrate

2. Velocity of sound in a gaseous medium is 330 ms^{-1}. If the pressure is increased by4 times without causing a change in the temperature, the velocity of sound in the gas is
   a) 330 ms^{-1} b) 660 ms^{-1}
   c) 156 ms^{-1} d) 990 ms^{-1}
3. The frequency, which is audible to the human ear is
   a) 50 kHz **b) 20 kHz**
   c) 15000 kHz d) 10000 kHz
4. The velocity of sound in air at a particular temperature is 330 ms^{-1}. What will be its value when temperature is doubled and the pressure is halved?
   a) 330 ms^{-1} b) 165 ms^{-1}
   c) 330 x √2 ms^{-1} d) 320 x √2 ms^{-1}
5. If a sound wave travels with a frequency of 1.25 x 10^4 Hz at 344 m S^{-1}, the wave length will be
   a) 27.52m b) 275.2m
   c) 0.02752 m d) 2.752 rn
6. The sound waves are reflected from an obstacle into the same medium from which they were incident. Which of the following changes?
   a) speed b) frequency
   c) wavelength **d) none of these**
7. Velocity of sound in the atmosphere of a planet is 500 ms^{-1}. The minimum distance between the sources of sound and the obstacle to hear the echo, should be
   a) 17m b) 20m **c) 25m** d) 50m
8. Which statement is true?
   a) Sound waves can propagate as longitudinal or transverse depending on the transmiting meium.
   b) Sound waves are transverse and they propagate perpendicular to the transmitting medium.
   c) Sound waves are longitudinal waves and they propagate parallel to the transmitting medium.
   d) Sound waves can propagate as longitudinal or transverse depending on the temperature.
9. The velocity of sound in gases is affected by
   a) temperature b) density
   c) relative humidity **d) all the above**
10. A sound wave passes through gold rod and comes into the surrounding air. What is the relation between original wavelength λ and new wavelength λ`?
    a) λ = λ` **b) λ > λ`**
    c) λ< λ` d) Noneoftheabove
11. At what velocity should a source of sound move towards a listener so that apparent frequency is twice the actual frequency?
    a) 165 m/s b) 330 rn/s
    c) 660m/s d) 110 m/s
12. The region of a sound wave having low pressure is
    a) interference b) refraction
    c) rarefaction d) compression
13. A car playing music at a frequency of 250Hz moves at 20 m/s towards an observer that has frequency. What frequency the observer can hear when i) it approaches and ii) when it passes by?
    a) approaching : 250 x $\left(\frac{v+20}{v}\right)$; leaving: 250 x $\left(\frac{v-20}{v}\right)$
    b) approaching : 250 x $\left(\frac{v}{v+20}\right)$; leaving: 250 x $\left(\frac{v}{v-20}\right)$

c) approaching : 250 x $\left(\frac{v-20}{v}\right)$; leaving: 250 x $\left(\frac{v+20}{v}\right)$

d) approaching : 250 x $\left(\frac{v}{v-20}\right)$; leaving: 250 x $\left(\frac{v}{v+20}\right)$

14. Ultrasound waves compared to audible sound waves have
    a) lower frequency and shorter wavelength.
    b) lower frequency and longer wavelength.
    c) higher frequency and longer wavelength/
    d) higher frequency and shorter wavelength.
15. The speed of sound in air is 300m/s. What is the frequency as heard by the human ear?
    a) 0.001 Hz b) 1 Hz
    c) 10,000 Hz d) 1.00,000 Hz
16. Distance between two consecutive compressions is
    a) λ b) λ/2 c) λ/4 d) 2 λ
17. Earthquake produces _____
    a) ultrasound **b) infrasound**
    c) audible sound d) none
18. Infrasound can be heard or produced by
    a) dog b) bat
    c) rhinoceros d) human beings.
19. Before playing guiter, guitarist adjust the tension and pluck the string, by doing so, he is adjusting.
    a) intensity of sound only b) amplitude
    c) frequency d) loudness of sound
20. The potch of sound depends on
    a) frequency b) amplitude
    c) both d) none
21. Sound waves in air are _____
    a) Transverse **b) longitudinal**
    c) both a&b d) none
22. Sound can travel in
    a) air **b) any material medium**
    c) vacuum d) none
23. The region of increased pressure in a wave is called
    a) crest b) through
    c) compression d) particle
24. Which voice is likely to have minute frequency?
    a) baby girl b) boy
    c) a man d) a woman
25. What is the frequency range of audible sound?
    a) 20Hz to 20 kHz b) 1.5Hz to 20kHz
    c) 10Hz to 15kHz d) 20Hz to 25kHz
26. How long sound persists in our ears?
    a) $\frac{1}{10}$ of a second b) $\frac{1}{9}$ s
    c) $\frac{1}{8}$ s d) $\frac{1}{7}$ s
27. Sound travels with a speed of 330 ms^{-1}. What is the wavelength of sound whose frequency is 550Hz?
    a) 0.6m b) 0.7m
    c) 0.4m d) 0.5m
28. Sound travels with a velocity of _____ in dry air.

a) 332ms^{-1} b) 330ms^{-1}
c) 331ms^{-1} d) 336ms^{-1}

29. Dogs can receive sound upto _____ kHz.
a) 20 **b) 25** c) 10 d) 15

30. Sound propagates maximum in
a) gas b) liquid
c) solid d) all

31. Loudness of sound varies directly with vibrating body's
a) intensity **b) amplitude**
c) pitch d) quality

32. Sound energy passing per second through a unit area held perpendicular is called.
a) intensity b) frequency
c) amplitude d) quality

33. Bats deflect from the obstacles in their path by receiving the reflected _____ waves.
a) radio **b) ultrasonic**
c) electromagnetic d) infrasonic

34. When sound travels through air, the air particles
a) do not vibrate
b) vibrate but not in any fixed direction.
c) vibrate perpendicular to the direction of wave propagation.
d) vibrate along the direction of wave propagation.

35. Sound waves do not travel through
a) vaccum b) solid
c) liquid d) gases

36. The speed of sound in a medium depends upon
a) frequency b) amplitude
c) wavelength **d) properties of the medium**

37. A source emits a frequency of 1 kHz is moving towards a rest listener with a speed of 0.9V, where V is the speed of sound wave. The frequency heard by the listener is _____
a) 10Hz b) 0.1Hz c) 100Hz **d) 10kHz**

Hint: $\left[\frac{v}{v-0.9v}\right]$ x 1 = $\left[\frac{v}{v-0.9v}\right]$ x 1 = $\frac{1}{0.1}$ x 1 = 10 kHz

38. What does it mean when a wave's amplitude increases?
a) its frequency also increases b) it is moving in denser medium
c) its wavelength gets longer **d) it carries more energy**

39. Doppler effect in sound is due to
a) motion of source b) motion of the observer
c) relative motion of source and observer d) none of these

II. FILL IN THE BLANKS:

1. Rapid back and forth motion of a particle about its mean position is called **vibration**.
2. If the energy in a longitudinal wave travels from south to north, the particles of the medium would be vibrating in **both north and south**
3. A whistle giving out a sound of frequency 450Hz, approaches a stationary observer at a speed of 33 ms^{-1}. The frequency heard by the observer is (speed of sound = 330 ms^{-1}) **500Hz**
4. A source of sound is travelling with a velocity 40 km/h towards an observer and emits a sound of frequency 2000 Hz. If the velocity of sound is 1220 km/h, then the apparent frequency heard by the observer is **2068 Hz**.
5. A wave motion is a transfer of **energy**.

6. For propagation of sound wave, the medium must posses **volume elasticity**.
7. Speed of sound in solid is **greater** than liquid.
8. In a region of compression there is **decrease** in volume.
9. Velocity of sound in air **increases** by **0.61 m/s** for every **1ºC rise in temperature**.
10. Dolphins and bats hear **ultrasound**.
11. To hear a distinct echo each time interval below the original sound and the reflected sound must be **0.1s**
12. Speed of sound depends upon **temperature** of the medium.
13. Loud sound can travel a larger distance due to **high energy**.
14. The frequency of sound wave whose time period is 0.02 second is **n = $\frac{I}{T}$ 50 Hz.**

    Hint: n = $\frac{I}{T} = \frac{I}{0.02}$ =50 Hz.
15. Sound is a form of **energy** and produced by **vibrating bodies**.
16. High and low pressure regions of longitudinal wave is called **compression and rarefaction**.
17. Energy of the sound wave is proportional to **square of the amplitude**.
18. Distance below two consecutive compressions is called **wavelength**.
19. Number of vibrations produced in one second is **frequency** of the wave
20. SI unit of frequency is **hertz**.
21. Velocity of sound is **maximum** in solids.
22. Sound waves are **longitudinal**.
23. For louder sound **intensity** will be greater.
24. To differentiate two sounds is called **quality**.
25. The speed of sound is inversely proportiaonl to **square root of density**.
26. When humidity increases, the speed of sound **increases**.
27. Reflection of sound is called **echo**.
28. Pitch depends upson **frequency** of a wave.
29. **Parabolic** surfaces are used to focus the sound at particular point.
30. Elliptical surfaces are used in designing **whispering halls.**
31. The minute distance required to hear an echo is **1/20th part** magnitude of the velocity of sound in air.
32. To determine the velocity of sound in any medium **echo** is used.
33. When source and listener move towards each other the apparent frequency is **more** than actual frequency.
34. When distance below source and listerner decreases apparent frequency become **less** than the actual frequency.
35. The average speed of sound wave in sea water is **11500 ms^{-1}**
36. The loudness of normal human voice is **60dB**
37. The minimum distance required to hear an echo is 1/20th part of the magnitude of velocity of sound in air., if the velocity of sound is **344 ms^{-1}** then the minimum distance required to hear an echo is 17.2 m.

III. True or False :- (If False give the reason)

1. Sound can travel through solids, gases, liquids and even vacuum.
   Ans: False. Sound waves **cannot travel** through vacuum
2. Waves created by Earth Quake are Infrasonic.
   Ans: True
3. The velocity of sound is independent of temperature.
   Ans: False. The velocity of sound is **dependent** of temperature.
4. The velocity of sound is high in gases than liquids.
   Ans: False. The velocity of sound is **high in liquids than gases**.
5. Sound can propagate through gaseous medium only

Ans: False. Sound can propagate through **all medium i.e. solid liquid** and gaseous medium.

6. The maximum displacement of a vibrating particle in a medium is called wavelength.
   Ans: False. The maximum displacement of a vibrating particle in a medium is called **amplitude**.
7. Time in which a wave moves a distance equal to wavelength is frequency of sound wave.
   Ans: False. Time in which a wave moves a distance equal to wavelength is **time period** of sound wave.
8. Sound travels faster in air than solid.
   Ans: False. Sound travels **slower** in air than solid.
9. Medium is not required for the propagation of sound.
   Ans: False. Medium is **required** for the propagation of sound.
10. Pitch of sound depends on the frequency of the wave.
    Ans: True.
11. Velocity of sound decreases with the increase in density of gas.
    Ans: True.
12. Velocity of sound in a gas is directly proportiaonal to square root of temperature.
    Ans: True.
13. Sound from long distance cannot be heard clearly during rainy seasons.
    Ans: False. Sound from long **distance can be** heard clearly during rainy seasons.
14. Sound is a form of energy.
    Ans: True
15. The particles of the medium move from one part to another part during propagation.
    Ans: False. The **energy** of the medium move from one part to anather part during propagation
16. Sound requires a material medium for its propagation.
    Ans: True
17. Compressions are region of lowest pressure.
    Ans: False. Compressions are region of **highest** pressure.
18. The amount of energy passing per second through uit area is called intensity of sound.
    Ans: True
19. SI unit of wavelength is cm
    Ans: False. SI unit of wavelength is **m**.
20. The sound of less than 20Hz is called ultrasound.
    Ans: False. The sound of less than 20Hz is called **infrasound**.
21. Sound waves follow the same laws of reflection as light.
    Ans: True
22. The range of hearing in humans is from 20Hz to 2000Hz.
    Ans: False. The range of hearing in humans is from **20Hz to 20,000Hz.**
23. Repetition of sound due to reflection of original sound from a surface is called echo.
    Ans: True.
24. The sensation of sound persists in all brains for about 1 second.
    Ans: False. The sensation of sound persists in all brains for about **0.1 second**.
25. Infrasonic sound is used to defect objects in ocean.
    Ans: False. **Ultrasonic** sound is used to defect objects in ocean.
26. The higher the frequency of sound, the lower is its pitch.
    Ans: False. The higher the frequency of sound, the **higher** is its pitch.
27. The number of oscillations per unit time is called frequency of the wave.
    Ans: True
28. Infra sound is produced durig earthquakes.
    Ans: Ture

29. Sound waves in air are longitudinal in nature.
    Ans: True.
30. The speed of sound in air at 22°C is 344 m/s.
    Ans: True.
31. To hear a distinct echo, the minute distance below source of rigid surface should be 27m.
    Ans: False. To hear a distinct echo, the minute distance below source of rigid surface should be **17.2m.**
32. The speed of sound in air at 0°C is 331 ms^{-1}.
    Ans: True
33. The speed of sound in air increases with decrease in temperature.
    Ans: False. The speed of sound in air increases with **increase** in temperature.
34. The pitch of the wave is directly proportional to the frequency.
    Ans: True

IV. Match the following:

1. Infrasonic	-	a) Compressions
2. Echo	-	b) 22kHz
3. Ultrasonic	-	c) 10 Hz
4. High pressure region	-	d) Ultrasonography

Ans: 1-c; 2-d; 3-b; 4-a

1. Wavelength	-	a) $\frac{1}{T}$
2. Amplitude	-	b) $v = n\lambda$
3. Frequency	-	c) Distance
4. Wave velocity	-	d) $I \alpha A^2$
5. Loudness	-	e) $E \alpha A^2$

Ans: 1-c; 2-e; 3-a; 4-b; 5-d

1. Pitch	-	a) intensity
2. Loudness	-	b) frequency
3. Quality	-	c) distance
4. Intensity	-	d) shape of wave form
5. Wavelength	-	e) dB

Ans: 1-b; 2-a; 3-d; 4-e; 5-c

1. Velocity of sound increases	-	a) i =r
2. Law of reflection	-	b) 0.1s
3. Persistence of hearing for human	-	c) $0.61 ms^{-1}$
4. Change in velocity of sound for 1°c	-	d) Classic modules
5. Acoustic impedance	-	e) density x speed

Ans: 1-d; 2-a; 3-b; 4-c; 5-e

1. Reflection of sound from concave surface	-	a) principle of echo
2. Reflection of sound from convex surface	-	b) Intensity decreases
3. Whispering gallery	-	c) 17.2m
4. Minimum, distance to hear echo	-	d) multiple reflections
5. Obstetric ultrasonography	-	e) intensity increases

Ans: 1-e; 2-b; 3-d; 4-c; 5-a

1. Sound board	-	a) detect objects in ocean
2. Mega phone	-	b) auditorium and halls
3. Ear trumpet	-	c) horn shaped device
4. Stethoscope	-	d) hearing aid

5. SONAR - e) hear sounds from internal organs

Ans: 1-b; 2-c; 3-d; 4-e; 5-a

1. Source and listerner move towards each other - a) $\left[\frac{v}{v+v_S}\right]$ n
2. Listener moves towards stationary source - b) $\left[\frac{v+v_L}{v}\right]$ n
3. Listener moves away from stationary listener - c) $\left[\frac{v+v_L}{v-v_S}\right]$ n
4. Source moves towards stationary listerner - d) $\left[\frac{v-v_L}{v}\right]$ n
5. Source moves away from listerner - e) $\left[\frac{v}{v-v_S}\right]$ n

Ans: 1-c; 2-b; 3-d; 4-e; 5-a

1. Reflection of sound - a) sound of high pitch
2. Similer sound - b) echo
3. 120 dB - c) Doppler effect
4. Apparent change in frequency - d) noise

Ans: 1-b; 2-a; 3-d; 4-c

1. Infrasonic - a) Amplitude
2. Pitch - b) 22kHz
3. Ultrasonic - c) 10Hz
4. Loudness - d) frequency

Ans: 1-c; 2-d; 3-b; 4-a

1. Acoustician - a) designs SONAR hardware
2. Bio-Acoustician - b) Diagnoses hearing impairments
3. Audiologist - c) designs concert halls.
4. Architectural acoustician - d) Analyses bird & animal populations
5. Under water acoustician - e) Designs transducers.

Ans: 1-e; 2-d; 3-b; 4-c; 5-a

V. Assertion and Reason:

Mark the correct choice as

a) both the assertion and the reason are true and the reason is the correct explanation of the assertion.
b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true, but the reason is false.
d) Assertion is false, but the reason is true.

1. Assertion: The change in air pressure affects the speed of sound.
   Reason: The speed of sound in a gas is proportional to the square of the pressure.
   Ans; c) Assertion is true, but the reason is false.
2. Assertion: Sound travels faster in solids than in gases.
   Reason: Solid posses a greater dense than that of gases.
   Ans: b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
3. Assertion: Sound wave propagates fasters in solids.
   Reason: Sound wave can propagate slightly in vacuum.
   Ans; c) Assertion is true, but the reason is false.
4. Assertion: Speed of wave = wavelength time period.
   Reason: Wavelength the distance between two nearest rarefactions.
   Ans: b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
5. Assertion: Ocean wave hitting a beach are transverse waves.

Reason: Ocean waves hitting a beach are assumed to be plane wave.
Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.

6. Assertion: Velocity of sound is maximum in soild than liquid and gases.
   Reason: Gases are least elastic in nature.
   Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
7. Assertion: Human ear can defect infrasonic waves.
   Reason: Infrasonic waves have frequency greater than 20Hz.
   Ans: d) Assertion is false, but the reason is true.
8. Assertion: Pitch distinguishes a sharp from dull sound.
   Reason: A female voice is shrill and male voice is grave.
   Ans: b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
9. Assertion: Distinguishing the loud sound from faint sound is called loudness.
   Reason: Loudness of normal human voice is 100dB.
   Ans; c) Assertion is true, but the reason is false.
10. Assertion: Sensation received by the ear called quality.
    Reason: Quality depends on the shape of wave form.
    Ans: b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
11. Assertion: During rainy season sound from long distance can be heard clearly.
    Reason: Humidity increases speed of sound increases.
    Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.
12. Assertion: Intensity of sound waves reflected from place surface is large.
    Reason: According to laws of reflection intensity varies.
    Ans: d) Assertion is false, but the reason is true.
13. Assertion: Intensity of sound wave does not change when the listener moves towards or away from the stationary source.
    Reason: The motion of listener causes the apparent change in wavelength.
    Ans: d) Assertion is false, but the reason is true.
14. Assertion: Two astronauts can talk to each other on moon through microphone.
    Reason: Microphone converts sound waves into transverse waves. It can travel even in vacuum.
    Ans: a) Both the assertion and the reason are true and the reason is the correct explanation of the assertion.

VIII. Use the analogy to fill in the blank:

1. Sound waves: longitudinal:: **Lightwaves** : transverse.
2. Speed of sound: 340 ms^{-1} :: Speed of light: **$3x10^8$ ms^{-1}**
3. Earthquake: **Infrasonic waves** :: Dolphins: Ultrasonic waves.
4. Density of gas increases: speed of sound decreases:: Humidity increases: **Speed of sound increases**.
5. **Echo**: refelction of sound:: RADAR: Doppler effect.

IX. Arrange the following in correct sequence:

1. Arrange the velocity of sound descending order.
   Velocity of sound in liquid, velocity of sound I vacuum, velocity of sound in gas, velocity of sound in solid.
   Ans: Velocity of sound in solid (v_s)
   Velocity of sound in liquid (v_L)

Velocity of sound in gas (v_G)
Velocity of sound in vacuum (v_O)
Note: $v_O = 0$

2. Arrange the mediums according to the speed of sound, in an assending order.
Aluminium, Water, Air (at 0°C), Iron
Ans: Air (at 0°C), Water, Iron, Aluminium

Air (at 0°C)	-	331 ms^{-1}
Water	-	1493 ms^{-1}
Iron	-	5950 ms^{-1}
Aluminium	-	6420 ms^{-1}

3. Arrange the categories of sound waves according to the frequency ranges
Ultrasonic waves, Ultra sound waves, infrasonic waves, Audible waves
Ans: Infrasonic waves, Audible waves, Ultrasonic waves, Ultra sound waves
Infrasonic waves < 20Hz
Audible waves – 20Hz – 20 kHz
Ultrasonic waves > 20kHz
Ultra sound waves - $>10^{13}$ Hz

6. NUCLEAR PHYSICS

I. Choose the correct answer:

1. Man made radioactivity is also known as _____
   a) Induced radioactivity — b) Spontaneous radioactivity
   c) Artificial radioactivity — **d) a & c**
2. Unit of radioactivity is _____
   a) roentgen — b) curie
   c) Becquerel — **d) all the above**
3. Artificial radioactivity was discovered by _____
   a) Becquerel — **b) Irene Curie**
   c) Roentgen — d) Neils Bohr
4. In which of the following, no change in mass number of the daughter nuclei takes place
   i) a decay ; ii) β decay ; ii) γ decay ; iv) neutron decay
   a) i is correct — **b) ii & iii are correct**
   c) I & iv are correct — d) ii & iv are correct
5. _____ isotope is used for the treatment of cancer.
   a) Radio iodine — **b) Radio Cobalt**
   c) Radio Carbon — d) Radio Nickel
6. Gamma rediations are dangerious because
   a) it affects eyes & bones — b) it affects tissues
   c) it produces genetic disorder — d) it produces enormous amount of heat
7. _____ aprons are used to protect us from gamma radiations.
   a) lead oxide — b) Iron
   c) Lead — d) Aluminium
8. Which of the following statements is are correct?
   i) α particles are photons
   ii) Penetrating power of γ radiation is very low.
   iii) Ionization power is maximum for α rays.
   iv) Penetrating power of γ radiation is very high.
   a) i & ii are correct — b) ii & iii are correct
   c) iv only correct — **d) iii & iv are correct**

9. Proton – Proton chain reaction is an example of _____
   a) Nuclear fission b) α – decay
   c) Nuclear fusion d) β – decay
10. In the nuclear reaction ${}_6X^{12} \xrightarrow{a\ decay} {}_zY^A$, the value of A &Z
   a) 8, 6 b) 8,4
   c) 4,8 d) cannot be determined with the given data
11. Kamini reactor is located at _____
   a) Kalpakkam b) Koodankulam
   c) Mumbai d) Rajasthan
12. Which of the following is/are correct?
   i) Chain reaction takes place in a nuclear reactor and an atomic bomb.
   ii) The chain reaction in a nuclear reactor is controlled.
   iii) The chain reaction in a nuclear reactor is not controlled.
   iv) No chain reaction takes place in an atom bomb.
   a) i only correct **b) i & ii are correct**
   c) iv only correct d) iii & iv are correct
13. Which of the following material is normally fissionable?
   a) U_{238} b) Th^{232} c) Pu^{240} **d) U^{235}**
14. The Control rod in a nuclear reactor is made of
   a) uranium **b) cadmium**
   c) graphite d) plutonium
14. The explosion of the atomic bomb takes place due to
   a) Nuclear fission b) Nuclear fusion
   c) Scalteling d) Heating
15. Energy generation in stars is due to
   a) chemical reaction b) fission
   c) fusion of light nuclei d) Fusion of heavy nuclei
16. Fusion reaction is initiated with the help of
   i) low temp ii) high temp iii) low press iv) high press
   a) i is correct b) ii & iv are correct
   c) i & iv are correct **d) ii & iv are correct**
17. Fusion reaction takes place at high temp.
   a) atoms are ionized b) molecules break up
   c) muclei break up **d) to overcome repulsion between nuclei.**
18. The mai source of stellar energy is
   i) fission reactors ii) fusion reaction iii) chemical reaction iv) thermonuclear reactions
   a) i is correct b) i & ii are correct
   c) i & iv are correct **d) ii & iv are correct**
19. A chain reaction is continuous due to
   a) large mass defect b) large energy
   c) production of more neutrons in fission d) none of these
20. Atomic nucleus was discovered by _____
   a) Rutherford b) Newton
   c) Einstein d) Nobel
21. Nucleons are made of _____-
   a) atoms b) electrons and protons
   c) electrons and neutrons **d) protons and neutrons**

22.henry Becquerel discovered _____ in 1890.
a) nucleus b) atom
c) isotops **d) radioactivity**

23. Elements having atomic number greater than _____are radioactive.
a) 48 b) 68 c) 88 **d) 83**

24. Positively charges radioactive rays are called _____ rays.
a) α b) β c) γ d) neutral

25. γ rays are _____ in charge.
a) positive b) negative
c) neutral d) none

26. α –rays consist of α –particles, which are _____ nuclei.
a) hydrogen **b) helium**
c) heavy water d) boron

27. Penetration power is the greatest in _____ rays.
a) alpha b) beta
c) gamma d) helium

28. _____ rays contain 1 unit of negative charge
a) Alpha **b) beta**
c) gamma d) Hydrogen

29. β –rays are nothing but _____
a) protons b) neutrons
c) electrons d) helium

30. Gamma rays are _____in nature.
a) gravitational **b) electromagnetic**
c) weak d) nuclear

31. ${}_2Be^9 + {}_2He^4 \rightarrow {}_6C^{12} + ?$
a) electron b) proton
c) neutron d) hydrogen

32. Complete the reaction ${}_{88}Ra^{226} \rightarrow {}_{86}Rn^{222} + ?$
a) ${}_{-1}e^0$ b) ${}_1e^0$ **c) ${}_2He^4$** d) ${}_0n^1$

33. Complete the reaction: ${}_{90}Th^{234} \rightarrow {}_{91}Pa^{234} + ?$.
a) ${}_2He^4$ **b) ${}_{-1}e^0$** c) ${}_1e^0$ d) ${}_1n^0$

34. Gamma rays are extensively used to destroy _____ affected cells.
a) sidde –cell aaemia **b) cancer**
c) HIV d) Polio virus

35. Irene Curie and F.Joliot discovered _____ in the year 1934.
a) Natural radioactivity b) Fluorescence
c) artificial radioactivity d) hydrogen bomb

36. Which of the following is used to detect the presence of block in blood vessels.
a) ${}_{15}P^{31}$ b) ${}_{15}P^{32}$ c) ${}_{25}Fe^{59}$ **d) ${}_{11}Na^{24}$**

37. Radio _____ is used in the treatment of cancer.
a) sodium **b) cobalt**
c) iron d) phosphorous

38. Radio _____ is used to treat problems related to the thyroid gland.
a) sodium b) cobalt
c) iron **d) iodine**

39. Radio _____ is used to locate brain tumors.
a) iron **b) iodine**

c) indium d) cobalt

40. Radio _____ is used in the treatment of skin diseases.
    a) Iron **b) phosphorous**
    c) sodium d) iodine
41. Radio –carbon dating can be done with _____
    a) only living things **b) only non-living things**
    c) both a&b d) none
42. Radio-carbon dating is used to_____
    a) treat diseases b) increase agricultural yield
    c) sterilize **d) determine the age of a specimen**
43. In molecular biology, radioisotope is used in _____ surgical instruments.
    a) engraving **b) sterilizing**
    c) sharpening d) preserving
44. Roentgen (R) is the unit to measure _____
    a) X-ray strength b) number of holes produced by X rays
    c) radiation exposure d) number of cancer cells.
45. If the exposure is about 100R, it may coause _____
    a) skin disorder b) hair loss
    c) leukemia d) death
46. If the exposure is about 600R, it causes _____
    a) skin disorder b) hair loss
    c) teeth loss **d) death**
47. _____ R is the safe limit of radiation exposure per week
    a) 25 milli b) 2.5 milli **c) 250 milli** d) 2500 milli
48. Radioactive materials are kept in thick –walled _____ containers.
    a) aluminium b) iron
    c) brick **d) lead**
49. Controlled chain reaction is seen in _____
    a) atom bombs **b) nuclear reactors**
    c) synchrotoron d) detectors.
50. In controlled chain reactions, the number of fission producing neutron is _____
    a) indefinite b) finite ad a variable
    c) a constant d) variable
51. U^{238} kept in nuclear reactors, generally decay into _____
    a) Np^{219} b) Pu^{239} **c) both a&b** d) U^{235}
52. Chain reaction is possible only when the loss of neutrons is _____ the neutrons produced.
    a) less than b) greater than
    c) equal to d) independent of
53. Minimum size of a system in which at least 1 neutron is available for further fission is called _____
    a) cut off size **b) critical size**
    c) range of reactor d) capability criteria
54. Chain reaction is possible, only if the size of system is _____ the critical size.
    a) less than **b) greater than**
    c) equal to d) independent of
55. Natural uranium consists of _____% of U^{235} and _____% of U^{238}
    a) 0.72, 99.28 b) 99.28. 0.72
    c) 77.28, 72 d) 72, 77.28
56. U^{238} os fissionable _____ neutrons.

a) only by fast b) only by slow
c) both fast and slow d) by thermal

57. _____ is fissionable by neutrons of all energies.
a) U^{235} b) U^{238} c) U^{237} d) Np^{239}

58. Atom bomb explosions produce _____ waves.
a) gravitational b) sand
c) shock d) electric

59. The first nuclear reactor was built at _____
a) Newyork b) San Fransisco
c) New jersey **d) Chicago**

60. In order to supply neutrons for research purpose, we use _____ reactors.
a) research b) power
c) production d) source

61. For production of radio – isotopes, we use _____ reactions.
a) research b) power
c) production d) absorber

62. A good _____ shows down neutrons by elastic collisions and it does not remove them by absorption.
a) fuel **b) moderator**
c) coolant d) control rod

63. Commonly used moderators are _____ and _____
a) D_2O, H_2O b) D_2, H_2 c) O_2,H_2 d) O_2, N_2

64. Graphite is used as a _____ in nuclear reactors.
a) moderator b) coolant
c) detector d) fuel

65. _____ are used to control the chain reaction.
a) control rods b) moderators
c) coolants d) neutron source

66. the moderator used in nuclear reactor is
a) cadmium b) boron oxide
c) heavy water d) uranium

67. Which of the following is not a moderator?
a) liquid sodium b) ordinary water
c) graphite d) heavy water

68. The coolant used in fast breeder reactor is
a) ordinary water b) heavy water
c) liquid sodium d) boron carbide

69. In nuclear reactors, _____ convert fast neutrons into slow neutrons.
a) source b) control rods
c) moderators d) sink

70. In a nuclear reactor, cadmium rods are used to _____
a) speed up neutrons b) slow down neutrons
c) absorb neutrons d) remove heat

71. Mass of the fissile material at the critical size is called _____
a) cut-off mass b) Einstein's mass value
c) Curie mass **d) Critical mass**

72. _____ prevents the leakage of neutrons by reflecting them back
a) mirrors b) glass

c) neutron reflectors d) coolant

73. BARC is situated at _____
a) Trombay b) Kalpakkam
c) Trivandrum d) Thumba

74. Reactor Kamini is situated at _____
a) Trombay **b) Kalpakkam**
c) Thumba d) Cochin

75. India's Nuclear power Programme has _____ reactors in operation.
a) 10 b) 12 **c) 14** d) 19

76. The explosion of hydrogen bomb is based on the principle of
a) uncontrolled fission reaction **b) nuclear fusion reaction**
c) controlled fission d) photo electric effect

77. Order of temperature of fusion reaction is _____ Kelvin.
a) 10^{17} **b) 10^{7}** c) 10^{10} d) 10^{3}

78. The mass of the product nucleus is always _____ the sum of masses of the lighter nuclei.
a) less than b) greater than
c) equal to d) the product of the product nucleus.

II. Fill in the blanks:

1. One roentgen is equal to **$3.7x10^{10}$** disintegrations per second.
2. Position is an **antiparticle of electron**.
3. Anemia can be cured by **Radio iron** isotope.
4. Abbreviation of ICRP **International Commission on Radiological Protection**.
5. **Dosi meter** is used to measure exposure rate of radiation in humans.
6. **Gamma rays** has the greatest penetration power.
7. ${}_{Z}Y^{A} \rightarrow {}_{Z+1}Y^{A} + X$; then X is **Beta particle**.
8. ${}_{Z}X^{A} \rightarrow {}_{Z}Y^{A}$ This reaction is possible in **Gamma** decay.
9. The average energy released in each fusion reaction is about **$3.84x10^{-12}$.**
10. Nucelar fusion is possible only at an extremely high temperature of the order of **10^{7} to 10^{9} K.**
11. The radio isotope of **phosphorous** helps to increase the productivity of crops.
12. If the radiation exposure is 100 R, It may cause **leukemia**.
13. Indian Atomic Energy Commission is known as **Baba Atomic Research Centre (BARC)**
14. **Dosimeter** is a device used to detect the level of exposure to ionizing radiation.
15. Nuclear power is the **fifth** largest source of power in India.
16. **Tarapur** Atomic Power Station is India's first nuclear power station.
17. Total number of power station in India is **seven**.
18. Number of **nuclear** reacotrs operating in India are **22**.
19. Name the nuclear power stations established in India. **Maharashtra, Rajasthan, Gujrat, Uttar Pradesh and two in Tamilnadu.**
20. The pehenomenon of radioactivity was discovered by **Henri Becquerel**.
21. Radioactive elements radium and polonium were discovered by **Marie Curie and Pierre Curie.**
22. The phenomenon of radioactivity is exhibited by elements having atomic number **greater than 82.**
23. The phenomenon or radioactivity is **spontaneous emission**.
24. In the phenomenon of radioactivity, which of the following rays are emitted **α –rays**.
25. The radioactivity phenomenon is not affected by **temperature**.
26. α –particles is a **helium** nucleus.
27. **2** units of positive charge does α –rays.
28. β –rays are nothing but **electron** .
29. **1** units of negative chage does β – rays.

30. **γ rays** have the highest penetrating power.
31. **γ rays** have the least ionizing power.
32. **Soddy and Fajan** framed the displacement laws governing radioactivity.
33. When an α – particles is emitted, a new atomic nuclei is formed whose **atomic number decreases by two and mass number decreases by four.**
34. When a γ – particle is emitted from a radioactivity atom **mass number and atomic number remains unchanged, only energy level changes.**
35. When a radioactivity nucleus disintegrates by emitting a β – particle **atomic number increases by one and mass number remains the same.**
36. Unit of Activity is **Becquerel**.
37. 1 Becquerel= **one** disintegrations per second.
38. Curie is defined as the quantity of radioactive substance which gives **$3.7x10^{10}$** disintegrations per second.
39. The activity of one gram of radium is equal to **$3.7x10^{10}$**
40. Artificial radioactivity was discovered by **Irene Curie and F. Joliot**
41. The particle that is emitted only in artificial radioactivity is **Positron**.
42. The radioactive isotope used in the treatment of cancer is **Co^{60}**
43. The radioactive isotope used to check the effective functioning of heart is **Na^{24}.**
44. The radioactive isotope used in the treatment of thyroid gland and to locate brain tumours is **I^{137}.**
45. The radioactive isotope used to diagnose anaemia is **Fe^{59}**.
46. The radioactive isotope usd in the treatment of skin disease **is P^{32}**
47. The radioactive isotope used to incease the crop yield is **Fe^{59}.**
48. The radioactive isotope used in estimating the age of specimens is **C^{14}**
49. When γ –rays or any high energy nuclear particle passes through human beings, the effect may be **hazardous**.
50. Smaller dose of radiation exposure causes **skin disorder**.
51. Radiation exposure of **100 R** causes leukemia or cancer.
52. Radiation exposure fo **600R** causes death.
53. Safe limit of radiation exposure is **250 mR** per week.
54. The process in which nucleus of one element is converted into nucleus of another element is **nuclear reaction**.
55. Neil Bhr and John A. Wheelar explained the nuclear fission process with the help of **liquid drop model**.
56. The minimum size in which atleast one neutron is available for further fission reaction is called **critical size**.
57. The mass of the fissile material at the critical size is called **critical mass**.
58. Percentage of U^{238} in natural uranium is **99.28%**
59. Percentage of U^{235} in natural uranium is **0.72%**
60. Nuclear fission reaction takes place in a controlled manner is **atom bomb**.
61. The first nuclear reactor was built in **USA**.
62. Reactors that convert fertile material into fissile material is called **breedor reactor**.
63. **U^{235}** is used as fuel in nuclear reactor.
64. The only reactor which uses ${}_{92}U^{233}$ as fuel in the world is **kamini**.
65. The fast neutrons can be turned to slow neutrons using **moderators**.
66. The control rods are **Cadmium rods**.
67. Control rods are used to **control chain reaction**.
68. Commonly used coolants in nuclear reactor are **heavy water.**
69. Who was the first chairman of the atomic energy commission? **Dr. Homi J.Bhabha**.

70. One of the research reactors at BARC is **Apsara (or) Dhruva**
71. The research reactor at Kalpakkam is **Kamini**.
72. Fusion process can be carried out only at extremely high temperature of the order **of 10^7 K**
73. The nuclear fusion reactions are known as **thermonuclear reactions**.
74. The principle used in hydrogen bomb is **nuclear fusion**.
75. the principle used in Atom bomb is **Nuclear fission**.
76. The temperature required for the purpose of fusion is produced by **fission reactions**.
77. One twelth of the mass of carbon atom $_6C^{12}$ is equal to **one atomic mass unit**.
78. 1eV is equal to **$1.6x10^{-19}$J**

III. State whether the following statements are True or False: If False, correct the statement.

1. Plutonium -239 is a fissionable material.
   Ans. True
2. Elements having atomic number greater than 83 can undergo nuclear fusion.
   Ans: False. Elements having atomic number greater than 83 can undergo nuclear fusion not fusion.
3. Nucelar fission is more dangerous than nuclear fission.
   Ans: True.
4. Natural uranium U-238 is the core fuel used in a nuclear reactor.
   Ans: False. Natural uranium **U-235** is the core fuel used in a nuclear reactor.
5. If a moderator is not present, then a nuclear reactor will behave as an atom bomb.
   Ans: False. If a moderator is not present, then a nuclear reactor will not behave as an atom bomb.
6. During one nuclear fission on an average, 2 to 3 neutrons are produced.
   Ans: True.
7. Einstein's theory of mass energy equaivalence is used in nuclear fission and fusion.
   Ans: True
8. J.J Thomson discovered nucleus.
   Ans: False. J.JThomson discovered **electrons**.
9. Rutherford explained mass of an atom is concentrates in its central part.
   Ans: True
10. Goldstein discovered cathode rays.
    Ans: False. Goldstein discovered **positive** rays.
11. Henri Becquerel discovered uranium.
    Ans: False. Henri Becquerel discovered **radioactivity**.
12. Natural radioactivity is known as spontaneous radio activity.
    Ans: True
13. Marie Curie and pierre Curie discovered radium & polarization.
    Ans: True
14. Elements whose atomic number is less than 83 undergo spontaneous radioactivity.
    Ans: False. Elements whose atomic number is **more than** 83 undergo spontaneous radioactivity.
15. Irene Curie & Joliot discovered, natural radioactivity.
    Ans: False. Irene Curie & Joliot discovered, **artificial** radioactivity.
16. Artificial radioactivity is called natural radioactivity.
    Ans: False. Artificial radioactivity is called **man made** radioactivity.
17. The other name of artificial radioactivity is called induced radioactivity.
    Ans: True
18. The SI unit of radioactivity is Curie.
    Ans: False. The SI unit of radioactivity is **Becquerel**.
19. The radiation exposure of γ –ray is measure by Rutherford.
    Ans: False. The radiation exposure of γ –ray is measure by **Roentgen**.

20. Ionising power of α –rays is 10,000 times greater than β –rays.
    Ans: False. Ionising power of α –rays is 10,000 times greater than **gamma** rays.
21. Gamma rays are deflected by both electron and magenetic fields.
    Ans: False. Gamma rays are **not deflected** by both electron and magenetic fields.
22. Beta rays travels with the speed of light.
    Ans: False. **Gamma** rays travels with the speed of light.
23. In α-decay atomic number of daughter nucleus is increased by one.
    Ans: False. In **β–decay** atomic number of daughter nucleus is increased by one.
24. In α –decay, the mass number decreases by four.
    Ans: True.
25. Splitting up of a heavier nucleus into two smaller nuclei is called nuclear fusion.
    Ans: False. Splitting up of a heavier nucleus into two smaller nuclei is called nuclear **fission**.
26. A radioactive elements is converted into fissionable material are called fissile material.
    Ans: False. A radioactive elements is converted into fissionable material are called **fertile** material.
27. Controlled chain reaction is used in atom bomb.
    Ans: False. Controlled chain reaction is used in **nuclear** bomb.
28. The minimum mass of fissile material required to sustain chain reaction is called critical mass.
    Ans: True.
29. Two lighter nuclei combined to form heavier nuclei is nuclear fission.
    Ans: False. Two lighter nuclei combined to form heavier nuclei is nuclear **fusion**.
30. Nuclear fission is a thermonuclear reaction.
    Ans: False. Nuclear **fusion** is a thermonuclear reaction.
31. Nuclear reactor is used to produce electricity.
    Ans: True
32. P-32 helps to increase productivity of crops.
    Ans: True
33. To detect the explosives in the luggage Am^{241} is used.
    Ans: False. To detect the explosives in the luggage **Cf^{252}** is used.
34. To find the age of the rock and earth radio carbon is used.
    Ans: True
35. Safe limit of exposure to radiation is 20 milli sievert per month.
    Ans: False. Safe limit of exposure to radiation is 20 milli sievert per **year**.
36. When body is exposed to 600R, it causes total disease.
    Ans: False. When body is exposed to 600R, it causes total **death**.
37. To check the level of radiation dosimeters should be worn.
    Ans: True.
38. The function of control rods is to obsorb the part of the K.E of the neutrons.
    Ans: False. The function of **moderator** is to obsorb the part of the K.E of the neutrons.
39. The function of coolant is to extract heat from reactor.
    Ans: True
40. The nuclear energy is measured in Curie.
    Ans: False. The nuclear energy is measured in **Mev**.
41. Tarapur power staion is the India's first nuclear station.
    Ans: True
42. Apsara is the first nuclear reactor built in Asia.
    Ans: True

IV. Match the following:

A. Match the following

1. BARC - a) Kalpakkam
2. India's first atomic power station - b) Apsara
3. IGCAR - c) Mumbai
4. First nuclear reactor in India - d) Tarapur

Ans: 1-c; 2-d; 3-a; 4-b

B. Match the following

1. Fuel - a) Lead
2. Moderator - b) Heavy water
3. Coolant - c) Cadmium rods
4. Shield - d) Uranium

Ans: 1-d; 2-c; 3-b; 4-a

C. Match the following

1. Soddy Fajan - a) Natural radio activity
2. Irene Curie - b) Displacement law
3. Henry Becquerel - c) Mass energy equivalence
4. Albert Einsein - d) Artificial Radio activity

Ans: 1-b; 2-d; 3-a; 4-c

D. Match the following

1. Uncontrolled fission reaction - a) Hydrogen Bomb
2. Fertile material - b) Nucealr reactor
3. Controlled fission reaction - c) Breeder reactor
4. Fusion reaction - d) Atom bomb

Ans: 1-d; 2-c; 3-b; 4-a

E. Match the following

1. Co -60 - a) Age of fossil
2. 1.1- 131 - b) Function of Heart
3. Na -24 - c) Leukemia
4. C- 14 - d) Thyroid disease

Ans: 1-c; 2-d; 3-b; 4-a

F. Match the following

1. Beta decay - a) Becquerel
2. Gamma decay - b) no change in mass number
3. Alpha decay - c) no change in mass number & atomic number
4. Activity of sample - d) change in mass number & atomic number.

Ans: 1-b; 2-c; 3-d; 4-a

G. Match the following

1. Moderator - a) uranium
2. Goolant - b) heavy water
3. Fuel - c) liquid sodium
4. Control rod - d) boron

Ans: 1-b; 2-c; 3-a; 4-d

H. Match the following

1. Safe limit - a) 600R
2. Dosimeter - b) 100R
3. Leukemia - c) Exposure of X ray & Y ray
4. De - d) Nuclear fusion.

Ans: 1-b; 2-d; 3-a; 4-c

V. Arrange the following in the correct sequence:

1. **Arrange in desending order, on the basis of their penetration power.**
   Alpha rays, beta rays, gamma rays, cosmic rays
   Ans: Gamma rays, Beta rays, Alpha rays, Cosmic rays.
2. **Arrange the following in the chronological order of discovery.**
   Nucelar reactor, radioactivity, artificial radioactivity, discovery of radium
   Ans: Radioactivity, Discovery of radium, artificial raido activity, Nucealr reactor.
3. **Write in decending order, the ionizing property of the given rays.**
   B-rays, γ-rays, α-rays, I-R rays
   Ans: α-rays, B-rays, γ-rays, I-R rays
   Note: I-R rays are non-ionising rays.
4. **Write in ascending order, the radioactive elements according to the atomic number.**
   N_P, Pu, U, Pa
   Ans: Pa, U, N_P, Pa
   Pa→Protactinium (91) U → Uranium (92)
   N_P → Neptunium Pu→ Plutonium

VI. Use the Analogy to fill in the blank.

1. Spontaneous process: Natural Radioactivity :: Induced process: **Artificial radioactivity**
2. Nuclear Fusion: Extreme temperature ::Nuclear Fission : **Room temperature**.
3. Increasing crops: Radio phosphorous :: Effective functioning of heart : **Radio sodium**.
4. Deffected by electric field : α ray :: Null Deflection: **γ – ray**
5. Heavier elements into higher elements: **Nuclear fission** ::Lighter elements into heavier elements : Nuclear fusion.
6. α –rays: helium particles :: β – rays : **electrons**.
7. **β – rays** : negative charged particles :: γ – rays : neutral
8. P^{32} : cure skin diseases :: Fe^{59} : **diagnose anaemia**.

VIII. Assertion and Reason:

Mart the correct choice as

a) If both the assertion and the reason are true and the reason is the correct explanation of the assertion.
b) If both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
c) Assertion is true, but the reason is false.
d) Assertion is false, but the reason is true.

1. Assertion: A neutron impinging on U-235. Splits into produce Barium and Krypton.
   Reason: U-235 is a fissile material.
   Ans: b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
2. Assertion: In a β – decay, the neutron number deceerases by one.
   Reason: In β – decay atomic number inceases by one.
   Ans: d) Assertion is false, but the reason is true.
3. Assertion: Extreme temperature is necessary to execute nuclear fusion.
   Reason: In a nuclear fusion, the nuclei of the reactants combine releasing high energy.
   Ans: c) Assertion is true, but the reason is false.
4. Assertion: Control rods are known as 'neutron seeking rods'.
   Reason: Control rods are used to perform sustained nuclear fission reaction.
   Ans: d) Assertion is false, but the reason is true.
5. Assertion: Radioactive nuclei emit beta particles.
   Reason: Electron exist inside the nucleus.
   Ans: c) Assertion is true, but the reason is false. – β ray is emitted from the nucleus.

6. Assertion: ${}_{Z}X^{A}$ undergoes 2 α – decays and the daughter product is ${}_{Z-4}Y^{A-8}$.
   Reason: In α – decays the mass number deceases by 4 and atomic number decreases by 2.
   Ans: a) both the assertion and the reason are true and the reason is the correct explanation of the assertion.
7. Assertion: Among alpha beta and gamma rays, α – particle has maximum penetrating power.
   Reason: The α – particle is heavier than β & γ rays.
   Ans: d) Assertion is false, but the reason is true. – The penetrating power is heavier for γ – rays.
8. Assertion: The ionizing power of β – particle is less compared to α particles but their penetrating power is more.
   Reason: The mass of β – particle is less than the mass of α – particle.
   Ans; b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
9. Assertion: Radioactivity is a spontaneous process.
   Reason: Nuclear radiation emission depends on the nature of substance.
   Ans: c) Assertion is true, but the reason is false.
10. Assertion: A cadmium is used for making control rods in nuclear reactors.
    Reason: Cadmium is very effective in slowing down the speed of neutrons.
    Ans: c) Assertion is true, but the reason is false.
11. Assertion: Neutrons are the best bombarding particles.
    Reason: Neutrons are neutral particles.
    Ans: a) both the assertion and the reason are true and the reason is the correct explanation of the assertion
12. Assertion: The basic principle involved in H_2 bomb is nuclear fission.
    Reason: Controlling the nuclear fusion is not successful.
    Ans: d) Assertion is false, but the reason is true.
13. Assertion: C-14 isotope of carbon is used in carbon dating of rocks, fossils etc.
    Reason: Radioactive carbon decays through emission of β-rays.
    Ans; b) both the assertion and the reason are true but the reason is not the correct explanation of the assertion.
14. Assertion: A heavy water acts as a moderator in nuclear reactors.
    Reason: Heavy water absorbs fast moving electrons.
    Ans: c) Assertion is true, but the reason is false.
15. Assertion: γ – rays have very high penetrating power.
    Reason: γ – rays are high energy radiator.
    Ans: a) both the assertion and the reason are true and the reason is the correct explanation of the assertion

Chemistry

7. ATOMS AND MOLECULES

I. Choose the correct answer:

1. Which of the following has the smallest mass?
   a) 6.023×10^{23} atoms of He **b) 1 atom of He**
   c) 2 g of He d)1 mole atoms of He
2. Which of the following is a triatomic molecule?
   a) Glucose b) Helium
   c) Carbon dioxide d) Hydrogen
3. Th e volume occupied by 4.4 g of CO2 at S.T.P
   a) 22.4 litre **b) 2.24 litre**
   c) 0.24 litre d) 0.1 litre

4. Mass of 1 mole of Nitrogen atom is
   a) 28 amu b) 14 amu
   c) 28g d) 14 g
5. Which of the following represents 1 amu?
   a) Mass of a C – 12 atom b) Mass of a hydrogen atom
   c) 1/12th of the mass of a C – 12 atom d) Mass of O – 16 atom
6. Which of the following statement is incorrect?
   a) One gram of C – 12 contains Avogadro's number of atoms.
   b) One mole of oxygen gas contains Avogadro's number of molecules.
   c) One mole of hydrogen gas contains Avogadro's number of atoms.
   d) One mole of electrons stands for 6.023 × 1023 electrons.
7. The volume occupied by 1 mole of a diatomic gas at S.T.P is
   a) 11.2 litre b) 5.6 litre
   c) 22.4 litre d) 44.8 litre
8. In the nucleus of $_{20}Ca^{40}$, there are
   a. 20 protons and 40 neutrons **b. 20 protons and 20 neutrons**
   c. 20 protons and 40 electrons d. 40 protons and 20 electrons
9. The gram molecular mass of oxygen molecule is
   a) 16 g b) 18 g
   c) 32 g d) 17 g
10. 1 mole of any substance contains ____ molecules.
   a) 6.023×10^{23} b) 6.023×10^{-23}
   c) 3.0115×10^{23} d) 12.046×10^{23}
11. The mass of an atom is measured in _____
   a) kg **b) amu**
   c) g d) Pm
12. Atoms of different elements with different atomic numbers, but same mass number are known as
   a) isobars b) isotopes
   c) isotones d) isomers
13. Pick out the isotopes among the following pairs
   a) $_{6}C^{13}$, $_{7}N^{14}$ b) $_{18}Ar^{40}$, $_{20}Ca^{40}$
   c) $_{6}C^{12}$, C^{14}_{6} d) $_{5}B^{12}$, $_{6}C^{13}$
14. Which among the following is a homo atomic molecule?
   a) N_2 b) NH
   c)HCI d) N_2O
15. Identify the 'hetero nuclear tn atomic molecule' among the following.
   a) P_4 b) H_2SO_4
   c) CO_2 d) O_3
16. Mass number is the
   a) Number of protons b) Sum of protons and electrons
   c) Number of neutrons **d) Sum of protons and neutrons**
17. Which of the following statement regarding an atom is always correct?
   a) An atom has equal number of electrons and protons
   b) An atom has equal number of electrons and neutrons
   c) An atom has equal number of electrons, protons and neutrons
   d) An atom has equal number of protons and neutrons
18. Atomicity of Chlorine and neon is
   a) Mono atomic and mono atomic b) Mono atomic and diatomic

c) Diatomic and diatomic **d) Diatomic and mono atomic**

19. Mass of an electron is _____
a) 9.1083×10^{-31}kg b) 9.1083×10^{-24}kg
c) 1.67262×10^{-27} kg d) 1.67×10^{-24} gm

20. Which of the following pairs are isotopes?
a) oxygen and ozone b) ice and water
c) NO and NO **d) Hydrogen and deuterium**

21. Atomic number of an element is 12 and its mass number is 24. The number of electrons, protons and neutrons respectively will be
a) 12,12,24 b) 24,12,12
c) 12,12,12 d) 12,24,12

22. An atom which has a mass number of 14 and 8 neutrons is an
a) isotope of nitrogen b) isotope of oxygen
c) isotope of carbon **d) isobar of carbon**

23. Which of the following has an equal number of neutrons and protons?
a) protium b) deuterium
c) tritium **d) magnesium**

24. An atom of an element has 13 electrons and mass number 27 The nucleus of this atom contains _____ neutrons.
a) 26 b) 13
c) 14 d) 27

25. The relative atomic masses of many elements are not whole number because
a) they are not determined accurately **b) they exist as isotopes**
c) due to impurities d) atoms ionize

26. The smallest particle of an element which involve in a chemical reaction is
a) atom b) molecule
c) mole d) avogadro's molecule

27. $_{17}Cl^{35}$, $_{17}Cl^{37}$ from the pair of
a) Isotope b) isonar
c) isotone d) isomer

28. Isotones have equal number of
a) proton b) electron
c) neutron d) atom

29. The atomicity of chlorine is
a) 1 b) 4 c) 8 **d) 2**

30. Total number of atoms in 4g of oxygen molecule is
a) 6.023×10^{23} **b) 7.52×10^{22}**
c) 1.5055×10^{23} d) 0.0752×10^{23}

31. Which of the following contains maximum number of molecules?
a) 1g of N_2 b) 1g of CO_2
c) 1g of H_2 d) 1g of O_2

32. What is the mass of 12.044×10^{23} number of O_2 molecules?
a) 8g b) 16g
c) 32g **d) 64g**

33. The total number of electrons present in 16g of methane gas is
a) 96.252×10^{23} b) 48.176×10^{23}
c) 6.023×10^{23} d) 30.11×10^{23}

34. The number of atoms in 0.1 mole of a traitomic gas is

a) $6.023x10^{22}$ b) $1.806x10^{23}$
c) $3.6x10^{23}$ d) $1.8x10^{22}$

35. The number of particles present in one mole of any substance is equal to
a) $6.023x10^{23}$ b) $60.25x10^{23}$
c) $6.023\ x10^{27}$ d) $60.23\ x10^{27}$
36. Total number of molecules in 44g of CO_2 is
a) $6.023\ x\ 10^{23}$ b) $6.023x10^{24}$
c) $1.806\ x10^{24}$ d) $18.06x10^{22}$
37. What mass of hydrogen and oxygen will be produced on complete electrolysis of 18g of water.
a) 2g hydrogen and 32g oxygen **b) 2g hydrogen and 16g oxygen**
c) 4g hydrogen and 32g oxygen d) 4g hydrogen and 14g oxygen
38. Which of the following contains maximum number of molecules?
a) 1g of CO_2 b) 1g of N_2
c) 1g of H_2 d) 1g of CH_4
39. Which of the following correctly represent 360g of water?
i) 2 moles of H_2O ii) 20 moles of water
iii) $6.023x10^{23}$ molecules of water iv) $1.2046x10^{24}$ molecules of water.
a) i b) i and iv
c) ii and iii **d) ii and iv**
40. Which of the following has largest number of particles?
a) 8g of CH_4 b) 4.4g of CO_2
c) 34.2g of $C_{12}H_{22}O_{11}$ **d) 2g of H_2**
41. The number of molecules in 16.0g of oxygen is
a) $6.023\ x\ 10^{23}$ b) $6.023\ x\ 10^{-23}$
c) $3.01\ x\ 10^{-23}$ **d) $3.0115\ x\ 10^{23}$**
42. The mass of Sodium in 11.7 g of sodium chloride is
a) 2.3g **b) 4.6g**
c) 6.9g d) 7.58g

Hint: NaCl 23 +35.5 = 58.5

Mass of Na in 58.5gm NaCl = 23.

:. Mass of Na in 11.7gm of NaCl = $\frac{2.3\ x\ 11.7}{58.5}$ = 4.6gms

43. The formula of a chloride of a metal M is MCl3, the formula of the phosphate of metal M will be:
a) MPO_4 b) M_2PO_4
c) M_3PO_4 d) $2(PO_4)_3$
44. Which of the following contains the largest number of molecules?
a) 0.2 mol H_2 **b) 8.0gH_2**
c) 17g of H_2O d) 6.0g of CO_2

Hint: 8.0g of H_2

2gm of H_2 = $6.023\ x\ 10^{23}$

8gm of H_2 = $6.023\ x\ 10^{23}\ x\ 4$

= $24.092x10^{23}$ molecules.

45. One gram of which of the following contains largest number of oxygen atoms?
a) O b) O_2
c) O_3 d) all contains same
46. One mole of a gas occupies a volume of 22.4 I. this is derived from
a) Berzelius's hypothesis b) Gay-Lussac's law
c) Avogadro's law d) Dalton's law

47. The mass of one Catom is:
    a) 6.023×10^{23}g **b) 1.99×10^{-23}g**
    c) 2.00g d) 12g
    Hint: 6.023×10^{23} atoms of C = 12gm
    $$1 \text{ atom of } C = \frac{6.023 x 10^{23 x 6}}{44} = 1.99 x 10^{-23}$$
48. A group of atoms chemically bonded together is a (an):
    a) molecule b) atom
    c) salt d) element
49. Adding electrons to an atom will result in a (an):
    a) molecule **b) anion**
    c) cation d) salt
50. The molecule formula P_2O_5 means that:
    a) a molecule contains 2 atoms of P and 5 atoms of O
    b) The ratio of the amss of P to the mass of O in the molecule is 2:5
    c) There are twice as many P atoms in the molecule as there are O atoms.
    d) The ratio of the mass of P to the ass of O in the molecule is 5.2.
51. The weight of a molecule of the compound $C_{60}H_{122}$ is:
    a) 1.4×10^{-21}g b) 1.09×10^{-21}g
    c) 5.025×10^{23}g d) 16.023×10^{23}g
    *Hint: Masss of **1 molecule $C_{60}H_{122}$***
    $$= \frac{Molecules\ mass\ x\ no.of\ particles}{Avagadro's\ No.}$$
    $$= 842 \times 6.023 \times 10^{23}$$
    $$= 139.797 \times 10^{-23} = 1.39797 \times 10^{-21} g$$
    $C_{60}H_{122} = 12 \times 60 + 1 \times 122$
    $= 720 + 122 = 842$
52. The total number of atoms represented by the compound $CuSO_4$, SH_2O is
    a) 27 **b) 21** c) 5 d) 8
53. Volume of a gas at STP is 1.12×10^{-7} cc. Calculate the number of molecules in it.
    a) 3.01×10^{20} **b) 3.01×10^{15}**
    c) 3.01×10^{23} d) 3.01×10^{24}
    Hint: 22.4 lts = 6.23×10^{23} molecules
    $$1.12 \times 10^{-7} cc = \frac{6.023 x 1023 \times \frac{0.05}{\cancel{1.12}} \times 10-7}{\cancel{22.4}} = 6.023 \times 0.05 \times 10^{(23-7)}$$
    $$= 0.30115 \times 10^{16} = 3.0115 \times 10^{15}$$
54. The number of molecules of CO_2 present in 44g of CO_2 is
    a) 6.023×10^{23} b) 3×10^{23}
    c) 12×10^{23} d) 3×10^{10}
55. The volume occupied by 4.4 g of CO_2 at STP is
    a) 22.4L **b) 2.24L**
    c) 0.224L d) 0.1L
56. How many molecules are present in one gram of hydrogen?
    a) 6.023×10^{23} **b) 3.0115×10^{23}**
    c) 2.5×10^{23} d) $1.5c10^{23}$
57. Which of the following is a diatomic molecule?
    a) CO b) CO_2
    c) SO_3 d) PO_4
58. Atomicity of Sulphur is

a) 1 b) 2 c) 4 **d) 8**

59. Which of the following has the highest number of molecule?
    a) 2g of H_2 b) 34.2g of $C_{12}H_{22}O_{11}$
    c) 4.4g of CO_2 d) 8g of SO_2
60. Isotopes have
    a) same physical properties and different chemical properties.
    b) same chemical properties and different physical properties.
    c) same physical and chemical properties
    d) different physical and chemical properties.
61. The vapour density of the helium gas is
    a) equal to 1 b) less than 1
    c) greater than 1 d) 0
62. The gram molecular mass of CO_2 is
    a) 16g b) 18g **c) 44g** d) 17g
63. 2 x vapour density is equal to
    a) Gram molecular weight **b) relative molecular weight**
    c) atomic weight d) gram atomic weight

II. Fill in the blanks:

1. Atoms of different elements having **same** mass number, but **different** atomic numbers are called isobars.
2. Atoms of different elements having same number of **neutrons** are called isotones.
3. Atoms of one element can be transmuted into atoms of other element by **artificial transmutation**.
4. The sum of the numbers of protons and neutrons of an atom is called its **mass number**.
5. Relative atomic mass is otherwise known as **standard atomic weight**.
6. The average atomic mass of hydrogen is **1.0079** amu. .
7. If a molecule is made of similar kind of atoms, then it is called **Homo** atomic molecule.
8. The number of atoms present in a molecule is called its **atomicity**.
9. One mole of any gas occupies **22400** ml at S.T.P
10 Atomicity of phosphorous is **4** .
11. The mass of the molecule of an element or compound is measured in **C^{-12}** scale.
12. The value of Avogadro's number is **6.023×10^{23}**.
13. **Atom** is the smallest indivisible entity of matter.
14. $_{17}CI^{35}$ and $_{17}CI^{37}$ are **Isotopes**.
15. Isotopes have same **atomic number** but different **mass number**.
16. The mass of an atom is concentrated in a small region of space called the **nucleus**.
17. The subatomic particle which is not present in hydrogen atom is **neutrons**.
18. Anything that has mass and occupies space is called **matter**.
19. The number of electrons present in hydrogen atom **is 1.**
20. Atomicity of oxygen is **2**.
21. H1 is an example of **hetero diatomic** molecule.
22. An example of homotriatomic molecule is **O_3 Ozone**
23. Gram molar mass of H_2O is **18g**
24. The allotrope of oxygen is **ozone**.
25. Relative molecular mass of sulphuric acid is **98.**
26. One mole of any gas at STP occupies **22.4 litres.**
27. Atoms of the same element may have different **mass number.**
28. The mas of macroscopic materials are measured in **grams or kilogram**.
29. The atomic mass of an element is expressed in grams is known as **Gram Atomic Mass**.

30. Smallest particles of an element which can take part in any chemical change is known as an **atom**.
31. Number of protons and number of electrons are always equal in **an atom**.
32. Atoms of same elements have same number of **protons**.
33. Hydrogen has **three** isotopes.
34. The molecule is made of similar kind of atoms is called **homoatomic molecule**.
35. The molecule that consist of atoms of different elements are called **heteroatomic** molecule.
36. The molecules contains more than two atoms are called **polyatomic** molecule.
37. Atom was proposed by **John Dolton**.
38. The symbol 'amu' 'u' denotes unified **atomic mass.**
39. The gram atomic mass of an element is expressed in **grams**.
40. A compound is a **heteroatomic** molecule.
41. STP means **Standard Temperature and Pressure**.
42. One mole of oxygen contains **6.023×10^{23}** atoms of oxygen.

III. Match the following:

A. Match the following

1. 8 g of O_2 - a) 4 moles
2. 4 g of H_2 - b) 0.25 moles
3. 52 g of He - c) 2 moles
4. 112 g of N_2 - d) 0.5 moles
5. 35.5 g of Cl_2 - e) 13 moles

Ans: 1-b; 2-c; 3-e; 4-a; 5-d

B. Match the following

1. Monoatomic - a) S_8
2. Diatomic - b) CO_2
3. Triatomic - c) P_4
4. Tetratomic - d) N_2
5. Octatomic - e) He

Ans: 1-e; 2-d; 3-b; 4-c; 5-a

C. Match the following

Element	Atomic Mass	Molecular Mass	Atomicity
1) Nitrogen	14	28	**2**
2) Ozine	**16**	48	3
3) Helium	4	**4**	1

D. Match the following

1. Isotones - a) Avogadro's number of particles.
2. Isotopes - b) 22.4 litre
3. Avogadro - c) same number of neutrons
4. Gram molar volume - d) 6.023×10^{23}
5. One mole - e) same number of electrons.

Ans; 1-c; 2-e; 3-d; 4-b; 5-a

E. Match the following

1. 0.5 moles of SO_2 - a) $5 \times 6.023 \times 10^{23}$ atoms
2. 5 moles of O_2 atoms - b) Molecular mass
3. 2 x vapour density - c) 3.0115×10^{23} molecules.
4. Avogadro's law - d) 28g
5. Mass of 0.5 moles of iron - e) Number of moles

Ans: 1-c; 2-a; 3-b; 4-e; 5-d

IV. State whethere the following statements are True or False. If False, correct the statement.

1. Two elements sometimes can form more than one compound.
   Ans: True
2. Noble gases are Diatomic.
   Ans: False. Noble gases are **monoatomic**.
3. The gram atomic mass of an element has no unit.
   Ans: False. The gram atomic mass of an element is **exposed in grams**
4. 1 mole of Gold and Silver contain same number of atoms.
   Ans: True
5. Molar mass of CO_2 is 42g.
   Ans: False. Molar mass of CO_2 is **44g**.
6. An electron has a mass that is very much less than a proton.
   Ans: True
7. The nucleus of an atom consists of protons and electrons.
   Ans: False. The nucleus of an atom consists of protons & neutrons.
8. An example of hetero diatomic molecule is CO_2.
   Ans: False. An example of hetero diatomic molecule is **CO.**
9. The mass of the molecule of an element or compound is measured in hydrogen scale.
   Ans: True
10. Avogadro's number is 6.023×10^{-23}
    Ans: False. Avogadro's number is 6.023×10^{23}
11. Atoms of the same element may have different atomic mass.
    Ans: True
12. Atms can be created and destroyed.
    Ans: False. Atoms can **netiher** be created nor destroyed.
13. Relative atomic mass is expressed in grams.
    Ans: False. Relative atomic mas has **no unit.**
14. Atom does not have chemical bond.
    Ans: True
15. An atom is no longer indivisible.
    Ans: True.
16. Anything that has mass and occupies space is called matter.
    Ans: True
17. The mass of macroscopic materials is litre.
    Ans: False. The mass of macroscopic matierals is **Kilogram (or) gram**.
18. Chemist measure atoms and molecules in kilogram.
    Ans: False. Chemist measure atoms and molecules in **moles**.
19. Atomicity of a monoatomic element = molecular mass / atomic mass.
    Ans: True

V. A. Assertion and Reason:

Answer the following questions using the data given below:

i) A and R are correct, R explains the A.
ii) A is correct, R is wrong.
iii) A is wrong, R is correct.
iv) A and R are correct, R doesn't explains A

1. Assertion: Atomic mass of aluminium is 27
   Reason: An atom of aluminium is 27 times heavier than 1/12th of the mass of the C – 12 atom.
   Ans: i) A and R are correct, R explains the A.
2. Assertion: The Relative Molecular Mass of Chlorine is 35.5 a.m.u.

Reason: The natural abundance of Chlorine isotopes are not equal.

Ans: i) A and R are correct, R explains the A.

V. B. Assertion and Reason:

Answer the following questions using the data given below:

a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion

b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion

c) Assertion is false but reason is true

d) Assertion is true but reason is false

3. Assertion (A): An atom is electrically neutral.
   Reason (R): No of protons = No. of electrons.

Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion

4. Assertion (A): Atomicity of nitrogen is 2.
   Reason (R): Atomicity = $\frac{\text{Molecular mass}}{\text{Atomic mass}}$

Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion

5. Assertion (A): Atomic masses of elements are whole numbers.
   Reason (R): Atoms of the same element exist as isotopes.

Ans: c) Assertion is false but reason is true

6. Assertion (A): Molecular weight of $SO_2$is double to that of O_2
   Reason (R): One mole of SO_2 contains double the number of molecules present in one mole of O_2

Ans: d) Assertion is true but reason is false

7. Assertion(A): 1 Mole of O_2 and N_2 occupu 22.4L at STP.
   Reason (R): Molar volume of all gases at STP has the same value

Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion

8. Assertion (A): One amu of an atom equal to exactly $1/12^{th}$ of mass of C-12 atom.
   Reason (R): Carbon -12 isotope was selected as standard.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion

9. Assertion: Atomicity of Sulphur is 8.
   Reason: 1 mole of an element contains 6.023×10^{23} atoms.

Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion

10. Assertion: 81g of Aluminium contains $3 \times 6.023 \times 10^{23}$ atoms.
    Reason: The mole is defined as the amount of substance which contains Avogadro's number of particles.
    a) Assertion is right Reason is wrong b) Assertion is wrong reason is right
    c) Reason explain asswertion. **d) Reason does not explain assertion**
    Reason: 81g of aluminium contains 3 moles of aluminium, which will contain $3 \times 6.023 \times 10^{23}$ atoms.

11. Assertion: Homoatomic molecules are made of atoms of the same elements.
    Reason: H_2O consists of hydrogen and oxygen.
    a) Assertion is right Reason is wrong b) Assertion is wrong reason is right
    c) Reason explain asswertion. **d) Reason does not explain assertion.**
    Reasons: there are two different statements H_2O is example for heterogeneous molecules.

Find the ODD one out;

1. N_2, CH_4, SO_3, H_2O

Ans: N_2 - The first one is homoatomic and other are heteroatomic molecules.

8. PERIODIC CLASSIFICATION OF ELEMENTS

I. Choose the best answer:

1. The number of periods and groups in the periodic table are_____.

a) 6,16 b) 7,17
c) 8,18 **d) 7,18**

2. The basis of modern periodic law is_____.
a) atomic number b) atomic mass
c) isotopic mass d) number of neutrons

3. _____ group contains the member of halogen family.
a) 17^{th} b) 15^{th}
c) 18^{th} d) 16^{th}

4. _____ is a relative periodic property
a) atomic radii b) ionic radii
c) electron affinity **d) electronegativity**

5. Chemical formula of rust is _____.
a) $FeO.xH_2O$ b) $FeO_4.xH_2O$
c) $Fe_2O_3.xH_2O$ d) FeO

6. In the alumino thermic process, the role of Al is _____.
a) oxidizing agent **b) reducing agent**
c) hydrogenating agent d) sulphurising agent

7. The process of coating the surface of metal with a thin layer of zinc is called_____.
a) painting b) thinning
c) galvanization d) electroplating

8. Which of the following have inert gases 2 electrons in the outermost shell.
a) He b) Ne
c) Ar d) Kr

9. Neon shows zero electron affinity due to _____.
a) stable arrangement of neutrons **b) stable configuration of electrons**
c) reduced size d) increased density

10. _____ is an important metal to form amalgam.
a) Ag **b) Hg**
c) Mg d) Al

11. Which of the following is the pair of shortest and longest periods in the modern periodic table?
a) 1^{st}, 2^{nd} b) 2^{nd}, 3^{rd}
c) 5^{th}, 7^{th} d) 1^{st}, 6^{th}

12. Pick the corret order on decreasing trend of atomic size.
a) Mg, Mg^+, Mg^{2+} b) Mg^+, Mg^{2+}.Mg
c) Mg^{2+},Mg^+, Mg d) Mg^{2+},Mg,Mg^+

13. Among the halogens which one is most electro-negative?
a) Iodine b) Chlorine
c) Bromine **d) Fluorine**

14. The acid which makes iron passive is _____
a) Conc. HCI b) Conc. H_2SO_4
c) Conc.HNO_3 d) Conc. HF

15. The green layer found on the copper vessel is due to the formation of _____
a) basic copper carbonate b) cupric oxide
c) cuprous oxide d) copper chloride

16. The number of neutrons in $_8O^{16}$ is _____
a) 8 b) 16 c) 32 d) 24

17. Modern periodic law is based on _____
a) atomic mass **b) atomic number**

c) number of neutrons d) both a&b

18. The first period of the modern periodic table has _____ elements.
    a) 1 **b) 2** c) 3 d) 8
19. The number of elements present in sixth period of modern periodic table is _____
    a) 8 b) 18 c) 16 **d) 32**
20. Pottassiium belongs to _____ period.
    a) first b) second
    c) third **d) fourth**
21. Modern periodic table contains _____ groups.
    a) 9 b) 32 **c) 18** d) 64
22. Noble gases belong to group _____
    a) 14 b) 15 c) 17 **d) 18**
23. Which among the following are periodic properties?
    a) Ionisation energy b) atomic radius
    c) electronegativity **d) all the above**
24. The distance from the centre of the nucleus to the outer most electron in an ion is termed as _____ radii.
    a) atomic **b) ionic**
    c) covalent d) both b&c
25. When an electron adds on to F atom, it becomes
    a) F^- b) F^+
    c) F_2 d) F^o
26. Arrange the following in the increasing order of the size Cl^-, Cl, Cl^+
    a) $Cl^- < Cl^+ < Cl$ b) $Cl_4 < Cl^- < Cl^+$
    c) $Cl^+ < Cl < Cl^-$ d) $Cl^+ < Cl^- < Cl$
27. As the positive charge increases, the size of the cation _____
    a) decreases b) increases
    c) remains constant d) first increases and then decreases
28. Electronegativity values are based on _____
    a) bond energy b) electron affinity
    c) ionization energy **d) all the above**
29. Electronegativity values of Na and Cl are 0.9 nd 3.0 respectively predict the nature of bonding.
    a) Ionic b) Covalent
    c) Coordinate d) Metallic
30. The process of extracting the ore from the earth's crust is _____
    a) metallurgy **b) mining**
    c) smelting d) leaching
31. Slag is
    a) metal +ore b) ore + gangue
    c) flux + gangue d) ore +flux
32. Metals are _____
    a) Electro positive b) Electronegative
    c) Both a&b d) neither a nor b
33. Which among the following are the ores of aluminium?
    i) bauxite ii) cryolite iii) corundum.
    a) both i & ii b) only
    c) only iii **d) i, ii and iii**
34. The process of extraction of aluminium from bauxite is called _____ process.

a) Hall's **b) Baeyer's**
c) Smelting d) Calcination

35. The chemical formula of sodium meta aluminate is _____
a) $NaAlO_2$ b) Na_2AlO_2
c) $NaAl_2O_2$ d) $Na_2Al_2O_3$
36. The chief ore of copper is _____
a) copper pyrites b) copper glance
c) cyprite d) rupy copper
37. Blister copper contains_____
a) 50% pure copper b) 99% pure copper and 1% impurities.
c) 98% pure copper and 2% impurities d) 75% pure copper and 25% impurities
38. The chemical symbol of iron is _____
a) I b) Ir
c) FE **d) Fe**
39. The carbon content in wrought iron is _____
a) 0.25 -2% b) 0.25-17%
c) 2-3.5% d) 3-4.5%

II. Fill in the blanks

1. If the electronegativity difference between two bonded atoms in a molecule is greater than 1.7, the nature of bonding is **ionic**.
2. **6^{th}** is the longest period in the periodical table.
3. **Atomic number** forms the basis of modern periodic table.
4. If the distance between two Cl atoms in Cl2 molecule is 1.98Å, then the radius of Cl atom is **0.99Å**
5. Among the given species A–,A+, and A, the smallest one in size is **A^+**
6. The scientist who propounded the modern periodic law is **Henry Moseley**
7. Across the period, ionic radii **decreases** (increases,decreases).
8. **Lanthanides** and **Actinides** are called inner transition elements.
9. The chief ore of Aluminium is **Bauxite**
10. The chemical name of rust is **hydrated ferric oxide**.
11. The symbol of an element is Uno; its atomic number is **108**
12. According to Mendeleev's periodic table, the physical and chemical properties of elements are periodic function of their **atomic mass**.
13. Horizontal rows in periodic table are called **periods**.
14. The shortest period in the modern peridoci table is **first** period.
15. Period 5 consist of **8** normal elements and **10** transition elements.
16. Vertical columns in the periodic table are called **groups**.
17. Lanthanides and Actinides are called **inner transition elements**.
18. **Electronic configuration** of elements explains periodic recurrence of physical and chemical properties.
19. E, Ci, Br, I and At are collectively known as **halogens**.
20. Oxygen family is also known as **Chalcogens**.
21. Atomic radius in metal atoms is known as **metallic radius**.
22. Atomic radii **increases** down the group.
23. When a neutral atom loses an electron, it forms a **cation**.
24. The anion is **larger** than its neutral atom.
25. Unit of ionization energy is **KJ/mol**
26. Ionization energy **increases** along the period and **decreases** down the grop in peridoci table.
27. The scale used to determine electronegativity is called as **pauling scale.**

28. **Electronegativity** is the periodic property which is used to predict the nature of bonding between atoms in a molecule.
29. The process of reducing the roasted metallic oxide to metal is called **smelting**.
30. The element with atomic number 13 is **aluminium**.
31. Chemical formula of bauxite is **Al_2O_3, $2H_2O$**
32. **Aluminium** is silvery white metal.
33. When aluminium is used as a reducing agent, the process is called **aluminothermic** process.
34. The black oxide of copper is **CuO (Copper (II) Oxide)**
35. Iron containing 2 -4.5% of carbon is called **pig iron.**
36. **Copper** metal is alloyed with gold and silver for making coins and jewels.
37. **Silver tin amalgam** is used for fental filling.
38. Brass is an alloy of **Zinc and Copper**
39. **Aluminium** is the metal widely used for anodizing.

III. Match the following

A. Match the following

1. Galvanisation	-	a) Noble gas elements
2. Calcination	-	b) Coating with Zn
3. Redox reaction	-	c) Silver-tin amalgam
4. Dental filling	-	d) Alumino thermic process
5. Group 18 elements	-	e) Heating in the absence of air

Ans: 1-b; 2-e; 3-d; 4-c; 5-a

B. Match the following

1. First	-	a) 18
2. Third	-	b) 32
3. Fourth	-	c) 2
4. Sixth	-	d) 8

Ans: 1-c; 2-d; 3-a; 4-b

C. Match the following

1. Alkali metal	-	a) 15
2. Transition metal	-	b) 16
3. Nitrogen	-	c) 1
4. Chalcogen	-	d) 3-12

Ans: 1-c; 2-d; 3-a; 4-b

D. Match the following

Ore		**Concentration methods**
1. SnO_2	-	a) Hydraulic washing
2. Fe_2O_3	-	b) Leaching
3. ZnS	-	c) Magnetic separation
4. Al_2O_3, $2.H_2O$	-	d) Forth Flotaion

Ans: 1-c; 2-a; 3-d; 4-b

E. Match the following

Metal		**Colour**
1. Copper	-	a) Silvery white
2. Iron	-	b) Reddish brown
3. Aluminium	-	c) Greyish white

Ans: 1-b; 2-c; 3-a

F. Match the following

Type of iron	**Uses**

1. Pig iron - a) transmission cables
2. Steel - b) Electromagnets
3. Wrought iron - c) Man hole cover

Ans: 1-c; 2-a; 3-b

G. Match the following

Alloys		**Uses**
1. Bronze	-	a) (Al, Mg)
2. Magnalium	-	b) (Fe, C, Ni, Cr)
3. Stainless steel	-	c) (Fe, C,Ni)
4. Nickel steel	-	d) (Cu, Sn)

Ans: 1-d; 2-a; 3-b; 4-c

H. Match the following

1. Clay - a) $CaCO_3$
2. Marble - b) HgS
3. Cinnabar - c) $ZnCO_3$
4. Calamine - d) NaCl
5. Rock salt - e) $Al_2O_3 . 2SiO_2. 2H_2O$

Ans: 1-e; 2-a; 3-b; 4-c; 5-d

I. Match the following

A	**B**	**C**
1. Copper	a) Duralumin	A) Fe,C, Ni
2. Aluminium	b) Nickel steel	B) Cu, Zn
3. Iron	c) Brass	C) Al, Mg, Mn, Cu

Ans: 1-c-B; 2-a-C; 3-b-A

J. Match the following

1. Pig iron - a) 0.25%-2% carbon
2. Steel - b) 2%-4.5% carbon
3. Wrought iron - c) Propeller
4. Bronze - d) < 0.25% carbon
5. Nickel steel - e) Bells

Ans: 1-b; 2-d; 3-a; 4-e; 5-c

IV. True or False: (If False give the correct statement)

1. Moseley's periodic table is based on atomic mass.
   Ans: False. Moseley's periodic table is based on atomic **number**.
2. Ionic radius increases across the period from left to right.
   Ans: False. Ionic radius **decreases** across the period from left to right.
3. All ores are minerals; but all minerals cannot be called as ores;
   Ans: True
4. Al wires are used as electric cables due to their silvery white colour.
   Ans: False. Al wires are used as electric cables **as they are good conductors**.
5. An alloy is a heterogenous mixture of metals.
   Ans: False. An alloy is a **homogeneous** mixrue of metals.
6. The element with atomic number 54 belongs to period 5 of the periodic table.
   Ans: True.
7. Electron affinity is not a periodic property.
   Ans: False. Electron affinity is a **periodic property**.
8. If the electronegativity difference between two elements is less than 17 the bond is 50% ionic and 50% covalent.

Ans: False. If the electronegativity difference is less than **1.7** the bond is covalent.

9. Oxide ores are concentrated by gravity separation method.
   Ans: True.
10. All metals are solids in room temperature.
    Ans: False. Metals like mercury and gallium are liquids at room temperature.
11. Roasting is the process in which the ore is heated in the presence of excess air.
    Ans: True
12. Aluminium is very good oxidizing agent.
    Ans: False. Aluminium is very good **reducing** agent.

V. A. Assertion and Reason

Answer the following questions using the data given below:

i) A and R are correct, R explains the A.
ii) A is correct, R is wrong.
iii) A is wrong, R is correct.
iv) A and R are correct, R doesn't explains A.

1. Assertion : The nature of bond in HF molecule is ionic
   Reason : The electronegativity difference between H and F is 1.9
   Ans: i) A and R are correct, R explains the A.
2. Assertion : Magnesium is used to protect steel from rusting
   Reason : Magnesium is more reactive than iron

Ans: iii) A is wrong, R is correct.

3. Assertion : An uncleaned copper vessel is covered with greenish layer.
   Reason : copper is not attacked by alkali
   Ans: i) A and R are correct, R explains the A.

V. B. Assertion and Reason

Answer the following questions using the data given below:

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is true but Reason is false
d) Assertion is false but Reason is true

4. Assertion: $I.E_1 > I.E_2 > I.E_3$
   Reason: Increase in nuclear charge shows strong force of attraction.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion
5. Assertion: Iron rod reacts with conc.HNO_3 to form iron nitrate.
   Reason: With conc.HNO_3 iron rod form Fe_3O_4
   Ans: d) Assertion is false but Reason is true
6. Assertion: Noble gases have zero electron affinity.
   Reason: Noble gases have completely filled electronic configuration.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion
7. Assertion: Copper pyrite is concentrated by froth flotation.
   Reason: Copper pyrite is an oxide ore.
   Ans: c) Assertion is true but Reason is false
8. Assertion: All is very good reducing agent.
   Reason: It is used in Alumini thermic process.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
9. Assertion: Copper is extensively used in manufacture of electric cables.
   Reason: Copper is a very poor conductor of heat and electricity.

Ans: c) Assertion is true but Reason is false

10. Assertion: Ionization energy increases down the group.
    Reason: Atomic size increases down the group.
    Ans: d) Assertion is false but Reason is true
11. Assertion: A greenish layer appears on copper vessels, if left uncleaned.
    Reason: It is due to the formation of layer of basic copper corbonate.
    Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion
12. Assertion: In thermite welding, aluminium powder and Fe_2O_3 are used.
    Reason: Aluminium powder is a strong reducing agent.
    Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion

VI. Analogy type questions: Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Metals of high reactivity : Electrolytic reduction, refining :: Metals of low reactivity : **Roasting**.
2. First group: Alkali metals :: Second group :**Alkaline earth metals**.
3. Blood pigment : Fe :: Bone, Teeth : **Ca**
4. Aluminium : Bauxite :: Copper: **Copper pyrite**.
5. Aluminium: 660°C :: Copper : **1356°C**

VII. To Find the Odd one out:

1. Cu_2O, Cu_2S, Al_2O_3, $CuFeS_2$
   Ans: Al_2O_3
2. Fe_2O_3, Fe_3O_4, FeS_2, Cu_2O
   Ans: Cu_2O
3. $ZnCO_3$, $Al_2O_3.\ 2H_2O$, $CaCO_3$, $FeCO_3$
   Ans: $Al_2O_3.\ 2H_2O$
4. He, H, Ne, Ar
   Ans: H
5. Titanium, Chromium, Gold, Manganese.
   Ans: Gold

9. SOLUTIONS

I. Choose the correct answer.

1. A solution is a _____ mixture.
   a) homogeneous b) heterogeneous
   c) homogeneous and heterogeneous d. non homogeneous
2. The number of components in a binary solution is _____
   a) 2 b) 3 c) 4 d) 5
3. Which of the following is the universal solvent?
   a) Acetone b. Benzene
   c) Water d) Alcohol
4. A solution in which no more solute can be dissolved in a definite amount of solvent at a given temperature is called _____
   a) Saturated solution b) Un saturated solution
   c) Super saturated solution d) Dilute solution
5. Identify the non aqueous solution.
   a) sodium chloride in water b) glucose in water
   c) copper sulphate in water **d) sulphur in carbon-di-sulphide**
6. When pressure is increased at constant temperature the solubility of gases in liquid _____.
   a) No change **b) increases**
   c) decreases d) no reaction

7. Solubility of NaCl in 100 ml water is 36 g. If 25 g of salt is dissolved in 100 ml of water how much more salt is required for saturation _____.
   a) 12g **b) 11g** c) 16g d) 20g
8. A 25% alcohol solution means
   a) 25 ml alcohol in 100 ml of water b) 25 ml alcohol in 25 ml of water
   c) 25 ml alcohol in 75 ml of water d) 75 ml alcohol in 25 ml of water
9. Deliquescence is due to _____
   a) Strong affinity to water b) Less affinity to water
   c) Strong hatred to water d) Inertness to water
10. Which of the following is hygroscopic in nature?
   a) ferric chloride b) copper sulphate penta hydrate
   c) silica gel d) none of the above
11. Sugar and coper sulphate crystals are dissolved in water. The solution is called as ____
   a) binary **b) trinary**
   c) ternary d) quartenary
12. 40G of sodium chloride in 100g of water at 25° C forms _____ solution.
   a) Super saturated b) Unsaturated
   c) Saturated d) Both a&b
13. 8% of NaCl solution is
   a) 8g of NaCl in 100 g of water **b) 8g of NaCl in 92g of water**
   c) 92g of NaCl in 8g of water d) 92g of NaCl in 100g of water
14. Which vitriol is _____
   a) $CaSO_4.7H_2O$ b) $MgSO_4.\ 7H_2O$
   c) $K_2SO_4.7H_2O$ **d) $ZnSO_4.7H_2O$**
15. Anhydrous copper sulphate is _____ in colour.
   a) blue b) bluish green
   c) colourless d) black
16. Hygroscopic substances are used as _____ agents.
   a) oxidizing b) reducing
   c) decarbocyleting **d) drying**
17. Solubility of a solute is governed by
   a) nature of solute and solvent b) temperature
   c) pressure **d) all the above**
18. Under which of the following cases, dissolution of sugar will be rapid?
   a) sugar crystal in hot water b) sugar crystal in cold water
   c) powdered sugar in hot water d) powdered sugar in cold water.
19. A beaker contains a solution of copper sulphate, precipitation of copper sulphate takes place when small amount of it added to _____ solution.
   a) saturated b) super saturated
   c) unsaturated d) concentrated
20. Quick lime is dissolved in water is a _____ process.
   a) exothermic b) endothermic
   c) reversible d) both a&b
21. Example for solid in solid _____
   a) soda water b) camphor in air
   c) charcoal **d) alloy**
22. In exothermic process as the temperature increases, solubility of the salt is _____
   a) decreases b) increases

c) no change d) increase nad then remains constant.

23. The solubility of gases in liquid increases with _____
    a) increased volume **b) increased pressure**
    c) decreased pressure d) none of these
24. Salt solution containing common salt in water is an example for _____
    a) binary solution b) trinary solution
    c) suspension d) colloidal solution
25. The number of components in a binary solution is _____
    a) one **b) two**
    c) three d) four
26. Which is a non-aqueous solution?
    a) sugar in water b) common salt in water
    c) sulphur in carbon disulphide d) none
27. Non-aqueous solvent is _____
    a) benzene b) ether
    c) CS_2 **d) all the above**
28. Which of the following is a saturated solution?
    a) 5g NaCl in 100g water b) 10g NaCl in 100g water
    c) 20g NaCl in 100g water **d) 36g NaCl in 100g water**
29. In which of the following solutions, both solute and solvent are solids?
    a) cork b) cheese
    c) alloys d) smoke
30. An example for a solution containing liquid solute in gas solvent is _____
    a) soda water **b) cloud**
    c) cork d) smoke
31. Which of the following factors affect solubility?
    a) temperature b) pressure
    c) narure of solute and solvent **d) all the above**
32. Solubility of KNO_3 _____with the increases in temperature.
    a) increases b) decreases
    c) remains constant d) none of these.
33. Solubility of CaO _____ with the increasesin temperature.
    a) increases **b) decreases**
    c) remains constant d) none of theses
34. Solubility of CO_2 gas in water _____ with the increase in pressure.
    a) increases b) decreases
    c) remains constant d) none of these
35. Which of the following is a dehydrating agent (absorbs moistone)
    a) sodium hydroxide **b) anhydrous calcium chloride**
    c) sugar d) none of these

II. Fill in the blanks

1. The component present in lesser amount, in a solution is called **Solute**.
2. Example for liquid in solid type solution is **mercury with sodium (amalgam)**
3. Solubility is the amount of solute dissolved in **100** g of solvent.
4. Polar compounds are soluble in **polar** solvents
5. Volume persentage decreases with increases in temperature because **of expansion of liquids.**
6. Iodine dissolved in carbon tetrachloride is an example of **non aqueous solution**.
7. The effect of pressure on the solubility of a gas in liquid is given by **Henry's law**.

8. Volume percentage decreases with **increase** in temperature.
9. Blue vitriol contains **5** molecules of water of crystalisation.
10. Blue vitriol is **$CuSO_4 .5H_2O$**
11. Magnesium sulphate heptahydrate is called **Epsom salt**.
12. Deliquescent substances are **crystalline solids**.
13. Conc H_2SO_4 is **hygroscopic** in nature.
14. Caustic potash is an example of **deliquescent** substance.
15. The number of water molecules found in the crystalline substance is called **water of crystallisation**.
16. The substance present in lesser amount, in a solution is called **solute**.
17. A soulution that contains more solute than the saturated solution at a given temperature **super saturated solution**
18. Benzene is an example of **non aqueous solvent**.
19. Molecular formula of white vitriol is **$ZnSO_4. 7H_2O$**
20. Substances are solids that absorb moisture from atmosphere, they dissolve in the absorbed water and form solution is called **deliquescent substances**.
21. The colour of Iron (II) sulphate is **green**.
22. Example of liquid in gas **cloud**.
23. In endothermic process solubility **increases** with increase in temperature.
24. In exothermic process solubility **decreases** with increase in temperature.
25. A solution containing less amount of solute is known as **dilute solution**.
26. Concentration of a solution is amount of solute dissolved ii **solvent**.
27. **Homogeneous** state is in which two or more substances are uniformly present in the mixture.
28. **Solution** is a homogeneous mixture of two mor substances.
29. The solution containing two components is called **binary solution**.
30. Salt +water= **salt solution**.
31. True solution is a **homogeneous** mixture.
32. Polar compound dissolves in **polar solvent.**
33. Polar compounci is in soluble in **non-polar solvent**.
34. Give an example for solid in gas? **Smoke**.
35. Give au example for liquid in liquid? **Milk**.
36. Give and example of liquid in gas? **Cloud**.
37. The number of components in a binary solution are/is **two**.
38. The mixture oi gases used by deep-sea diver is **helium-oxygen**.
39. When we burn wood, the smoke released is a mixture of solid carbon and gases like **CO_2 & CO**
40. Air is a mixture of gases like **oxygen, nitrogen, carbon dioxide** and other gases.
41. Sulphur dissolves in **carbon disulphide**.

III. Match the following

A. Match the following

1. Blue vitriol – a) $CaSO_4 .2H_2O$
2. Gypsum – b) CaO
3. Deliquescence – c) $CuSO_4.5H_2O$
4. Hygroscopic – d) NaOH

Ans: 1-c; 2-a; 3-d; 4-b

B. Match the following

Solution		**Example**
1. Liquid in solid	-	a) smoke
2. Liquid in gas	-	b) soda water
3. Gas in liquid	-	c) amalgam

4. Solid in gas - d) cloud

Ans: 1-c; 2-d; 3-b; 4-a

C. Match the following

Common name		**Molecular formula**
1. Epsom salt	-	a) $ZnSO_4.\ 7H_2O$
2. White vitriol	-	b) $FeSO_4.\ 7H_2O$
3. Green vitriol	-	c) $CaSO_4.2H_2O$
4. Gypsum	-	d) $MgSO_4.7H_2O$

Ans: 1-d; 2-a; 3-b; 4-c

D. Match the following

1. Solid-solid	-	a) Helium –oxygen mixture
2. Liquid-liquid	-	b) Alloys
3. Gas-gas	-	c) Sugar solution
4. Solid –liquid	-	d) milk

Ans: 1-b; 2-d; 3-a; 4-c

E. Match the following

1. Water	-	a) Carbon dis-sulphide
2. Sulphurdissolved	-	b) Solubility
3. Solute and solvent	-	c) Carbonated beverages
4. Aquatic animals	-	d) Solvent
5. Gas in liquids	-	e) Cold regions.

Ans: 1-d; 2-a; 3-b; 4-e; 5-c

IV. True or False: (If false give the correct statement)

1. Solutions which contain three components are called binary solution.
   Ans: False. Solutions which contain three components are called **Trinary** solution.
2. In a solution the component which is present in lesser amount is called solvent.
   Ans: True
3. Sodium chloride dissolved in water forms a non-aqueous solution.
   Ans: True
4. The molecular formula of green vitriol is $MgSO_4.7H2O$
   Ans: False. The molecular formula of green vitriol is $MgSO_4.7H_2O$
5. When Silica gel is kept open, it absorbs moisture from the air, because it is hygroscopic in nature
   Ans: True.
6. Sea water is an example of solution.
   Ans: True
7. Super saturated solutions are hightly stable.
   Ans: False. Super saturated solutions are **unstable**.
8. The solution with higher amount of solute is called a dilute solution.
   Ans: False. The solution with higher amount of solute is called a **concentrated solution.**
9. In exothermic process, solubility decreases with increase in temperature.
   Ans: True
10. Mass percentage is independent of temperature.
    Ans: True
11. Deliquescent substances do not change its state on exposure to air.
    Ans: False. Deliquescent substances **change** its state on exposure to air.
12. The common rule for solubility is “like dissolves like”.
    Ans: True
13. Volume percentage is expressed when solute is a solid and solved is a liquid.

Ans: False. Volume percentage is expressed when solute is a **liquid and solvent**.

14. In ointments, the concentration of solutions is expressed as W/W.
    Ans: True
15. If few drops of water is added to anhydrous $CuSO_4$, it turns blue in colour.
    Ans: True
16. When we burn wood, the smoke released is a mixute of liquid.
    Ans: False. When we burn wood, the smoke released is a **mixute of solids**.
17. Air is a mixture of gases like nitrogen, oxygen, carbon dioxide and other gases.
    Ans: True
18. Non-polar compounds are soluble in non-polar solvents.
    Ans: True
19. Mass percentage is expressed as W/W.
    Ans: True

V. Assertion and Reason:

a) Both A and R is true and R is the correct explanation of A.
b) Both A and R is true but R is not the correct explanation of A.
c) A is true but R is false.
d) A is false but R is true.

1. Assertion: Air is a solution.
   Reason: It is ahomogenous mixture of nitrogen, oxygen, carbondioxide and other gases.
   Ans: a) Both A and R is true and R is the correct explanation of A.
2. Assertion: Sulphur dissolves in water.
   Reason: Non polar substances are soluble in non polar solvents.
   Ans: d) A is false but R is true.
3. Assertion: Life under water is comparatively more in cold regions.
   Reason: Solubility of gases in liquids decrease with increase in temperature.
   Ans: a) Both A and R is true and R is the correct explanation of A.
4. Assertion: Sodium chloride (table salt) is dissolved in water.
   Reason: it is a aqueous solution.
   Ans: a) Both A and R is true and R is the correct explanation of A.
5. Assertion: When silica gel is kept open, it absorbs moisture from the air.
   Reason: It is deliquescent nature.
   Ans: c) A is true but R is false.

VII. Analogy type questions: Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Aqueous solution : Sugar solution :: Non-aqueous solution: **Benzene.**
2. Homogeneous solution: Salt +Water :: Heterogeneous solution: **Sand+Water**
3. Higher amount of solute : Concentrated solution :: Lesser amount of solute : **dilute solution**.
4. Copper sulphate is heated : anhydrous (colour less) :: Copper sulphate is cooled: **Hydrated blue colour**.

10. TYPES OF CHEMICAL REACTIONS

I. Choose the correct answer.

1. $H_{2(g)} + Cl_{29(g)} \rightarrow 2HCl_{(g)}$ is a
   a. Decomposition Reaction **b. Combination Reaction**
   c. Single Displacement Reaction d. Double Displacement Reaction
2. Photolysis is a decomposition reaction caused by _____
   a. heat b. electricity
   c. light d. mechanical energy

3. A reaction between carbon and oxygen is represented by $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ + Heat. In which of the type(s), the above reaction can be classified?
   (i) Combination Reaction (ii) Combustion Reaction
   (iii) Decomposition Reaction (iv) Irreversible Reaction
   a. i and ii b. i and iv
   c. i, ii and iii **d. i, ii and iv**
4. The chemical equation $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} + 2NaCl_{(aq)}$ represents which of the following types of reaction?
   a. Neutralisation b. Combustion
   c. Precipitation d. Single displacement
5. Which of the following statements are correct about a chemical equilibrium?
   (i) It is dynamic in nature
   (ii) The rate of the forward and backward reactions are equal at equilibrium
   (iii) Irreversible reactions do not attain chemical equilibrium
   (iv) The concentration of reactants and products may be different
   a. i, ii and iii b. i, ii and iv
   c. ii, iii and iv d. i, iii and iv
6. A single displacement reaction is represented by $X_{(s)} + 2HCl_{(aq)} \rightarrow XCl2(aq) + H_{2(g)}$. Which of the following(s) could be X.
   (i) Zn (ii) Ag (iii) Cu (iv) Mg. Choose the best pair.
   a. i and ii b. ii and iii
   c. iii and iv **d. i and iv**
7. Which of the following is not an "element + element → compound" type reaction?
   a. $C_{(s)} + O_{2(g)} \rightarrow CO_{2(g)}$ b. $2K_{(s)} + Br_{2(l)} \rightarrow 2KBr_{(s)}$
   c. $2CO_{(g)} + O_{2(g)} \rightarrow 2CO_{2(g)}$ d. $4Fe_{(s)} + 3O_{2(g)} \rightarrow 2Fe_2O_{3(s)}$
8. Which of the following represents a precipitation reaction?
   a. $A_{(s)} + B_{(s)} \rightarrow C_{(s)} + D_{(s)}$ b. $A_{(s)} + B_{(aq)} \rightarrow C_{(aq)} + D_{(l)}$
   c. $A_{(aq)} + B_{(aq)} \rightarrow C_{(s)} + D_{(aq)}$ d. $A_{(aq)} + B_{(s)} \rightarrow C_{(aq)} + D_{(l)}$
9. The pH of a solution is 3. Its [OH–] concentration is
   a. 1×10^{-3} M b. 3 M
   c. 1×10^{-11} M d. 11 M
10. Powdered CaCO3 reacts more rapidly than flaky CaCO3 because of _____.
   a. large surface area b. high pressure
   c. high concentration d. high temperature
11. Which of the following information is not conveyed by a balanced chemical equation?
   a) physical states of reactants and products.
   b) symbols and chemicals formula of reactants and products.
   c) number of atoms/molecules of the reactants and product formed.
   d) feasibility of a chemical reaction.
12. The product formed when calcium oxide reacts with water is
   a) slaked lime b) carbon dioxide
   c) calcium oxide d) oxygen gas
13. The reaction between hydrogen and oxygen gas to form water is _____ reaction.
   a) combination b) redox
   c) exothermic d) all of these
14. An element 'A' on exposure to most air turns to form compound 'B' which is reddish brown. Identify 'A' and 'B'.
   a) 'A' is Ag, B is Ag_{25} b) 'A' is Cu, B is CuO

c) 'A' is Mg, B is MgO **d) 'A' is Fe, B is Fe_2O_3**

15. $CaCO_{3(s)}$ heat→$Ca_{(s)} + CO_{2(g)}$ The above thermal decomposition reaction is an _____ reaction.
a) endothermic b) exothermic
c) both a&b d) neither a nor b

16. Which among the following chemical reaction is an example of combination reaction?
i) $H_{2(g)} + Cl_{2(g)} \rightarrow 2HCl_{(g)}$ ii) $NaOH_{(aq)} + HCl_{(aq)} \rightarrow NaCl_{(aq)} + H_2O_{(l)}$
iii) $2Mg_{(s)} + O_{2(g)} \rightarrow 2MgO_{(s)}$ iv) $Zn_{(s)} + 2HCl_{(aq)} \rightarrow ZnCl_2 + H_{2(g)}$
a) only i **b) both i and iii**
c) only iii d) both i and ii

17. Match the list I with list II and select the correct answer using the code given below the lists.

List I	List II
A. Thgermolysis	1. 2AgBr --? AAg +Br
B. Photolysis	2. $HNO_3 + NH_4OH \rightarrow NH_4NO_3 + H_2O$
C. Electrolysis	3. $2HgO \rightarrow 2Hg + O_2$
D. Neutralization	4. $2NaCl \rightarrow 2Na + Cl_2$

	A	B	C	D
a)	4	1	2	3
b)	2	4	1	3
c)	**3**	**1**	**4**	**2**
d)	4	3	2	1

18. Pick out Compound +element → compound type of combination reaction
a) $PCl_5 \rightarrow PCl_3 + Cl_2$ b) $Mg + O_2 \rightarrow 2MgO$
c) $PCl_3 + Cl_2 \rightarrow PCl_5$ d) $2Na + Cl_2 \rightarrow 2NaCl$

19. Formation of ammonia from nitrogen and hydrogen is an examole of _____ reaction.
a) thermal decomposition **b) combination**
c) precipitation d) displacement

20. Decomposition reactions are brought about by _____
a) heat b) light
c) electricity **d) all the above**

21. When Zinc metal is placed in hydrochloric acid, the gas evolved is _____
a) CO b) CO_2 **c) H_2** d) H_2O

22. Pick out a chemical reaction which is not feasible.
a) $2NaCl \rightarrow 2Na + Cl_2$ b) $2NaCl + F \rightarrow 2NaF + Cl_2$
c) $2NaF + Cl_2 \rightarrow 2NaCl + F$ d) $NaOH + HCl \rightarrow NaCl + H_2O$

23. Pick out the metal that displaces hydrogen from hydrochloric acid.
a) Zinc b) Silver
c) Copper d) Gold

24. When a double displacement reaction takes place, one of the products must be
a) precipitate b) water
c) either a or b d) neither a nor b

25. $Pb(NO_3)_2 + 2KI \rightarrow PbI_2 +$ is a _____reaction.
a) neutralization **b) precipitation**
c) decomposition d) combustion

26. Heat is evolved during _____- reaction.
a) combination **b) combustion**
c) decomposition d) endothermic

27. Which among the following is not a balanced equation?

a) $Fe + Cl_2 \rightarrow FeCl_3$ b) $Zn + S \rightarrow ZnS$
c) $CaCO_3 \rightarrow CaO + CO$ d) $Fe + CuSO_4 \rightarrow FeSO_4 + Cu$

28. Which among the following factors affect the rate of a reaction?
    a) surface area of reactants b) pressure
    c) temperature **d) all the above**
29. The value of Ionic product of water at 25°C is _____
    a) 1.00×10^{14} **b) 1.00×10^{-14}**
    c) 1.00×10^{4} d) 1.00×10^{-4}
30. Ionic product of wate r is expressed
    a) $K_w = [H_3O^+] [OH^-]$ b) $K_w = [H^+] [OH^-]$
    c) both a&b d) neither a nor b
31. Acids have pH
    a) less than 7 b) greater than 7
    c) equal to 7 d) less tha 14
32. Chemically rust is
    a) hydrated ferrous oxide b) ferrous oxide
    c) hydrated ferric oxide d) ferric oxide
33. When copper sulphate is dissolved in water, the solution would be
    a) colorless **b) blue**
    c) green d) brown
34. Which of the following reactions is not fessible?
    a) $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$ **b) $2Ag + Cu(NO_3)_2 \rightarrow AgNo_3 + Cu$**
    c) $Fe + CuSO4 \rightarrow FeSO_4 + Cu$ d) $Mg + 2HCl \rightarrow MgCl_2 + H_2$
35. Copper displaces – metal from its solution.
    a) Zn b) Al **c) Ag** d) all the above

II. Fill in the blanks:

1. A reaction between an acid and a base is called **neutralization**.
2. When lithium metal is placed in hydrochloric acid, **hydrogen** gas is evolved.
3. The equilibrium attained during the melting of ice is known as **physical equilibrium**.
4. The pH of a fruit juice is 5.6. If you add slaked lime to this juice, its pH **increases** (increse/decrese)
5. The value of ionic product of water at 250 C is **1.00×10^{-14}**
6. The normal pH of human blood is **7.35 – 7.45**.
7. Electrolysis is type of **decomposition** reaction
8. The number of products formed in a synthesis reaction is **one**.
9. Chemical volcano is an example for **decomposition** type of reaction
10. The ion formed by dissolution of H+ in water is called **hydronium ion**.
11. Water freezes into ice is an example **physical** change.
12. When reate of backward reaction in equal to rate of forward reaction, the stage is called **equilibrium**
13. The unit of ionic product of water is **mol^2dm^{-6}**
14. pH ofvinegar is **3**
15. The pH value of milk of magnesia is 10. It is **basic** in nature.
16. The substance those formed as aresult of the reaction are called **products**.
17. A chemical raction which involves addition of oxygen is called as **oxidation**.
18. Single product formed from two or more reactions is known as **combination reactions**.
19. **pH paper** is used to measure pH value of a solution in school laboratory.
20. Single compound breaks down to produce two or more substance is known as **decomposition**.
21. **Potassium** is the most reactive metal.
22. Any reaction that produces a precipitate is called a **precipitation reaction**.

23. The chemical reactions which take place with the evolution of heat energy are called **exothermic** reaction.
24. Chemical formula for marble is **$CaCO_3$**
25. pH scale was introduced by **S.P.L. Sorenson**
26. pH +POH = **14**
27. pH of lemon juice is **2**
28. pH of stomach fluid is approximately **2.0**
29. Human blood pH range is **7.4**
30. Rain water is **neutral**.
31. If rain water is polluted by **SO_2 and NO_2** acid rain occurs.
32. pH of an acidic solution is **<7**
33. When solid potassium reacts with liquid water it produces **hydrogen and potassium hydroxide**.
34. $S_{(s)} + O_{2(g)} \rightarrow$ **$SO_{2(g)}$**
35. LPG is a mixture of hydrocarbon gases like **propane, butane, propylene.**
36. **Hydrogen peroxide** is poured on a wound it decomposes into water and oxygem.
37. The reaction that cannot be reversed is called **irreversible reaction.**
38. pH plays a **vital role** in everyday life.
39. **Pure water** is a weak electrolyte.
40. A chemical change is a change in which one or more **new substances** are foemed.
41. All photo decomposition reaction are **endothermic** reactions.
42. Neutralisation prevents **tooth decay**.

III. Match the following

A. Match the following

1. Identify the types of reaction

REACTION	**TYPE**
1. $NH_4OH_{(aq)} + CH_3COOH_{(aq)} \rightarrow CH_3COONH_{4(aq)} + H_2O_{(l)}$	- a) Single Displacement
2. $Zn_{(s)} + CuSO_{4(aq)} \rightarrow ZnSO_{4(aq)} + Cu_{(s)}$	- b) Combustion
3. $ZnCO_{3(s)} + {}^{Heat} \rightarrow ZnO_{(s)} + CO_{2(g)}$	- c) Neutralization
4. $C_2H_{4(g)} + 4O_{2(g)} \rightarrow 2CO_{2(g)} + 2H_2O_{(g)}$ + Heat	- d) Thermal decomposition

Ans: 1- c; 2-a; 3-d; 4-b

B. Match the following

Compound		**Chemical formula**
1. Quick lime	-	a) $Ca(OH)_2$
2. Slaked lime	-	b) NaCl
3. Marble	-	c) CaO
4. Rock salt	-	d) $CaCO_3$

Ans: 1-c; 2-a; 3-d; 4-b

C. Match the following

Identify the following as pH

Sample		**pH value**
1. Egg white	-	a) 2
2. Lemon juice	-	b) 9
3. Baking soda	-	c) 4.5
4. Milk of magnesia	-	d) 8
5. Sour milk	-	e) 10

Ans: 1- d; 2-a; 3-b; 4-e; 5-c

D. Match the following

1. $H_2S + Cl_2$	-	a) $CaO + CO_2$

2. $NaBr + AgNO_3$ - b) $2HCl + S$
3. $CaCO_3$ - c) $2H_2O$
4. $2H_2 + O_2$ - d) $AgBr + NaNO_3$

Ans: 1-b; 2-d; 3-a; 4-c

E. Match the following

1. LPG - a) heat is evolved
2. Exothermic - b) butane
3. Soft drinks - c) alkaline soil
4. Stomach - d) CO_2
5. Citrus fruits - e) Hydrochloric acid

Ans: 1-b; 2-a; 3-d; 4-e; 5-c

F. Match the following

1. Combustion - a) Calcium carbonate
2. White wash - b) exothermic
3. Compound - c) hydrocarbon
4. Burning petrol - d) universal indicator
5. pH of a solution - e) NaCl

Ans: 1-b; 2-a; 3-e; 4-c; 5-d

IV. True or False: (If false give the correct statement)

1. Silver metal can displace hydrogen gas from nitric acid.
   Ans: False. Silver metal **will not be** displace hydrogen gas from nitric acid.
2. The pH of rain water containing dissolved gases like SO_3, CO_2, NO_2 will be less than 7.
   Ans: True
3. At the equilibrium of a reversible reaction, the concentration of the reactants and the products will be equal.
   Ans: False. At the equilibrium of a reversible reaction, **there is no change in the concentration** of the reactants and the products.
4. Periodical removal of one of the products of a reversible reaction increases the yield.
   Ans: True
5. On dipping a pH paper in a solution, it turns into yellow. Then the solution is basic.
   Ans: False. On dipping a pH paper in a solution, it turns into yellow. Then the solution is **natural**.
6. All irreversible reactions are combustion.
   Ans: False. Combustion reactions are reversible reactions.
7. pH of stomach fluid is approximately 2.0.
   Ans: True.
8. Chemical reaction involves breaking of old bonds and formation of new bonds.
   Ans: True
9. When a chemical bond is formed, energy is absorbed.
   Ans: False. When a chemical bond is formed, energy is **released**
10. In a chemical reaction, the number of atoms of reactants and that of th products must be equal.
    Ans: True.
11. Decomposition reaction is the opposite of combination reaction.
    Ans: True
12. Chemical formula of marble is $Ca(OH)_2$
    Ans: False. Chemical formula of marble is $CaCo_3$
13. $A + BC \rightarrow AC + B$ is a double displacement reaction.
    Ans: False. $A + BC \rightarrow AC + B$ is a **displacement** reaction.
14. Lead displaces copper from copper sulphate solution.

Ans: True

15. Neutralization reaction is a type of double displacement reaction.
    Ans: True
16. Combustion reactions are exothermic.
    Ans: True
17. Recharging of mobile battery is a irreversible reaction.
    Ans: False. Recharging of mobile battery is a **reversible** reaction.
18. If the reactants are gases, increasing their pressure decreases the reaction rate.
    Ans: False. If the reactants are gases, increasing their pressure **increases** the reaction rate.
19. At equilibrium, there is no change in the concentration of both the reactants and products with time.
    Ans: True
20. Both physical and chemical changes attain equilibrium.
    Ans: True
21. The pH of baking soda is 9; it is acid in natural.
    Ans: False. The pH of baking soda is 9; It is **basic** in natural.
22. If pH of rain water is approximaterly 7, then it is called acid rain.
    Ans: False. If pH of rain water is approximaterly 7, then it is called **rain**.

V. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as.

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is correct but Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Combustion reactions are also called as an exothermic oxidation reaction.
   Reason : In these reactions oxygen is added and heat energy is released.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
2. Assertion: Aluminium hydroxide is not an alkali.
   Reason : An alkali is a base which dissolves in water.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
   Reason: (Aluminium hydroxide does not dissolve in water)
3. Assertion: Colour of copper sulphate change when an iron nail kept in it.
   Reason : Copper is displaced by iron and iron sulphate is formed.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

11. CARBON AND ITS COMPOUNDS

I. Choose the best answer.

1. The molecular formula of an open chain organic compound is C3H6. The class of the compound is
   a. alkane **b. alkene**
   c. alkyne d. alcohol
2. The IUPAC name of an organic compound is 3-Methyl butan-1-ol. What type compound it is?
   a. Aldehyde b. Carboxylic acid
   c. Ketone **d. Alcohol**
3. The secondary suffix used in IUPAC nomenclature of an aldehyde is ____
   a. - ol b. – oic acid
   c. - al d. - one
4. Which of the following pairs can be the successive members of a homologous series?
   a. C_3H_8 and C_4H_{10} b. C_2H_2 and C_2H_4

c. CH_4 and C_3H_6 d. C_2H_5OH and C_4H_8OH

5. $C_2H_5OH + 3O_2 \rightarrow 2CO_2 + 3H_2O$ is a
   a. Reduction of ethanol **b. Combustion of ethanol**
   c. Oxidation of ethanoic acid d. Oxidation of ethanal
6. Rectified spirit is an aqueous solution which contains about _____ of ethanol
   a. 95.5 % b. 75.5 %
   c. 55.5 % d. 45.5 %
7. Which of the following are used as anaesthetics?
   a. Carboxylic acids **b. Ethers**
   c. Esters d. Aldehydes
8. TFM in soaps represents _____content in soap
   a. mineral b. vitamin
   c. fatty acid d. carbohydrate
9. Which of the following statements is wrong about detergents?
   a. It is a sodium salt of long chain fatty acids b. It is sodium salts of sulphonic acids
   c. The ionic part in a detergent is –SO3 Na+ d. It is effective even in hard water.
10. Which among the following is/are the properties of organic compounds.
    i) are covalent in nature ii) exhibit isometism iii) have low melting and boiling point
    a) I and ii b) i and iii
    c) i , ii and iii d) only iii
11. Cyclobutane is an example of _____ compounds.
    a) a cyclic b) cyclic
    c) aromatic **d) alicyclic**
12. General molecular formula of alkynes is _____
    a) CnH_{2n+2} b) CnH_2n
    c) CnH_{2-n-2} d) CnH_{2n+1}
13. Ethene is an _____
    a) alkane **b) alkene**
    c) alkyze d) armatic hydrocarbon
14. Methylene group is
    a) CH_4 b) $–CH_3$
    c) $–CH_2-$ d) –CH-
15. Identify the ketone among the following
    a) CH_3COCH_3 b) CH_3CHO
    c) CH_3COOH d) CH_3COOCH_3
16. The organic compound contains 2 carbon atoms, the root word according IUPAC is
    a) Meth - **b) Eth -**
    c) Prop - d) But -
17. According to IUPAC rules, the secondary suffix used to represent carboxylic acid is _____
    a) al b) ol
    c) ate **d) oic**
18. the enzymes present in yeast is/are _____
    a) invertage b) zymase
    c) both a &b d) neither a nor b
19. Rectified spirit contains
    a) 95.5% of ethanol and 4.5% of water b) 100% pure alcohol
    c) 4.5% of ethanol and 95.5% of water d) 50% of ethanol and 50% of water

20. Alcohols +Acids $\xrightarrow{conc\ H_2SO_4}$ Esters. The reaction is _____
    a) Ester hydrolysis **b) Esterification**
    c) Dehydrogenation d) Oxidation
21. When ethanol reacts with acidified $K_2Cr_2O_7$ the orange color of $K_2Cr_2O_7$ changes to _____
    a) yellow b) red
    c) purple **d) green**
22. chemical formula of acetaldehyde is _____
    a) CH_3CHO b) Ch_3CH_2OH
    c) CH_3COOCH_3 d) CH_3-O-CH_3
23. Ethanol is used as _____
    a) a preservative for biolofical specimen b) an antifreeze
    c) an antiseptic **d) all the above**
24. Ethanoic acid turns
    a) red litmus blue **b) blue litmus red**
    c) red litmus green d) blue litmus green
25. Hard water contains salts of _____
    a) Ca and Mg b) Fe and Ca
    c) Cu and Fe d) Cu and Ca
26. Identify the product formed whe n ethanol reacts with sodium.
    a) Sodium acetate b) sodium ethanate
    c) sodium ethoxide d) sodium formate
27. Which of the unique feature (s) of Carbon enables it to form a large number of compounds?
    a) catenation b) covalency
    c) tetra valency **d) both (a) and (c)**
28. All the members of homologous series have the same.
    a) molecular formula b) physical Properties
    c) general formula d) all the above
29. What is the IUPAC name of $CH_3CH_2COCH_2$-CH_3?
    a) 1 - Pentanone b) 2 – Pentanone
    c) 3 - Pentanone d) 4 - Pentaone
30. Which of the following is formed when soap water acts on clothes to remove dirt or grease?
    a) acetic acid **b) Micelle**
    c) Ethyl alcohol d) all the above
31. Which one of the following changes blue litmus red?
    a) CH_3OH b) CH_3COCH_3
    c) CH_3COOH d) CH_3CHO
32. Ethyl alcohol is mainly manufactured by
    a) destructive distillation of wood. **b) fermentation of molasses**
    c) dehydrogenation d) Oxidation of ethane in tne presence of $K_2Cr_2O_7/H^+$
33. The organic acid present in Vinegar is _____ acid.
    a) rnethanolc **b) ethanoic**
    c) Propanoic d) Butanoic
34. The sodium salt of long chain fatty acid which helps in cleaning of clothes is _____
    a) vinegar b) detergent
    c) soap d) both (b) and (c)

II. Fill in the blanks

1. An atom or a group of atoms which is responsible for chemical characteristics of an organic compound is called **functional group**.
2. The general molecular formula of alkynes is **$C_n H_{2n-2}$**
3. In IUPAC name, the carbon skeleton of a compound is represented by **root word** (root word / prefix / suffix)
4. (Saturated / Unsaturated) **unsaturated** compounds decolourize bromine water.
5. Dehydration of ethanol by conc. Sulphuric acid forms **ethene** (ethene/ ethane)
6. 100 % pure ethanol is called **absolute alcohol**
7. Ethanoic acid turns **blue** litmus to **red**.
8. The alkaline hydrolysis of fatty acids is termed as **saponification**.
9. Biodegradable detergents are made of **straight** (branched / straight) chain hydrocarbons.
10. Benzene is an example of **aromatic** compound.
11. Alkanes are represented by the general molecular formula **CnH_{2n+2}**
12. The simplest alkane is **methane** CH_4.
13. The chemical properties of organic compounds are determined by their **functional** groups.
14. Members of a homologous series have similar **chemical** properties.
15. The principal source of butyric acid is **butter**.
16. Ethanol is manufactured by the fermentation of **molasses**.
17. Esters have a **fruity** odour.
18. The common name of ethanoic acid is **acetic** acid.
19. Ethanoic acid has a **sour** taste.
20. The gas formed dui ing the decarboxylation of sodium salt of ethanoix acid is **methane**.
21. **Ether** is used as an anaesthetic.
22. All the cooling oils and lipids contain **esters**.
23. 5odium salts of fatty acids are known as **hard soaps**.
24. The cleaning action of soap is reduced by **hard water**.
25. **Sodium sulphate and sodium silicate** are used to keep detergents dry
26. Total fatty matter (TFM) is used to assess the **quality** of soap.
27. Expansion of IUPAC is **International Union of Pure and Applied Chemistry**.
28. Expansion of TFM is **Total Fatty Matter**.
29. Soaps are sodium or potassium salts of some long chain **Carboxylic acid.**
30. Detergenis ale sodium salts of **sulphuric acid**.
31. 1UPAC name of the organic compound consist of **rootword, prefix and suffix**

III. Match the following

A. Match the following

1. Functional group –OH	-	a) Benzene
2. Heterocyclic	-	b) Potassium stearate
3. Unsaturated	-	c) Alcohol
4. Soap	-	d) Furan
5. Carbocyclic	–	e) Ethen

Ans: 1-c; 2- d; 3-e; 4-b; 5-a

B. Match the following

Types oranicx compounds		**Examples**
1) Carbo cyclic	-	a) Cyclo propane
2) Hetero cyclic	-	b) Benzene
3) Alicylic	-	c) Methane
4) Aromatic	-	d) Furan

Ans: 1-c; 2-d; 3-a; 4-b

C. Match the following

Functionla group		**Compound**
1) CHO	-	a) ester
2) > C= O	-	b) ether
3) -O –R	-	c) aldehyde
4) - $\overset{O}{\overset{\|\|}{C}}$-OR	-	d) ketone

Ans: 1-c; 2-d; 3-b; 4-a

D.Match the following

1) Butane	-	a) C_2H_2
2) Pentane	-	b) C_3H_4
3) Propyne	-	c) C_4H_{10}
4) Ethyne	-	d) C_5H_{10}

Ans: 1-c; 2-d; 3-b; 4-a

E. Match the following

1) Acetic acid	-	a) H COOH
2) Formic acid	-	b) $CH_3CH_2COCH_2CH_3$
3) Ethanol	-	c) CH_3COOH
4) 3 Pentanone	-	d) $CH_3CH_2CH_3$
5) Propane	-	e) CH_3CH_2OH

Ans: 1- c; 2-a; 3-e; 4-b; 5-d

IV. Assertion and Reason:

Answer the following questions using the data given below:

i) A and R are correct, R explains the A.

ii) A is correct, R is wrong.

iii) A is wrong, R is correct.

iv) A and R are correct, R doesn't explains A.

1. Assertion: Detergents are more effective cleansing agents than soaps in hard water.
   Reason: Calcium and magnesium salts of detergents are water soluble.
   Ans: i) A and R are correct, R explains the A.
2. Assertion: Alkanes are saturated hydrocarbons.
   Reason: Hydrocarbons consist of covalent bonds.
   Ans: iv) A and R are correct, R doesn't explains A.

IV.B. Assertion and Reason:

Answer the following questions using the data given below:

i) Both Assertion and Reason are true and R correct explanation of Assertion.

ii) Both Assertion and Reason are true and R not the correct explanation of Assertion.

.

iii) Assertion is true but Reason is false.

iv) Assertion is false but Reason is true.

3. Assertion: There are more than 5 million hydrocarbons.
   Reason: Carbon has unique properties such as catenation, tetra valency and multiple bonding.
   Ans: i) Both Assertion and Reason are true and Reason correct explanation of Assertion.
4. Assertion: Acetic acid turns blue litrous red.
   Reason it is a weak acid.
   Ans: ii) Both Assertion and Reason are true and Reason not the correct explanation of Assertion.
5. Assertion: Detergents are unbranched hydrocarbons.

Reason: It can be used in hard water and as softners.
Ans: iv) Assertion is false but Reason is true.

6. Assertion: The boiling point of n-butane is greater than that of methane.
   Reason: Boiling points of hydrocarbon increases with increase in number of carbon atom.
   Ans: i) Both Assertion and Reason are true and Reason correct explanation of Assertion.
7. Assertion: Functional group is responsible for the characteristic properties of the compounds.
   Reason: The chemical properties of organic compounds are determined by functional group.
   Ans: ii) Both Assertion and Reason are true and R not the correct explanation of Assertion.
8. Assertion: All living organisms are made of carbon atom. Carbon chemistry is also called as living chemistry.
   Reason: Carbon atom forms the building blocks of living organisms. These carbon atoms in combination with other atoms decide life on earth. Hence carbon chemistry is also called as living chemistry.
   Ans: i) Both Assertion and Reason are true and R correct explanation of Assertion.

V. State whether the following statement sare True or False. Correct the False Statement

1. Organic compounds are readily soluble in water.
   Ans: False. Organic compounds are mostlyreadily **insoluble** in water.
2. Alkenes are represented by the general molecular formula as C_nH_{2n}
   Ans: True
3. Esters are represented as R –CHO
   Ans: False. Esters are represented as **RCOOR**
4. Members of a homologous series contain same functional group.
   Ans: True
5. Red ants contain formic acid.
   Ans: True
6. Ethanol is reduced to ethanoic acid when treated with acidified $K_2Cr_2O_7$.
   Ans: False. Ethanol is oxidised to ethanoic acid when treated with acidified $K_2Cr_2O_7$.
7. Ethanol is used for coagulation rubber from latex.
   Ans: False. **Ethanoic acid** is used for coagulation rubber from latex.
8. Consumption of ethanol affects our central nervous system.
   Ans: True.
9. Methanol is formaldehyde.
   Ans: False. Methanal is formaldehyde.
10. Ethanoic acid is a strong acid.
    Ans: False Ethanoic acid is a **weak acid**.
11. Detergents are sodium salts of sulphonic acids.
    Ans: True
12. $CH_3COOH + NaOh \rightarrow CH_3COONa + H_2O$. The above reaction is an example of neutralization reaction.
    Ans: True
13. Successive members of homologous series differ by a methyl group ($-CH_3$)
    Ans: False. Successive members of homologous series differ by a methyl group (CH_2)
14. The IUPAC name of Ch_3CHO is ethanol.
    Ans: True

BIOLOGY

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

I. Choose the correct answer.

1. Casparian strips are present in the _____ of the root.

a) cortex
b) pith
c) pericycle
d) endodermis

2. The endarch condjtj0 is the characteristic feature of
a) root
b) stem
c) leaves
d) flower

3. The xylem and phloern arranged side by side on same radius is called _____
a) radial
b) aniphivasal
c) conjoint
d) None of these

4. Which is formed during anaerobic respiration
a) Carbohvdr ate
b) Ethyl alcohol
c) Aetyl CoA
d) Pyruvate

5. Kreb's cycle takes place in
a) chloropiast
b) mitochondrial matrix
c) stomata
d) nner mitochondria! membrane

6. Oxygen is produced at what point during photosynthesis?
a) when ATP is converted to ADP
b) when CO_2 is fixed
c) when H_2O is splitted
d) All of these

7. Amphivasal bundle belong to _____ type of vascular bundle.
a) concentric
b) collateral
c) conjoint
c) radial

8. Exarch and tetrarch xylem are a feature of _____
a) dicot stem
b) dicot leaf
c) monocot root
d) dicot root

9. The _____ is called starch sheath in a dicot stem.
a) epidermis
b) pericycle
c) endodermis
d) hypodermis

10. Protoxylem lacuna refers to a _____
a) thickening
b) arrangement of xylem
c) a cavity
d) exarch xylem

11. Mitochondria was discovered by _____
a) sachs
b) Kelvin
c) Melvin
d) kolliker

12. _____ are racket shaped particles seen in inner mitochondrial membrane.
a) Porin
b) ATP
c) Oxysome
d) Grana

13. Respiratory quotient for aerobic respiration is _____
a) 2
b) infinity
c) 1
d) 0

14. _____is the outer most layer.
(a) Stomata
b) Epidermis
c) Periderm
d) Skin

15. _____helps in transpiration.
a) stomata
b) epidermis
c) trichomes
d) root hairs

16. _____ help in absorption of water and minerals.
a) root hairs
b) stomata
c) epidermis
d) trichomes

17. _____ is the outermost layer of the root.

a) epiblema b) cortex
c) endodermis d) stele

18. Name the tissue present between the upper and lower epidermis.
    a) Lower epidermis tissue b) Pith
    c) Upper epidermis tissue **d) Mesophyll**
19. Who discovered light dependent photosynthesis?
    a) Robin Hill b) Nehemiah Grew
    c) Kolliker d) Melvin Calvin
20. Mitochondria contain _____ of protein.
    a) 70-80% b) 80-90%
    c) 60-70% d) 50-60%
21. Chloroplasts are _____ shaped organelles.
    a) disc b) round
    c) oval d) circle
22. The inner mitochondrial membrane gives rise to finger like projections called _____
    a) oxysomes b) matrix
    c) cristae d) stalk
23. Leucoplasts are _____ plastids.
    a) colourless b) yellow
    c) orange d) red

II. Fill in the blanks:

1. Cortex lies between **epidermal and vascular tissues**.
2. Xylem and phloem occurring on the same radius constitute a vascular bundle called **conjoint**.
3. Glycolysis takes place in **cytoplasm**.
4. The source of O_2 liberated in photosynthesis is **water**.
5. **Mitochondria** is ATP factory of the cells.
6. The vascular bundles in cucurbita are described as **bicollateral**.
7. Closed vascular bundle refers to absence of **cambium**.
8. **Endodermis** is the innermost layer of cortex.
9. The band like thickenings found in endodermis of dicot root are called **casparian strips**.
10. All tissues inner to endodermis constitute **stele**.
11. Stele includes pericycle and **vascular bundle**.
12. The tissue found between xylem and phloem in a root is called **conjunctive tissue**.
13. **Stomata** is absent in the epiblema of a root.
14. Casparian strips are made of **suberin**.
15. In monocot root, xylem is exarch and **polyarch**.
16. Cambium is absent in monocots and hence no **secondary growth** is seen.
17. In a dicot leaf, the tissue found between upper and lower epidermis is called **mesophyll.**
18. The **spongy parenchyma** in a dicot leaf help in gaseous exchange.
19. The vascular bundle of dicot leaf is surrounded by a layer of cells called **bundle sheath**.
20. The thin walled and large spidermal cells in epidermis of a monocot leaf are called **bulliform cells**.
21. Colourless plastids are called **leucoplasts**.
22. The matrix of chloroplast is called **stroma**.
23. Stack of thylakoids is called **grana**.
24. **Chlorophyll 'a'** is the primary pigment in photosynthesis.
25. ChlorophyII 'a' and accessory pigments together form **photosystems.**
26. The reaction centre in grana for light reaction is a **chlorophyll 'a'** molecule.
27. Dark reaction is also called **Calvin cycle**.

28. Light reaction is also called **Hill reaction**.
29. ATP stands for **Adenosine Triphosphate**.
30. Dark reaction occurs in **stroma** of chloroplast.
31. Porins in mitochondrial membrane are made of **proteins**.
32. **Mitochondria** is called power house of the cell.
33. Mitochondria were discovered by **Kolliker**.
34. The innder mitochondrial membrane gives rise to finger like projections called **cristae**.
35. The oxysomes are involved in **ATP synthesis**.
36. Oxysome is also known as **F_1Particle.**
37. The **oxysomes** are racket shaped particles found in inner mitochondrial membrane.
38. **Mitochondria** is the main organ of cell respiration.
39. Cellular respiration is a **biochemical** process.
40. Pyruvic acid is a **three** carbon molecule.
41. During **glycolysis** glucose is broken into pyruvic acid.
42. Glycolysis occurs in **cytoplasm** of cell.
43. Krebs cycle occurs in **mitochondrial matrix**.
44. Each molecule of flucose produce **two** molecules of pyruvic acid.
45. **Glycolysis** is the first step in aerobic and anaerobic respiration.
46. TCA cycle is also known as **krebs cycle.**
47. In electron transport chain **oxygen** is the ultimate acceptor of electrons.
48. Tissue system of plants was classified by **Sachs**.
49. **Nehemiah Grew** is known as Father of plant anatomy.
50. The lateral roots originate from **pericycle**.
51. The arrangement of xylem and phloem in roots is described as **radial**.

III. State whether the statements are True or False. Correct the False statement

1. Phloem tissue is involved in the transport of water in plant.
   Ans: False. Phloem tissue is involved in the transport **of'food** in plant.
2. The waxy protective covering of a plant is called as cuticle.
   Ans: True
3. In monocot stern cambium is present in between xylem and phloem.
   Ans: False. In **dicot** stem cambium is present between xylem and phloern.
4. Palisade parenchyma cells occur below upper epidermis in dicot root.
   Ans: False. Palisade parenchyma cells occur below upper epidermis in dicot leaf.
5. Mesophyll contains chlorophyll.
   Ans: True.
6. Anaerobic respiration produces more ATP than aerobic respiration.
   Ans: False. **Aerobic** respiration produces more ATP than **anaerobic** respiration.
7. ATP is not produced during anaerobic respiration.
   Ans: False. **less number of ATP** molecules are produced during anerobicrespiration.
8. Electron transport chain helps to release energy via electrons.
   Ans: True
9. Krebs cycle is not seen in anaerobic respiration.
   Ans: True
10. Biosynthetic phase is carried out in the stroma.
    Ans: True
11. The intake of oxygen and release of CO_2 by plants is called cellular respiration.
    Ans: False. The intake of oxygen and release of CO_2 by plants is called **external** respiration.
12. Cristae help to increase surface area of mitochondria.

Ans: True

13. Skull shaped vascular bundles are seen in monocot stem.
    Ans: True
14. Artificial photosynthesis is a method for producing renewable energy by the use of sunlight.
    Ans: True
15. Mitochondria consist of 50% proteins and lipids.
    Ans: False. Mitochondria consist of **80%** proteins and lipids.
16. Glycolysis takes place in the mitochondria.
    Ans: False. Glycolysis takes place in the **cytoplasm**.
17. Krebs cycle is also called as Calvin Cycle.
    Ans: False. Krebs cycle is also called as **Tricarboxylic Acid Cycle**.
18. Calvin cycle cannot be carried out in the absence of light.
    Ans: False. Calvin cycle **can take** place in the absence of light.

IV. Match the following:

A. Match the following

1. Amphicribal	-	a) Dracaena
2. Cambiurn	-	b) Translocation of food
3. Amphivasal	-	c) Fern
4. Xylem	-	d) Secondary growth
5. Phloem	-	e) Conduction of water

Ans: 1-c; 2-d; 3-a; 4-e; 5-b

B. Match the following

1. Artificial photosynthesis	-	a) Melvin Calvin
2. Biosynthetic phase	-	b) C.N.R.Rao
3. Father of plant anatomy	-	c) Sachs
4. Tissue system	-	d) Nehemiah Grew

Ans: a) 1 2 3 4 **b) 2 1 4 3** c) 3 2 1 4 d) 4 1 2 3

C. Match the following

1. F_1 particles	-	a) Calvin
2. Dark reaction	-	b) Light reaction
3. Grana	-	c) Cristae
4. Photosystems	-	d) Chlorophylls

Ans: 1-c; 2-a; 3-b; 4-d

D. Match the following

1. Cambium	-	a) Casparian strips
2. Sclerenchyma	-	b) Endodermis
3. Starch grains	-	c) mechanical strength
4. Endodermis	-	d) Open vascular

Ans: 1-d; 2-c; 3-b; 4-a

E. Match the following

Match the Columns I, II and III correctly:

Column I	Column II	Column III
1) Dermal Tissue	a) Parenchyma tissue	A) Transport of water and minirals
2) Ground Tissue system	b) Epidermis	B) Food storage
3) Vascular Tissue System	c) Outer wall of epidermis	C) Prevention of water loss
4) Cuticle	d) Xylem tissue	D) Evaporation of water

Ans: 1-b-C; 2-a-B; 3-d-A; 4-c-D

V. Assertion and Reason.

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is true but Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Young root contains pith whereas in old root pith is absent.
   Reason: Pith is soft and spongy. Yong root contains pith but as the tree matures its pith transforms into other cells.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
2. Assertion: Cristae increase the inner surface area of mitochondria.
   Reason: Cristae involve in ATP synthesis.
   Ans: c) Assertion is true but Reason is false.
3. Assertion: Pholem conducts food materials to different parts of the plant.
   Reason: Xylem conducts water and minerals to different parts of the plant.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
4. Assertion: Conjunctive tissue is made up of parenchyma in dicot roots.
   Reason: Conjunctive tissue is made up of eclerenchyma in monocot roots. Chlorophyll 'a' is called as
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
5. Assertion: Chlorophyll 'a' is called as reaction centre.
   Reason: ChlorophyII 'a' is the pigment that traps solar energy and converis it into chemical energy.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
6. Assertion: Oxidative phosphorylation requires oxygen.
   Reason: Oxidative phosphorylation occurs in chloroplast.
   Ans: c) Assertion is true but Reason is false.

VI. Analogy type question. Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Internal factors: Pigments :: External factors : **Light**.
2. ChlorophyII 'a' : primary pigment :: ChlorophyII 'b' : **Accessory pigments**.
3. Anaerobic respiration : Without oxygen :: Aerobic respiration: **with oxygen**.
4. Glycolysis : Cytoplasm :: Kreb's cycle : **Mitochondrial membrane**.
5. Light dependent photosynthesis : Robin Hill :: Light independent reactions: **Melvin Calvin**

VII. Answer in a word:

1. A process common to aerobic and anaerobic respiration.
   Ans: Glycolsis.
2. Energy currency of cell.
   Ans:ATP
3. Power house of the cell.
   Ans: Mitochondria membrane.
4. Primary pigment.
   Ans: ChlorophyII 'a'
5. Another name for dark reaction.
   Ans: Calvin cycle.
6. Matrix of chloroplast.

Ans: Stroma

7. Coloured plastids.
   Ans: Chromoplast.
8. Tissue responsible for seconday growth.
   Ans: Cambium.
9. Arrangemetn of xylem in a root.
   Ans: Exarch.
10. Arrangement of exylem in a stem.
    Ans: Endarch
11. ATP formation occurring during electron transport chain of aerobic respiration.
    Ans: Oxidative phosphorylation.
12. Where are Radial condition and conjoint bundles seen.
    Ans: Root and stem.
13. The other name of epiblema.
    Ans: Rhizodermis.
14. Where do we see radial, exarch and terrarch vawlar bundle.
    Ans: Dicot root.
15. Shape of oxysome.
    Ans: Racquet shaped.
16. Location of oxysomesthe
    Ans: Cristae
17. Which Enzyme is released by yeast during fermentation?
    Ans: Zymase
18. Which is the first product of kreb's cycle?
    Ans: Citric acid
19. The end product of oxidative phosphorylation is.
    Ans: ATP +H_2O
20. Substance presne tin casparian strips.
    Ans: Suberin

13. STRUCTURAL ORGANISATION OF ANIMALS

I. Choose the correct answer:

1. In leech locomotion is performed by
   a) Anterior sucker — b) Posterior sucker
   c) Setae — **d) None of the above**.
2. The segments of leech are known as
   a) Metameres (somites) — b) Proglottids
   c) Strobila — d) all the above
3. Pharyngeal ganglion in leech is a part of
   a) Excretory system — **b) Nervous system**
   c) Reprodcutive system — d) Respiratory system
4. The brain of leech lies above the
   a) mouth — b) buccal cavity
   c) pharynx — d) crop
5. The body of leech has
   a) 23 segments — **b) 33 segments**
   c) 38 segmetns — d) 30 segmetns
6. Mammals are _____animals
   a) Cold blooded — **b) Warm blooded**

c) Poikilothermic d) All the above

7. The animals which give birth to young ones are
   a) Oviparous **b) Viviparous**
   c) Ovoviviparous d) All the above
8. Leeches have _____
   a) heart b) lungs
   c) true blood vessels **d) excretory organs**
9. In leeches there are _____ parts of nephridia.
   a) 18 b) 15 **c) 17** d) 12
10. In leeches sperms are stored in
   a) epididymis b) vas deferens
   c) testis d) ejaculatory duct
11. The ovaries of leech lies in the _____ segment.
   a) 10^{th} **b) 11^{th}** c) 13^{th} d) 15^{th}
12. The number of cranial and spinal nerves in rabbit are _____ respectively.
   a) 11 and 36 **b) 12 and 37** c) 12 and 36 d) 10 and 37
13. The urinogenital cananl of female rabbit is formed by union of _____
   a) urethra and vagina b) urinary bladder and urethra
   c) cowper's gland and urinary bladder **d) urinary bladder and vagina**
14. The _____ glands are modified glands of the skin.
   a) perineal **b) mammary**
   c) gastric d) salivary
15. The opening of pulmonary arch into right ventricle of rabbit is guarded by _____ semilunar valves.
   a) 2 b) 4 **c) 3** d) 1
16. Leech may grow to a length of _____
   a) 35cm b) 45cm c) 25cm d) 20cm
17. dental formula fo rabbit is _____
   a) $\frac{2033}{1023}$ b) $\frac{2003}{1003}$ c) $\frac{2030}{1020}$ d) $\frac{2023}{1220}$
18. The _____ on both sides join to form the genital atrium in leech.
   a) ejaculatory ducts b) epididymis
   c) sperm vesicle d) vas efferens
19. Each kidney is made up of several _____
   a) mascula **b) nephrons**
   c) cortex d) epididymis
20. PNS is formed of _____ pairs of cranial nerves in Rabbit.
   a) 10 **b) 12** c) 14 d) 16
21. Egg cells of Rabbit are released in _____
   a) uterus b) vagina
   c) fallopian tube d) ovary
22. The third Ventricle in brain of rabbit lies in
   a) cerebrum b) cerebellum
   c) diencephalon d) medulla

II. Fill in the blanks:

1. The posterior sucker is formed by the fusion of the **last 7** segments.
2. The existence of two sets of teeth in the life of an animal is called **diphyodont** dentition.
3 thre anterior end of leech has a lobe like structure calle **anterior sucker**.

4. The blood sucking habit of leech is known as **sanguivorous**.
5. **Kidney** separate nitrogenous waste from the blood in rabbit.
6. **37 Pairs** spinal nerves are rpesent in rabbit.
7. Leeches have **sanguivorous** feeding habit.
8. The **clitellum** of leech produces a cocoon.
9. In leech **crop** is the largest portion of the alimentary canal.
10. Each chamber in the digestive system of leech bears backwardly directed **caeca or diverticula**.
11. In leech the walls of the buccal cavity bear **three** jaws.
12. In leech the blood is sucked by **muscular pharynx**.
13. In leeches the coelomic fluid contains **haemoglobin**.
14. All the four channels of circulatory system are connected together in **26th** segment of leech.
15. Leech prevent blood cloting by secreting a protein called **hirudin**.
16. The sub pharyngeal ganglion in leech is formed by fusion of **four** pairs of ganglia.
17. Excretion in leech is brought about by **nephridia**.
18. The egg case of leech is called **cocoon**.
19. The thoracic and abdominal cavity of rabbit is separated by **diaphragm**.
20. In rabbit the restis consists of **seminiferous tubules.**
21. Lungs are covered by a membrane called **pleura**.
22. The mid brain of rabbit comprises of **optic lobes**.
23. Testes of rabbit is located in a sac called **scrotum**
24. Leeches belong to phylum **Annelida**.
25. The scientific name of the Indian cattle leech is **Hirudinaria granulosa**.
26. In leeches each segment beav a number of projections called **receptors**.
27. On the mid dorsal side of 26th segment lies the **anus** in leech.
28. The scientific name of common rabbit is **oryctolagus cuniculus**.
29. The oracic cavity and abdominal cavity is separated by a transverse partition called **diaphragm**.
30. The enlarged anterior part of the Trachea or wind pipe is **Larynx or Voice box.**
31. Opening of the larynx is guarded by **epiglottis**.
32. The two branchs of trachea one entering into each lung is called **bronchi**.

III. Identify whether the statements are True or False. Correct the False statement.

1. An anticoagulant presnt in saliva of leech is called heparin.
   Ans: False. An anticoagulant presnt in saliva of leech is called **hirudin**..
2. The vas deferens serves to transport the ovum.
   Ans: False. The vas deferens serves to transport the **sperm**.
3. The rabbit has a third eyelid called tympanic membrane which is movable.
   Ans: False. The rabbit has a third eyelid called **nictitating** membrane which is movable.
4. Diastema is a gap between premolar and molar teeth in rabbit.
   Ans: False. Diastema is a gap between **incisors and premolar** teeth in rabbit.
5. The cerebral hemispheres of rabbit are connected by band of nerve tissue called corpora quadrigemina.
   Ans: False. The cerebral hemispheres of rabbit are connected by band of nerve tissue called **corpus callosum**.
6. Leech do not have true blood vessels.
   Ans: True.
7. The coelomic fluid of leech lacks haemoglobin.
   Ans: False. The coelomic fluid of leech **has** haemoglobin.
8. Mammals are less developed group of animals in the animal kingdom.
   Ans: False. Mammals are the **highest** group in the animal kingdom and are **advanced** over other groups of animals.

9. Ovary of leech is a coiled ribbon shaped structure.
   Ans: True
10. Internal fertilization occurs in leech.
   Ans: True.
11. Parapodia and setae are the locomotory organs of leech.
   Ans: False. Parapodia and setae are **compeletely absent** in leech.
12. Heart of rabit is three chambered.
   Ans: False. Heart of rabit is **four** chambered
13. Cowper's gland and perineal gland are seen in male and female rabbits.
   Ans: True.
14. The uterus of a rabbit is divided into two.
   Ans: True

IV. Match the Columns I, II and III correctly:

A. Match the following

Organs	Membranous covering	Location
1) Brain	a) Pleura	A) Abdominal cavity
2) Kidney	b) Capsule	B) mediastinum
3) Heart	c) Meninges	C) enclosed in thoracic cavity
4) Lungs	d) Pericardium	D) Cranial cavity

Ans: 1-c-D; 2-b-A; 3-d-B; 4-a-C

B. Match the following

A) Hirudin - 1) Papillae
B) Triradiate - 2) Diverticula
C) Caeca - 3) Y shaped incision
D) Jaws - 4) Protein

	A	B	C	D
a)	1	2	3	4
b)	2	3	4	1
c)	**4**	**3**	**2**	**1**
d)	3	2	1	4

C. Match the following

A) Digested blood - 1) Gall bladder
B) Pharynx - 2) Haemocoelic fluid
C) Liver - 3) Intestine
D) 4 channels - 4) Pump

Ans: A-3; B-4; C-1; D-2

D. Match the following

A) Epididymis - 1) Egg
B) Fallopian tube - 2) Fore brain
C) Olfactory lobes - 3) Follicles
D) Ovary - 4) Sperm

Ans: A-4; B-1; C-2; D-3

E. Match the Columns I, II and III correctly:

Column I	Column II	Column III
1) Larynx	a) Piamater	A) Spinal Cord

2) Duramater	b) Trachea	B) Accessory glands
3) Cowper's gland	c) Brain	C) Wind pipe
4) CNS	d) Perineal gland	D) Arachnoid membrane

Ans: 1-b-C; 2-a-D; 3-d-B; 4-c-A

V. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is true but Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Rabbit is a herbivorous animal.
   Reason: Canines are absent in rabbit.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion
2. Assertion: Blood is the food of leech.
   Reason: It has a haemocoelic fluid with haemoglobin.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion
3. Assertion: In adult rabbit, the excretory and genital system becomes inter connected.
   Reason: Sexual dimorphism is seen in rabbits.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion
4. Assertion: Skin of leech is kept moist and slimy.
   Reason: It is due to secretion of mucus which also prevents it from drying.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion
5. Assertion: No true blood vessels are seen in leech.
   Reason: The blood vessels are replaced by haemocoelic channels or canals filled with blood like fluid.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion

VI. Analogy type questions. Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Lungs : Pleura :: Heart: **Pericardium**
2. Leech : Nephridia :: Rabbit: **Kidney**
3. Leech: Supra-Pharyngeal :: Ganglia- Rabbit: **Brain**.
4. Outer: Duramater ::Inner: **Piamater**.
5. Cranial nerves: 12 pairs :; Spinal nerves **: 37 pairs..**
6. Forebrian: Prosencephalon :: Midbrain : **Mesencephalon**.

VII. Answer in a word:

1. Class to which rabbits belong.
   Ans: Mammalia.
2. Blood sucking feeding habit.
   Ans: Sanguivorous.
3. Segments of leech.
   Ans: Somites.
4. Temporary structure formed in segments 9-11 of leech.
   Ans: Clitellum.
5. How many segments are involved in formation of anterior sucker in leech?
   Ans: First five segments.
6. Functions of anterior sucker of leech.

Ans: Attachment, locomotion and feeding.

7. Excretory organ of leech.
   Ans: Nephridia.
8. Tissue found below longitudinal muscles in leech.
   Ans: Botryoidal tissue.
9. Number of chambers found in crop of leech?
   Ans: Ten
10. Parts of alimentary canal in leech where blood is stored?
    Ans: Crop an diverticula.
11. Type of mark made in the skin of a person bit by a leech.
    Ans: Triradiate or Y shaped.
12. Circulatory system of leech.
    Ans: Haemocoelic system
13. Pear shaped structure formed by oviducts in leech.
    Ans: Vagina
14. Type of embroyonic development in leech.
    Ans: Direct development.
15. Two sets of teeth produced in the life of a animal.
    Ans: Diphyodont dentition.
16. Teeth of different kinds seen in a animal.
    Ans: Heterodont dentition.
17. Dental formula of rabbit.
    Ans: $\frac{2033}{1022}$
18. Name the type of teeth which is absent in rabbits.
    Ans: Canine.
19. A part of the alimentary canal in rabbit with cellulose digesting bacteria
    Ans: Caecum
20. A structure which prevents food from entering the trachea in rabbits
    Ans: Epiglottis
21. Shape of heart in rabbit.
    Ans: Pear shaped.
22.. Type of kidneys in rabbit.
    Ans: Metanephric.
23. Another name for birth canal
    Ans: Vagina.
24. Urinogenital canal of female rabbit.
    Ans: Vestibule.
25. Toothless gap between incisors and premolars in rabbits.
    Ans: Diastema.
26. List any one of the Characteristic feature of Phylum Annelida
    Ans: Metameric segmentation
27. What are the two groups of kingdom animalia?
    Ans: Invertebrates and Chordates.
28. Which glands produce milk in animals?
    Ans: Mammary glands.
29. Which sucker helps in feeding?
    Ans: Anterior sucker.

30. Which teeth helps to Cut the food materials in Rabbit?
Ans: Incisors.
31. Which teeth helps in grinding of the food materials in Rabbit?
Ans: Molars.

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

I. Choose the correct answer:

1. Active transport involves
   a) movement of molecules from lower to higher concentration.
   b) expenditure of energy
   c) it is an uphill task
   d) all of the above
2. Water which is absorbed by roots is transported to aerial parts of the plant through
   a) cortex b) epidermis
   c) phloem **d) xylem**
3. During transpiration there is loss of
   a) carbondioxide b) oxygen
   c) water d) none of the above
4. Root hairs are
   a) cortical cell b) projection of epidermal cell
   c) unicellular **d) both b &c**
5. Whch of the following process requires energy?
   a) active transport b) diffusion
   c) osmosis d) all of them
6. The wall of huma heart is made of
   a) Endocardium b) Epicardium
   c) Myocardium **d) All of the above**
7. Whch is the sequence of correct blood flow
   a) ventricle –atrium –vein –arteries
   b) atrium – ventricle – veins – arteries
   c) atrium – ventricle – arteries – vein
   d) ventricles - vein – atrium – arteries
8. A patient with blood group O was injured in an accident and has lost blood. Which blood group the doctor should effectively use for transfusion in this condition?
   a) O group b) AB group
   c) A or B group d) all blood group
9. 'Heart of heart' is called
   a) SA node b) AV node
   c) Purkinje fibres d) Bundle of his
10. Which one of the following regarding blood composition is correct.
    a) Plasma – Blood + Lymphocyte b) Serum – Blood + Fibrinogen
    c) Lymph – Plasma + RBC + WBC **d) Blood – Plasma + RBC + WBC+ Platelets**
11. Persons with _____ blood group can receive blood from 'AB' group individuals.
    a) A only b) B only
    c) AB and O **d) A,B, AB and O**
12. The number of _____ incrases during allergy.
    a) Basophil b) RBC

c) Eosinophil d) Monocyte

13. The ____ are also called polymorpho nuclear leucocytes.
    a) eosinophil b) thrombocyte
    c) neutrophil d) lymphocyte
14. The _____ are the largest of leucocytes.
    a) neutrophil **b) monocyte**
    c) basophil d) lymphocyte
15. The life span of platelets is _____
    a) 3 weeks b) 1 month
    c) 2-3 days d) 40 days
16. _____ is not a feature of veins.
    a) Red in colour b) Non-elastic walls
    c) Lack internal valves d) Blood flow with low pressure
17. Angiology is the study of _____
    a) heart b) heartattack
    c) blood vessels d) diseases of blood
18. Two chambered heart is seen in _____
    a) fish b) amphibian
    c) reptiles d) mammals
19. _____ is not a feature of osmosis.
    a) semi permeable membrane b) movement of solvent
    c) both a&b **d) involves energy**
20. Absorption of water by modern frames of windows in rainy season is an example of _____
    a) diffusion b) osmosis
    c) imbibitions d) transpiration
21. Salt added to pickles brings about _____
    a) diffusion **b) plasmolysis**
    c) imbibitions d) translocation
22. Transpiration does not _____
    a) help in ascent of sap b) help in keeping cells turgid
    c) help in cooling leaves **d) helps in translocation**
23. Identify the wrong statement.
    a) Guttation occurs through stomata.
    b) Water molecules stick to xylem because of adhesion.
    c) Stoma closes when gurad cells are not turgid.
    d) Elements like calcium are not remobilized.
24. By active transport _____ moves into the cells where it is utilized or stored.
    a) glucose **b) sucrose**
    c) fructose d) water
25. Water from soil enters the root haris due to _____
    a) capillary action b) cohesion
    c) adhesion **d) osmosis**
26. _____ is the main circulatory medium in the human body.
    a) blood b) water
    c) lymph d) plasma
27. Plasma is slightly alkaline, containing non-cellular substances which constitutes about _____ of the blood.
    a) 55% b) 44% c) 35% d) 50%

28. Life span of RBC is about _____
    a) 100 days b) 200 days
    c) 150 days **d) 120 days**
29. The other name of red blood corpuscles is _____
    a) erythrocytes b) leucocytes
    c) granulocytes d) agranulocytes
30. Normal pulse rate ranges from _____
    a) 80-90/min **b) 70-90/min**
    c) 50-60/min d) 70-80/min

II. Fill in the Blanks:

1. **Transpiration** involves evaporative loss of water from aerial parts.
2. Water enters the root cell through a **root hair** plasma membrane.
3. Structures in roots that help to absorb water are **root hairs**.
4. Normal blood pressure is $\frac{120}{80}$ **mm Hg.**
5. The normal human heartbeat rate is about **72** time per minute.
6. A mature RBC lacks a **nucleus**.
7. 60-65% of total leucocytes consist of **neutrophils**.
8. The **lymphocytes** among the leucocytes produce antibodies during infection.
9. Among the WBC, **Basophils** release chemicals during the process of inflammation.
10. The body cavity filled with blood is called **haemocoel**.
11. Closed circulatory system was discovered by **William Harvey**.
12. **William Harvey** is regarded as the Father of Modern Physiology.
13. Heart is made up of **cardiac** muscles.
14. Heart is enclosed in a double walled sac called **pericardium.**
15. The atrio ventricular valves are held in position by **chordae tendinae**.
16. Bicuspid valve is also known as **mitral valve**.
17. Similar to mammals, **aves** also have four chambered heart.
18. Human heart is **myogenic** in nature.
19. Blood pressure is measured by an instrument called **sphygmomanometer**.
20. The concept of blood grouping was discovered by **Karl Landsteiner**,
21. The **lymph** supplies nutrition and oxygen to those parts where blood cannot reach.
22. Uphill transport refers to **active transport**.
23 **Diffusion** is a passive process.
24. Root hairs are extension os **epidermis**.
25. In **symplastic** movement water occurs through the sytoplasm of cell.s
26. The **apoplastic** movement of water occurs through intercellular spaces.
27. Stoma is open when guard cells are **turgid**.
28. Stoma remains closed when guard cells are **flaccid**.
29. The process of **transpiration** helps to cool the plant.
30. Elements like **calcium** are not remobilized in the plant.
31. Translocation of food is described as **bidirectional** movement.
32. Plants prepare food in the form of **glucose**.
33. In translocation, food moves in the form of **sucrose**.
34. Guttation occurs through **hydathodes**.

III. Match the following:

A. Match the following

1. Symplastic pathway - a) Leaf

2. Transpiration - b) Plasmodesmata
3. Osmosis - c) Pressure in xylem
4. Root pressure - d) Pressure gradient

Ans: 1-b; 2-a; 3-d; 4-c

B. Match the following

1. Leukemia - a) Thrombocytes
2. Platelets - b) Phagocyte
3. Monocytes - c) Decrease in leucocytes
4. Leucopenia - d) Blood cancer
5. AB blood group - e) Allergic condition
6. O blood group - f) Inflammation
7. Eosinophil - g) Absence of antigen
8. Neutrophils - h) Absence of antibody

Ans: 1-d ; 2-a ; 3-b ; 4-c ; 5-h ; 6-g ; 7-e ; 8-f

C. Match the following

A) Neutrophils - 1) 2%- 3%
B) Eosinophils - 2) 60%-65%
C) Basophils - 3) 20%-25%
D) Lymphocytes - 4) 0.5% - 1.0%

Ans:	A	`B	C	D
a)	1	2	3	4
b)	2	3	4	1
c)	**2**	**1**	**4**	**3**
d)	4	2	1	3

D. Match the following

A) Contraction - 1) Diastole
B) Relaxation - 2) Systole
C) Sino –atrial node - 3) Neve ganglion
D) Neurogenic Heart - 4) Pacemaker

Ans:	A	B	C	D
a)	1	2	3	4
b)	2	3	4	1
c)	**2**	**1**	**4**	**3**
d)	1	3	2	4

E. Match the following

A) Double walled sac - a) Thick walls
B) Auricle - b) Aorta
C) Right ventricles - c) Pericuardium
D) Oxygenated blood - d) Atria

Ans: A-3; B-4; C-1; D-2

IV. State whether True or False. If False write the correct statement:

1. The phloem is responsible for the iranslocat ion of food.
   Ans: True
2. Plants lose water by the process of transpirafion.
   Ans: True
3. The form of sugar transported through the Phloem is glucose.
   Ans: False. The form of sugar transported through the phloem is **sucrose**.
4. In apoplastic movement the water travels through the cell membrane and enter the cell.

Ans: False. In apoplastic movement the water travels through the **intercellular spaces and walls of the cells**.

5. When guard cells lose water the stoma opens.
   Ans: False. When guard cells **become turgid** the stoma opens
6. Initiation and stimulation of heart beat take place by nerves.
   Ans: False. Initiation and stimulation of heart beat take place by **muscles**..
7. All veins carry deoxygenated blood.
   Ans: False. All viens carry deoxygenated blood **except pulmonary vien which carries oxygenated blood**.
8. WBC defend the body from bacterial and viral infections.
   Ans: True
9. The closure of the mitral and tricuspid valves at the start of the ventricular systole produces the first sound 'LUBB'.
   Ans: True.
10. Persons with blood group 'B' have 'B' antibodies and 'A' antigens.
    Ans: False. Persons with blood group 'B' have 'B' antibodies and **antibody** 'a'.
11. Blood is involved in regulation of pH.
    Ans: True
12. The WBC is destroyed in the bone marrow.
    Ans: False. The WBC is formed in the bone marrow
13. Blood helps to maintain water balnce in the body.
    Ans: True.
14. The veins are superficially located.
    Ans: True.
15. Arteries are collecting vessels.
    Ans: False. Arteries are **distributing** vessels
16. The tricuspid and bicuspid valves open at the same time.
    Ans: True.
17. A neurogenic heart is seen in Annelids and Arthropods.
    Ans: True
18. Larger protein molecules can enter lymph capillaries but not into blood capillaries.
    Ans: True
19. Active transport does not require ATP.
    Ans: False. Active transport requires ATP.
20. Ascet of sap takes place through phloem.
    Ans: False. Ascet of sap takes place through xylem.
21. In guttation water comes out in the form of a liquid from the plant.
    Ans: True.
22. Sucrose movement through phloem is an example of passive transport.
    Ans: False. Sucrose movement through phloem is an example of active transport.
23. Water enters the plant through stomata.
    Ans: False. Water enters the plant through **root haris**.

V. Answer in a Word or Sentence:

1. Name two layered protective covering of human heai
   Ans: Pericardium.
2. What is the shape of RBC in human blood?
   Ans: Biconcave / disc shaped.
3. Why is the colour of the blood red?

Ans: Presence of red blood cells containing haemoglobin,

4. Which kind of cells are found in the lymph?
   Ans: White blood corpuscles.
5. Name the heart valve associated with the major arteries leaving the ventricles.
   Ans: Semilunar valves.
6. Mention the artery which supplies blood to the heart muscle.
   Ans: Coronary artery.
7. Fluid portion of blood.
   Ans: Plasma
8. Decrease in number of erythrocytes.
   Ans: Anaemia.
9. The most abundant cells in the human body.
   Ans: Red blood cells.
10. Cells of leucocytes which bring about detoxification of toxins.
    Ans: Eosinophils.
11. Increase in number of leucocytes.
    Ans: Leucocytosis.
12. Another name for blood cancer.
    Ans: Leukemia.
13. Decrease in number of leucocytes.
    Ans: Leukopenia.
14. Decrease in number of thrombocytes.
    Ans: Thrombopenia.
15. Type of circulation in human body.
    Ans: Closed type.
16. Blood vessel which carries impure blood from heart to the lungs.
    Ans: Pulmonary artery.
17. Artery which arises from left ventricle.
    Ans: Aorta
18. left atrioventricular valve.
    Ans: Bicuspid valve.
19. Right atrioventricular valve.
    Ans: Tricuspid valve.
20. Valves present at the base of the aorta.
    Ans: Semilunar valves.
21. Number of chambers in heart of frog.
    Ans: Three
22. Contraction of the heart.
    Ans: Systole
23. Relaxation of the heart.
    Ans: Diastole
24. Pacemaker of the heart.
    Ans: Sinoatrial node.
25. High blood pressure.
    Ans: Hypertension.
26. Clumping of blood caused due to mismatch of blood groups during transfusion.
    Ans: Agglutination.

VI. Analogy type questions. Identify the first words and their relationship and suggest a sutable word for the fourth blank.

1. Red blood corpuscles : Erythrocytes :: White blood corpuscles : **Leucocytes**.
2. Granulocytes: Eosinophils :: Agranulocytes : **Monocytes**.
3. Right atrioventricular valve : Tricuspid valve :: Left atrioventricular valve : **Bicuspid valve.**
4. Thick and Elastic vessels: Arteries:: Thin and Non-Elastic vessels : **Veins**
5. 'AB' blood group: Universal Recipient :: 'O' blood group: **Universal donor**..

VII. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is true but Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Human heart shows double circulation.
   Reason: In double circulation the oxygenated and deoxygenated, blood are mixed and pass through the heart only once.
   Ans: c) Assertion is true but Reason is false.
2. Assertion: The sound of heart beats, heart valve functions can be detected by a stethoscope.
   Reason: Stethoscopes are high precisioned instruments.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
3. Assertion: In fishes the oxygenated and deoxygenated blood are mixed.
   Reason: The blood passes through the heart only once.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
4. Assertion: Imbibition is a type of diffusion.
   Reason: The dry grapes absorb water and swells up.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion
5. Assertion: Proteins are called as pumps in active transport.
   Reason: They use energy to carry substances across cell membrane.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
6. Assertion: Osmosis is active movement of water.
   Reason: It occurs through a semipermeable membrane.
   Ans: c) Assertion is true but Reason is false.

15. NERVOUS SYSTEM

I. Choose the correct answer:

1. Bipolar neurons are found in
   a) retina of eye b) cerebral cortex
   c) embryo d) respiratory epithelium
2. Site for processing of vision, hearing, memory, speech, intelligence and thought is
   a) kidney b) ear
   c) brain d) lungs
3. In reflex action, the reflex arc is formed by
   a) brain, spinal cord, muscle b) receptor, muscle, spinal cord
   c) mucle, receptor, brain **d) receptor, spinal cord, muscle**
4. Dendrites transmit impulse _____ cell body and axon transmits impulse _____ cell body.
   a) away from, away from **b) towards, away from**

c) towards, towards d) away from, towards

5. The outer most of the three cranial meninges is
   a) arachnoid membrane b) piamater
   c) duramater d) myelin sheath
6. There are _____ pairs of cranial nerves and _____ pairs of spinal nerves.
   a) 12, 31 b) 31. 12 c) 12, 13 d) 12, 21
7. The neurons which carries impulse from the central nervous system to the muscle fibre.
   a) afferent neurons b) association neuron
   c) efferent neuron d) unipolar neuron
8. Which nervous band connects the two cerebral hemispheres of brain?
   a) thalamus b) hypothalamus
   c) corpus callosum d) pons
9. Node of Ranvier is found in
   a) muscles **b) axons**
   c) dendrites d) xyton
10. Vomitting centre is located in
    a) medulla oblongata b) stomach
    c) cerebrum d) hypothalamus
11. Nerve cells do not posses
    a) neurilemma **b) sarcolemma**
    c) axon d) dendrites
12. A person who met with an accident lost control of body temperature, water balance and hunger. Which of the following part of brain is supposed to be damaged?
    a) Medulla oblongata b) cerebrum
    c) pons **d) hypothalamus**
13. The autonomic nervous system is regulated by _____ of brain.
    a) cerebrum b) pons
    c) hypothalamus d) medulla
14. Sneezing, yawning etc are examples of _____
    a) voluntary actions b) involuntary actions
    c) reflex actions d) planned actions
15. The _____ has a role in sleep cycle.
    a) cerebrum b) spinal cord
    c) pons d) hypothalamus
16. Pick the option which is not a characteristic of neuron.
    a) dendrites b) axon
    c) axolemma **d) can divide**
17. The _____ is the second largest par of the brain.
    a) cerebrum b) medulla
    c) cerebellum d) pons
18. _____ is the longest cell of the human body.
    a) neuron b) neuroglia
    c) nerve fibres d) cyton
19. Neuroglia are also called as _____
    a) nerve fibres **b) glial cells**
    c) neuron d) nerve cell
20. Cyton is also called cell body or _____
    a) axon **b) perikaryon**

c) neuroglia d) neuron

21. The cytoplasm has granular body called _____
a) nissl's granules b) nerve fibres
c) glial cells d) nerve cells

22. Neurons do not have the ability to _____
a) multiply **b) divide**
c) regenerate d) receive

23. The plasma membrane of axon is called _____
a) axolemma b) axoplasm
c) myelin sheath d) Schwann cells

24. The axons may be covered by a protextive sheath called _____
a) myelin b) nodes of ranvier
c) Schwann cells d) nissl's granules

25. _____ acts as a insulator.
a) myelin sheath b) synaptic junction
c) nodes of ranvier d) glial cells

26. _____ carry impulses from the sense organ to the central nervous system.
a) unipolar neurons b) efferent neurons
c) motor neurons **d) sensory neurons**

27. Each neuron can transmit _____ nerve impulses per second.
a) 2000 b) 3000 **c) 1000** d) 5000

28. The _____ is the controlling centre of all the body activities.
a) heart **b) brain**
c) kidney d) liver

29. _____ is the innermost, thin delicate membrane richly supplied with blood.
a) Durameter b) myelin sheath
c) Piameter d) Arachnoid membrane

30. _____ is an inflammation of the meninges.
a) meningitis b) myelin sheath
c) piameter d) arachnoid membrane

21. A human brain is formed of _____ main parts.
a) three b) four
c) two d) six

22. _____ is the largest portion forming nearly two-third of the brain.
a) Thalamus **b) Cerebrum**
c) Diencephalon d) Cerebellum

23. _____ acts as a relay centre.
a) Thalamus b) Hypothalamus
c) Cerebrum d) Cerebellum

24. _____ is located between thalamus and hindbrain.
a) forebrain **b) midbrain**
c) cerebral lobes d) hypothalamus

25. The second largest part of the brain formed of two large sized hemispheres.
a) Cerebellum b) Cerebrum
c) Thalamus d) Diencephalon

26. Pons is a bridge of _____
a) neuron **b) nerve fibre**
c) neuroglia d) glial cells

27. _____ carry command from spinal cord to our arm.
    a) motor neurons b) sensory neurons
    c) unipolar neurons d) afferent neurons
28. Peripheral neurons system is formed by the nerves arising from the _____
    a) brain and the spinal cord b) dorsal or afferent root
    c) ventral or efferent root d) spinal nerves

II. Fill in the blanks:

1. **Neuron** is the longest cell in our body.
2. Impulses travesl rapidly in **multipolar** neurons.
3. A change in the environment that causes an animal to react is called **stimulus**.
4. **Dendrite** caries the impulse towards the cell body.
5. The two antagonistic component of autonomic nervous system are **sympathetic nerves and para sympathetic nerves.**
6. A neuron contains all cell organelles except **centrioles**.
7. **Cerebro spinal fluid** maintains the constant pressure inside the cranium.
8. **Sulci and gyri** increase the surface area of cerebrum.
9. The part of human brain which acts as realy center is **thalamus**.
10. The cytoplasm of a neuron has granular bodies called **nissl's granules**.
11. The axon is covered with protective **myelin sheath**.
12. Myeli sheath breaks at intervals called **nodes of Ranvier**.
13. The efferent neurons are also called **motor neurons**.
14. The afferent neurons are called **sensory neurons**.
15. **Association neurons** conducts impulses between sensory and motor neurons.
16. Sensory neurons are called **afferent** neurons.
17. The forebrain is made of cerebrum and **diencephalon**.
18. The innermost membrane of the meninges is **piamater**.
19. The outermost membrane covering the brain is **duramater**.
20. The bridge of nerve fibers which connects lobes of cerebellum is **pons**.
21. The posterior most region of spinal cord tapers to form **filum terminale**.
22. There are **31** pairs of spinal nerves.
23. **Cerebro spinal fluid** supplies nutrients to the brain.
24. The term visceral nervous system refers to **autonomic nervous system**.
25. In a reflex action, involving touchin a hot pan, the muscle acts as a **effector**.
26. The pathway of nervous impulse involved in winking of eye when dust falls is called **reflex arc**.
27. Junction between two neurons is called **synapse**.
28. Acquired reflexes are called **conditioned reflexes**.
29. The spinal cord has a cavity called **central canal.**
30. **Meningitis** is an inflammation of the meninges.
31. Vomiting and salivation is regulated by **medulla oblongata**.
32. **Electroencephal ogram** is an instrument which records electrical impulses of the rbain.
33. Spinal cord lies in the **neural canal** of the vertebral column.

III. State whether True or False. If False write the correct statement:

1. Dendrons are the longest fibres that conduct impulses away from the cell body.
   Ans: False. Dendrons are the longest fibresand they conduct **impulses towards cell body**.
2. Sympathetic nervous system is a part of central nervous system.
   Ans: False. Sympathetic nervous system is a part of **autonomous nervous system**.
3. Hypothalamus is the thermoregulatory centre of human body.
   Ans: True

4. Cerebrum controls the voluntary actions of our body.
   Ans: False. **Cerebellum** controls the voluntary actions of our body.
5. In the central nervous system myelinated fibres from the white matter.
   Ans: True.
6. All the nerves in the body are covered and protected by meninges.
   Ans: False. **The brain and spinal cord** are covered and protected by meninges.
7. Cerebrospinal fluid provides nutrition to brain.
   Ans: True
8. Reflex arc allows the rapid response of the body to a stimulus.
   Ans: True
9. Pons helps in regulating respiration.
   Ans: True
10. The reflex actions are monitored by spinal cord.
    Ans: True
11. The duramater is the closest to the brain.
    Ans: False. The **piamater** is the closest to the brain.
12. Cerebellum co-ordinates involuntary activities.
    Ans: False. Cerebellum co-ordinates **voluntary activities**
13. When we do not wear helmets, injury to the medulla can be fatal.
    Ans: True
14. The central nervous system has cranial and spinal nerves.
    Ans: False. The central nervous system consists of the **brain and spinal cord**.

IV. Match the following:

A. Match the following

1. Nissil'S granules	-	a) Forebrain
2. Hypothalamus	-	b) Peripheral Nervous system
3. Cerebellum	-	c) Cyton
4. Schwann cell	-	d) Hindbrain

Ans: 1-c; 2-a; 3-d; 4-b

B. Match the following

A. Cyton	-	1) Isulator
B. Myeliin Sheath	-	2) Perikaryon
C. Swellings	-	3) Nissl's granules
D. Granular body	-	4) Synaptic knob

Ans:	A	B	C	D
a)	1	2	3	4
b)	**2**	**1**	**4**	**3**
c)	3	1	2	4
d)	2	3	4	1

C. Match the following

A) Simple reflexes	-	1) 31 pairs
B) Acquired reflexes	-	2) Unleasrned responses.
C) Cranial nerves	-	3) Conditioned reflexes
D) Spinal nerves	-	4) 12 pairs

Ans:	A	B	C	D
a)	1	2	3	4
b)	2	4	3	1
c)	**2**	**3**	**4**	**1**

d) 4 2 1 3

D. Match the following

A) Autonomic nervous system	-	1) Cranial nerves
B) Peripheral nervous system	-	2) Spinal nerves
C) Spinal cord	-	3) Brain
D) Central nervous system	-	4) Hypothalamus

Ans: A-4; B-1; C-2; D-3

E. Match the following

A) Voluntary action	-	1) Playing an instrument based on music notes.
B) Basic reflex	-	2) Heart beat
C) Involuntary action	-	3) Running
D) Acquired reflex	-	4) Sneezing

Ans: A-3; B-4; C-2; D-1

V.A. Understand the Assertion statement. Justify the reason given and choose the correct choice.

a) Assertion is correct and reason is wrong.
b) Reason is correct and the Assertion is wrong.
c) Both assertion and reason are correct.
d) Both assertion and reason are wrong.

1. Assertion: Cerebrospinal fluid is present throughout the central nervous system.
   Reason: Cerebrospinal fluid has no such functions.
   Ans: a) Assertion is correct and reason is wrong.
2. Assertion: Corpus callosum is present in space between the duramater and piamater.
   Reason: It serves to maintain the constant intractanial pressure.
   Ans: d) Both assertion and reason are wrong.

B. Assertion and Reason type Questions

a) Both Assertion and reason are true and reason is correct explanation of assertion.
b) Both assertion and reason are true but reason is not correct explanation of assertion
c) Assertion is true but reason is false
d) Both assertion and reason are false

3. Assertion: the ability of the brain is determined by the presence of essential fatty acids.
   Reason: They are obtained from fish, green leafy vegetables, almond etc.
   a) Both assertion and reason are true and reason is correct explanation of assertion.
   b) Both assertion and reason are true but reason is not the correct expalantion of assertion.
   c) Assertion is true but reason is false.
   d) Both assertion and reason are false.
4. Assertion: Meningitis is a disorder of the brain.
   Reason: It leads to psychological disturbances.
   a) Both assertion and reason are true and reason is correct explanation of assertion.
   b) Both assertion and reason are true but reason is not the correct expalantion of assertion.
   c) Assertion is true but reason is false.
   d) Both assertion and reason are false.

VI. Analogy type questions. Identify the first words and their relationship and susgest a suitable word for the fourth blank.

1. Neuroglia: Glial :: Cyton: **Perikaryon**.
2. Bipolar neurons: retina of eye:: Multipolar neurons: **Cortex**.
3. Simple reflexes: Basic reflexes :: Acquired reflexes: **Conditioned reflexes**.
4. Sensory neurons: Sense organ::Motor neurons: **Effector**.

VII. Answer in one word.

1. Structural and functional unit of nervous system.
   Ans: Neuron.
2. Non-exciting supporting cells of the nervous system_____
   Ans: Neuroglia.
3. Site of protein synthesis in a cyton_____
   Ans: Nissl's granules.
4. Junction between two neurons.
   Ans: Synapse.
5. Protective sheath found above myelin sheath.
   Ans: Neurilemma
6. Protective sheath covering the axon.
   Ans: Myelin sheath
7. An example of a neurotransmitter.
   Ans: Acetylcholine.
8. Membranes covering the brain.
   Ans: Meninges.
9. Tissue connecting lobes of cerebrum.
   Ans: Corpus callosum.
10. Four rounded bodies found in mid brain.
    Ans: Corpora quadrigemina.
11. What does the word 'pons' mean.
    Ans: Bridge
12. Posterior part of spinal cord.
    Ans: Filum terminale.
13. Special fluid nourishing the brain.
    Ans: Cerebrospinal fluid.

16. PLANT AND ANIMAL HORMONES

I. Choose the correct answer:

1. Gibberellins cause
   a) Shortening of genetically tall plants **b) Elongation of dwarf plants**
   c) Promotion of rooting d) yellowing of young leaves
2. The hormone which has positive effect on apical dominance is
   a) Cytokinin **b) Auxin**
   c) Gibberellins d) Ethylene
3. Which one of the following hormones is naturally not found in plants.
   a) 2,4-D b) GA3
   c) Gibberellin d) IAA
4. Avene coleoptiles test was conducted by
   a) Darwin b) N-Smit
   c) Paal **d) F.W.Went**
5. To increase the sugar production in sugarcanes they are sprayed with _____
   a) Auxin b) Cytokinin
   c) Gibberellins **d) Ethylene**
6. LH is secreted by
   a) Adrenal gland b) Thyroid gland
   c) Anterior pituitary d) Hypothalamus
7. Identify the exocrine gland

a) Pitutary gland
b) Adrenal gland
c) Salivary gland
d) Thyroid gland

8. Which organ acts as both exocirme gland as well as endocrime gland.
a) Pancreas
b) kidney
c) liver
d) lungs

9. Which one is referred as 'Master gland'?
a) Pineal gland
b) Pituitary gland
c) Thyroid gland
d) Adrenal gland

10. The term Auxin was introduced by _____
a) Went
b) Kogl
c) Charles Darwin
d) Kurosawa

11. Auxins were identified by _____
a) Darwin
b) Kogl
c) Went
d) Funk

12. _____ is essential for Morphogenesis.
a) Auxin and Gibberellin
b) Ethylene
c) Auxin and Cytokinin
d) Cytokinin and Abscissic acid

13. _____ is a powerful inhibitor of lateral bud growth in Tomato.
a) Auxin
b) Cytokinin
c) ABA
d) Ethylene

14. _____ induces bud dormancy towards approach of winter in trees.
a) Auxin
b) Ethylene
c) ABA
d) Cytokinin

15. _____ is a growth inhibitor.
a) Auxin
b) GA
c) Cytokinin
d) Ethylene

16. _____ is not a function of thyroid.
a) BMR
b) Body temperature
c) Carbohydrate metabolism
d) Anti allergic

17. _____ is called stress hormone.
a) Auxin
b) Gibberellin
c) Cytokinin
d) ABA

18. Premature shedding is caused by _____
a) Auxin
b) ethylene
c) ABA
d) Gibberellin

19. _____ is a natural Auxin.
a) Phenyl Acetic Acid
b) Indole 3 Butyric acid
c) α –Naphthealene acetic acid
d) Indole -3-propionic acid

20. _____ is a gaseous plant hormone.
a) auxin
b) ethylene
c) cytokinin
d) abscisic acid

21. _____ promotes the development and enlargement of all tissues of the body.
a) GH
b) TSH
c) GTH
d) ACTH

22. Over secretion of growth hormone leads to _____ in children.
a) Dwarfism
b) Acromegaly
c) Gigantism
d) Dysplasia

23. _____ is also called as Stress hormone.

a) Auxin **b) Abscisic acid**
c) Ethylene d) Cytokinin

24. _____ is found in the chloroplast of plants.
a) Auxin **b) Abscisic acid**
c) Ethylene d) Cytokinin

25. _____ promotes the ripening of fruits.
a) Auxin b) Abscisic acid
c) ethylene d) cytokinin

26. ABA is a powerful inhibitor of lateral bud growth in _____
a) tomato b) apple
c) mango d) banana

27. Gibberellins are efficient than _____ in inducing the formation of seedless fruit.
a) Auxin b) Cytokinin
c) Ethylene d) Abscisic acid

28. _____ helps in the contraction of the smooth muscles of uterus at the time of child birth.
a) oxytocin b) prolactin
c) FSH d) GTH

29. Dwarfism is caused by decreased secretion of _____ in children.
a) GH b) FSH
c) GTH d) ACTH

30. Goitre is caused due to the inadequate supply of _____ in our diet.
a) calcium **b) iodine**
c) magnesium d) iron

31. Thyroid gland requires _____ of iodine everyday for the production of thyroxine.
a) 120 µg b) 110 µg
c) 100 µg d) 150 µg

32. Cytokinin is found abundantly in _____
a) soya **b) coconut**
c) sugarcane d) carrot

33. _____ is known as father of Endocrinology.
a) Thomas Addison b) W.M.Bayliss
c) E.H.Starling d) Frits Warmolt Went

34. _____ is the hormone secreted by Thymus.
a) Thymosin b) Estrogen
c) Testosterone d) Progesterone

35. The mineralocorticoids secreted by Zona glomerulosa is _____
a) aldosterone b) testosterone
c) estrogen d) progesterone

36. The deficiency of insulin causes _____
a) diabetes mellitus b) tetany
c) thyroid dysfunction d) cretinism

37. _____ first crystallized thyroxine hormone.
a) Edward C.Kendal b) George Barger
c) W.M.Bayliss d) E.H.Starling

38. The other name of Antidiuretic hormone is
a) Vasopressin b) oxytoxin
c) prolactin d) growth hormone'

39. _____ helps to convert glucose to glycogen in liver,

a) glucagon b) epinephrine
c) insulin d) aldosterone

40. _____ helps in the breakdown of glycogen to glucose in the liver.
a) ephinephrine b) norepinephrine
c) glucagon d) insulin

41. The _____ secrete glucagon.
a) alpha cells b) beta cells
c) leydig cells d) chromaffin cells

II. Fill in the blanks:

1. **Auxin** causes cell elongation, apical dominance and prevents abscission.
2. **Ethylene** is a gaseous hormone involved in abscission of organs and acceleration of fruit ripening.
3. **Abscissic acid** causes stomach closure.
4. Gibberellins induce stem elongation in **rosette** plants.
5. The hormone which has negative effect on apical dominance is **cytokinin**.
6. Calcium metabolism of the body is controlled by **parathormone**.
7. In the Islets of Langerhans, beta cells secrete **insulin**.
8. The growth and functions of thyroid gland is controlled by **thyroid stimulating hormone**.
9. Decreased secretion of thyroid hormones in the children leads to **cretinism**.
10. the term Auxin means **to grow.**
11. An example of a natural auxin is **IAA (Indole -3-Acetic acid)**
12. Went experimented with **coleoptile** of Avena plants.
13. **Hormones** are called chemical messengers.
14. **Auxin / Gibberellin / Ethylene** is a phytohormone.
15. Auxin prevents the formation of **abscission layer**.
16. Cytokinin was first isolated from **herring fish sperm**.
17. **Zeatin** is the cytokinin got from maize (Zeamays)
18. **Gibberellin** are more efficient than auxins in promotion parthenocarpy.
19. **Thomas Addision** is known as the Father of Endoctinology.
20. Bayliss and starling introduced the term **hormone**.
21. the anterior pituitary is also called **adenohypopohysis**.
22. The posterior pituitary is also called **neurohypophysis**.
23. Excess secretion of growth hormone in adults leads to **acromegaly**.
24. Prolactin is also called **lactogenic hormone**.
25. **Melatonin** is a hormone produced by the pineal gland.
26. **Melatonin** is known as time messenger.
27. **Vasopressin** is also known as ADH.
28. Deficiency of ADH causes **Diabetes insipidus**.
29. rapture of graffian follicle to produce ovum is called **ovulation**.
30. Less secretion of growth hormone leads to **Dwarfism**.
31. the two lobes of the thyroid gland are connected by **isthmus**.
32. The follicles of thyroid gland are filled with **thyroglobulin**.
33. Thyroxine contains an aminoacid called **Tyrosine**.
34. **Thyroxine** maintains BMR of the body.
35. **Thyroxine** is called personality hormone.
36. People living in hilly regions suffer from **simple Goitre** due to iodine deficiency.
37. Lack of skeletal development caused due to thyroid dysfunction is called **cretinism**.
38. Deficiency of thyroid hormones in adults causes **myxoedema**.
39. **Grave's disease** is also called exopthalmic Goitre.

40. Excess secretion of thyroxine leads to **Grave's disease**.
41. The hormone **parathormone** regulates calcium levels in the body.
42. Removal of parathyroids results in **Tetany**.
43. **Pancreas** is a dual gland.
44. Human insulin was first discovered by **Fredrick Banting**.
45. The alpha cells of islets of langerhans produce **glucagon**.
46. Insulin converts glucose to **glycogen**.
47. **Glucagon** hormone increases blood glucose levels.
48. The hormones secreted by adrenal cortex are called **corticosteroids**.
49. **Aldosterone** is a mineralocorticoid.
50. **Cortisol** is called life saving hormone.
51. Adrenalin and noradrenalin are called **emergency** hormones.
52. Thymus is partly and endocrine gland and **lymphoid** gland.
53. The **Thymus** gland controls immunological functions.
54. The Thymus gland produces a hormone called **thymosin**.
55. The gonads also serve as **endocrine** glands.

III. Match the following:

A. Match the following

a) Match column I with Column II and III.

Column I	Column II	Column III
1) Auxin	a) Gibberella fujikuroi	A) Abscisison
2) Ethylene	b) Coconut milk	B) Internodal Elongation
3) Abscisic acid	c) Coleoptile tip	C) Apical dominance
4) Cytokinin	d) Chloroplast	D) Ripening
5) Gibberellins	e) Fruits	E) Cell division

Ans: 1-c-C; 2-e-D; 3-d-A; 4-b-E; 5-a-B

B. Match the following hormones with their deficiency sates:

Hormones		**Disorders**
1) Thyroxine	-	a) Acromegaly
2) Insulin	-	b) Tetany
3) Parathormone	-	c) Simple goitre
4) Growth hormone	-	d) Diabetes insipidus
5) ADH	-	e) Diabetes mellitus

Ans: 1-c; 2-e; 3-b; 4-a; 5-d

C. Match the following

A) Glucocorticoids	-	1) Muscle spasm
B) Epinephrine	-	2) Islets of Langerhans
C) Tetany	-	3) Adrenaline
D) Pancreas	-	4) Anti – inflammatory

Ans:	A	B	C	D
a)	1	2	3	4
b)	**4**	**3**	**1**	**2**
c)	3	2	1	4
d)	2	3	4	1

D. Match the following

A) Alpha cells	-	1) insulin
B) Beta cells	-	2) Glucagon
C) Chromaffin cells	-	3) Testes

D) Leydig cells - 4) Adrenal Medulla

Ans:	A	B	C	D
a)	1	2	3	4
b)	**2**	**1**	**4**	**3**
c)	1	2	4	3
d)	2	3	4	1

E. Match the following

A) Edward C. Kendal - 1) Father of Endocrinology
B) Fredrick Banting - 2) Hormone
C) E. H. Starling - 3) Human insulin
D) Thomas Addison - 4) Crystall.ised thyroxine hormone

Ans:	A	B	C	D
a)	1	2	3	4
b)	2	3	4	1
c)	**4**	**3**	**2**	**1**
d)	2	1	3	4

F. Match the following terms with their respective meanings:

A) Ovary - 1) Marked swelling in the neck.
B) Isthmus - 2) Secrete the female sex hormones.
C) Melatonin - 3) Two lobes are connected by means of a narrow band of tissue.
D) Goitre - 4) Hormone produced by the pineal gland at night.

Ans: A-2; B-3; C-4; D-1

G. Match the following terms with their respective functions:

A) Epinephrine - 1) Regulate carbohydrate, protein and fat metabolism.
B) Glucocorticoids - 2) Promotes the conversion of glycogen to glucose in liver and muscles.
C) Mineralocorticoids - 3) Influences the process of spermato genesis.
D) Testosterone - 4) It helps to absorb sodium ions from the renal tubules.

Ans: A-2; B-1; C-4; D-3

H. Match the following

A) Auxin - 1) Growth inhibitor
B) GA - 2) Bolting
C) ABA - 3) Tissue culture
D) Ethylene - 4) Stress hormone

Ans: A-3; B-2; C-4; D-1

I. Match the following

A) IBA - 1) Synthetic auxin
B) Zeatin - 2) Coleoptile
C) Gibberellic acid - 3) Cell division
D) IAA - 4) Rice

Ans: A-1; B-3; C-4; D-2

J. Match the following

A) Acromegaly - 1) Thyroid
B) Cretinism - 2) Pitutary
C) Tetany - 3) Follicle
D) Ovulation - 4) Parathyroid

Ans: A-2; B-1; C-4; D-3

IV. State whether True or False. If False write the correct statement.

1. A plant hormone concerned with stimulation of cell division and promotion of nutrient mobilization is cytokinin.
   Ans: True.
2. Gibberellins cause parthenocarpy in tomato.
   Ans: True
3. Ethylene retards senescence of elaves, flowers and fruits.
   Ans: False. Ethylene **hastens** senescence of elaves, flowers and fruits.
4. Exopthalmic goiter is due to the over secretion of thyroxine.
   Ans: True
5. Pitutary gland is divided into four lobes.
   Ans: False. Pitutary gland is divided into **three** lobes.
6. Estrogen is secreted by corpus luteum.
   Ans: False. Estrogen is secreted by graffian follicles of the ovary.
7. Auxins induce root formation at high concentrations.
   Ans: False. Auxins induce root formation at **low** concentrations. (or) Auxins inhibit root formation at high concentrations.
8. Ethylene breaks the dormancy in buds.
   Ans: True
9. ABA is a growth promotion hormone.
   Ans: False. ABA is a growth **inhibitor**.
10. Deficiency of thyroid hormones in adults causes Grave's disease.
    Ans: False. Deficiency of thyroid hormones in adults causes **Myxoedema**.
11. Adrenalin promotes conversion of glycogen to glucose in liver.
    Ans: True
12. Glucocorticoids stimulate the formation of glucose from glycogen in the liver.
    Ans: True
13. Progesterone is formed from corpus luteum.
    Ans: True
14. Testosterone is essential for formation of placenta.
    Ans: False. **Progesterone** is essential for formation of placenta.
15. The phenomenon of separation of leaves, flowers and fruits from the plant is known as abscission.
    Ans: True
16. Naphthalene acetic acid is anucleic acid.
    Ans: False. Naphthalene acetic acid is **synthetic Auxin**
17. Leydig cells secrete the female sex hormone called Estrogen.
    Ans: False. Leydig cells secrete the male sex hormone called **Testosterone**..
18. Thymosin is the hormone secreted by thymus.
    Ans: True
19. Testosterone influences the process of spermatogenesis.
    Ans: True
20. Glucocorticoids are the hormones of Adrenal Medulla.
    Ans: False. Glucocorticoids are the hormones of **Adrenal Cortex**.
21. Insulin increases blood glucose levels.
    Ans: False. Insulin decreases the concentration of glucose in blood or glucagon increases blood glucose levels
22. Cortisol is also known as life –saving hormone.
    Ans: True
23. Abscisic acid isa gaseous plant hormone.

Ans: False. **Ethylene** isa gaseous plant hormone

V. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is true but Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Application of cytokinin to marketed vegetables can keep them fresh for several days.
   Reason: Cytokinins delay senescence of leaves and other organs by mobilization of nutrients.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
2. Assertion: Pituitary gland is referred as "master gland".
   Reason: It controls the functioning of other endocrine glands.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
3. Assertion: Diabetes mellitus increases the blood sugar levels.
   Reason: Insulin decreases the blood sugar level.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
4. Assertion: Insulin controls blood glucose levels.
   Reason: A balance between insulin and glucagon will prevent diabetes mellitus.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
5. Assertion: Auxins help in apical dominance.
   Reason: They induce elongation of steams.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
6. Assertion: Cytokinins induce parthenocarpy.
   Reason: They inhibit cell division.
   Ans: d) Both Assertion and Reason are false.
7. Assertion: Epinephrine and Norepinephrine are together called as "Emergency hormones"
   Reason: It is produced during conditions of stress and emotion.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
8. Assertion: GH promotes the development and enlargement of all tissues of the body.
   Reason: Oversecretion of growth hormone leads to Gigantism in children.
   Ans: b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.

VI. Answer in one word or sentence:

1. Which hormone promotes the production of male flowers in Cucurbits?
   Ans: Gibberellin.
2. Write the name fo a Synthetic Auxin.
   Ans: 2,4-D (2,4 Dichlorophenoxy Acetic Acid)
3. Which hormone induces parthenocarpy in tomatoes?
   Ans: Gibberellin.
4. What is the hormone responsible for the secretion of milk in female after child birth?
   Ans: Prolactin.
5. Name the hormones which regulates water and minerals metabolism in man.
   Ans: Aldosterone.
6. Which hormone is secreted during emergency situation in man?

Ans: Adrenalin.

7. Which gland secretes digestive enzymes and hormones?
   Ans: pancreas
8. Name the endocrine glands associated with kidneys.
   Ans: Adrenal gland
9. Other name for plant hormone.
   Ans: Phytohorrnone.
10. Chemical messengers of the body.
    Ans: Hormones
11. A natural Auxin.
    Ans: Indole-3-Acetic acid
12. A synthetic auxin.
    Ans: NAA (α - Naphthalcne acetic acid) or 2,4 D (2,4 Dichloro phenoxy acetic acid)
13. Suppression of lateral bud growth by Auxin.
    Ans: Apical dominance.
14. Production of seedless fruits.
    Ans: Parthenocarpy.
15. Hormone found in coconut milk.
    Ans: Cytokinin.
16. Formation of new organs from callus in tissue culture.
    Ans: Morphogenesis.
17. Delay in process of aging in plants caused by cytokinin.
    Ans: Richmond lang effect.
18. Foolish seedling disease of rice.
    Ans: Bakanae.
19. Sudden elongation of stem brought about by GA.
    Ans: Bolting
20. Stress hormone
    Ans: Abscissic acid
21. Separation of leaves, flowers and fruits from the plant.
    Ans: Abscission.
22. Aging of leaves.
    Ans: Senescence
23. Gaseous plant hormone or fruit ripening hormone.
    Ans: Ethylene.
24. Period of rest undergone by buds before sprouting.
    Ans: Dormancy
25. Ductless glands
    Ans: Endocrine glands
26. Testis and ovary are collectively called.
    Ans: Gonads.
27. Another name for pituitary gland.
    Ans: Hypophysis
28. Master gland
    Ans: Pitutary gland
29. Diseases in which individuals with abnormal increase in height are seen.
    Ans: Gigantism.
30. Rupture of mature graafian follicle.

Ans: Ovulation

31. Lactogenic hormone
    Ans: Prolactin
32. Disease in which there is increase in urine output.
    Ans: Diabetes insipidus.
33. Personality hormone.
    Ans: Thyroxine
34. Mineral nutrient required for production of thyroxine.
    Ans: Iodine
35. Glands located on the thyroid gland.
    Ans: Parathyroid gland.
36. Disease characterized by muscle spasm, sustained contraction of muscles in face, larynx etc.
    Ans: Tetany
37. Endocrine cells of pancreas.
    Ans: Islets of Langerhans.
38. Supra renal glands.
    Ans: Adrenal gland.
39. Life saving hormone.
    Ans: Cortisol.
40. Flight, fright and fight hormone.
    Ans: Adrenalin.
41. Male sex hormone.
    Ans: Testosterone.
42. Female sex hormone
    Ans: Estrogen
43. Gland related to immunity of the body.
    Ans: Thymus gland
44. Endocrine gland fromed from raptured follicle.
    Ans: Corpus luteum.

VII. Analogy type questions. Identify the first words and their relationship and susgest a suitable word for the fourth blank.

1. Insulin : Diabetes mellitus :: Vasopressin :: **Diabetes insipidus**.
2. ACTH:Adrenal cortex :: TSH : **Thyroid gland**.
3. Cretinism : Thyroid :: Dwarfism : **Pitutary gland**.
4. Natural Auxin: Indole -3-Acetic acid :: Synthetic Auxin: **2.4 Dichlorophenoxy Acetic Acid**.
5. Glucocorticoids: Zona fasciculate :: Mineralocorticoids : **Zona glomerulosa**.
6. Epinephrine: Adrenaline ::Norepinephrine : **Noradrenalin**.
7. Alpha cells: Glucagon:: Beta cells: **Insulin**

17. REPRODUCTION IN PLANTS AND ANIMALS

I. Choose the correct answer.

1. The plant which propagates with the help of its leaves is _____
   a) onion b) neem
   c) ginger **d) bryophyllum**
2. Asexual reproduction takes place through budding in _____
   a) amoeba **b) yeast**
   c) plasmodium d) bacteria

3. Syngamy results in the formation of _____
   a) zoodpores b) conidia
   c) zygote d) chlamydospores
4. The essential parts of a flower are _____
   a) calyx and corolla b) calyx and androecium
   c) corolla and gynoecium **d) androecium and gynoecium**
5. Anemophilous flowers have _____
   a) Sessle stigma b) small smooth stigma
   c) colored flower d**) large feathery stigma**
6. Male gametes in angiosperms are formed by the division of _____
   a) Generative cell b) Vegetative cell
   c) Microspore mother cell d) Microspore
7. What is true of gametes?
   a) they are diploid b) they give rise to gonads
   c) they produce hormones **d) they are fromed from gonads**
8. The single highly coiled tube where sperms are stored, get concentrated and mature is known as
   a) Epididymis b) Vasa efferentia
   c) Vas deferens d) Seminiferous tubules
9. The large elongated cells that provide nutrition to developing sperms are
   a) primary germ cells **b) sertoli cells**
   c) leydig cells d) spermatogonia
10. Estrogen is secreted by
   a) Anterior pituitary b) Primary follicle
   c) Graffian follicle d) Corpus luteum
11. Which one of the following is an IUCD?
   a) Copper-T b) Oral pillis
   c) Diaphragm d) Tubectomy
12. Fragmentation is seen in _____
   a) spirogyra b) bryophyllum
   c) yeast d) hydra
13. Regeneration is seen in _____
   a) plasmodium b) spirogyra
   c) hydra d) amoeba
14. The pollen is produced in _____
   a) filament **b) anther**
   c) ovule d) stigma
15. There are _____ polar nuclei in the embryo sac.
   a) 2 b) 3 c) 4 d) 1
16. Aster fertilization the _____ disintegrates.
   a) ovule b) polar nuclei
   c) antipodals d) endosperm
17. Endometrium is prepared for implantation in _____
   a) follicular phase b) ovulatory phase
   c) luteal phase d) menstrual phase
18. _____ takes place after implantation.
   a) cleavge b) fertilization
   c) gastrulation d) organogenesis
19. _____ from anterior pituitary stimulates milk secretion.

a) oxytocin **b) prolactin**
c) progesterone d) oestrogen

20. Pollination with the help of insects like honey bees, flies are called _____
a) Entomophily b) Anemophily
c) Hydrophily d) Zoophily
21. Approximately _____ of the pollination doen by the insects is carried by honey bees.
a) 70% **b) 80%**
c) 50% d) 60%
22. _____ is a basal aprt of the ovule.
a) chalaza b) micropyle
c) nucellus d) funiculus
23. An out grow arises on the parent body during _____
a) fragmentation b) fission
c) budding d) regeneration
24. Squirrels pollinate flowers of _____
a) Canna b) Gladioli
c) Silk cotton tree d) Hydrilla
25. Each stamen consists of a small bag like structure called _____
a) anther b) filament
c) pollen grain d) germpore
26. The process of spermatogenesis takes palce in the _____
a) sertoli cells **b) seminiferous tubules**
c) leydig cells d) centrioles
27. Normal gestation period of human last for about _____ days
a) 280 b) 380
c) 480 d) 580
28. During pregnancy the uterus expands upto _____ times of its normal size.
a) 500 b) 600
c) 400 d) 200
29. The fertilized egg becomes implanted in about _____ after fertilization.
a) 5-7days b) 5-6days
c) 6-7days d) 5-8days
30. An oocyte is alive for about _____ after it is released from the follicle.
a) 24 hours b) 12 hours
c) 15 hours d) 20 hours
31. _____ has been one of the first country in the world to launch the nation wide family planning programme in 1952.
a) India b) China
c) America d) Africa
32. _____ from the posterior pituitary stimulates the uterine contractions.
a) oxytocin b) insulin
c) estrogen d) prolactin
33. Which is an example of self-pollination?
a) hibiscus b) grasses
c) apples d) rose
34. _____ is a disc shaped structure.
a) uterus **b) placenta**
c) ovary d) sperm

35. Lack of menstruation generally indicates _____
    a) pregnancy b) anemia
    c) amenorrhea d) overweight
36. The uterus prepares itself to receive the fertilized egg every _____
    a) year b) day
    c) week **d) month**
37. Milk production from alveoli of mammary gland is stimulated by
    a) prolactin b) insulin
    c) oxytocin d) estrogen
38. The ejection of milk is stimulated by posterior pituitary hormone called _____
    a) prolactin b) insulin
    c) oxytocin d) estrogen
39. Changes in the ovary and the uterus are incuced by the _____
    a) LH & FSH b) TRH & TSH
    c) MSH & TRH d) GH & PRH
40. Breaking of the filament into many fragments is called _____
    a) fission **b) fragmentation**
    c) budding d) regeeration

II. Fill in the blanks:

1. The embryo sac in a typical dicot at the time of fertilization is **7 celled**.
2. After fertilization the ovary develops into **fruit**.
3. Planaria reproduces asexually by **Regeneration**.
4. Fertilization is **internal** in humans.
5. The implantation of the embryo occurs at about **7^{th} day** of fertilization.
6. **Colostrum** is the first secretion from the mammary gland after child birth.
7. Prolactin is a hormone produced by **pituitary gland**.
8. The tuberous roots of **asparagus / sweet potato** are used for vegetative propagation.
9. In Agave the **bulbils** help invegetative propagation.
10. In Rhizopus, Spores are produced inside **sporangium**.
11. The stalk of the stamen is called **filament**.
12. The apertures in exine are called **germpores**.
13. The ovule is attached to the ovary wall by a stalk called **funiculus**.
14. The integuments of the ovule enclose a opening called **micropyle**.
15. The cells at the chalazal end of the embryo sac are called **antipodals**.
16. The cells adjoining the egg are called **synergids**.
17. The embryo sac has **eight** nuclei.
18. Autogamy refers to **self pollination**.
19. Wind pollination is called **anemophily**.
20. Pollination by water is een in **Hydrilla**.
21. Pollination in silk cotton is doen by **squirrels**.
22. Flowers of **canna** are pollinated by sun birds.
23. The **generative** cell of the pollen forms sperms.
24. The integuments of the ovule develop inot **seed coat**.
25. Spermatogenesis occurs in **seminiferous tubules** of testis.
26. The head of the sperm contains the **nucleus**.
27. The energy for the movement of the sperm is provided by the **mitochondria**.
28. The human ovum is free fo **yolk**.
29. The membrane forming surface layer of the ovum is called **vitelline membrane**.

30. The plasma membrane of the ovum is surrounded by **corona radiate**.
31. The proliferative phase of the menstrual cycle is also called **follicular phase**.
32. Emptied graafian follicle develops into **corpus luteum**.
33. Implantation takes place in **endometrium** of uterus.
34. The LH hormone is at a peak during **ovulatory** phase of menstrual cycle.
35. The zygote is a **fertilized** ovum.
36. Cleavage results in formation of **blastula**.
37. The **morula** forms the blastula.
38. the formation of germ layers occurs during **gastrulation**.
39. An oocyte ramians alive for **24** hours.
40. The **placenta** is the association between developing embryp and material tissues.
41. The **Umbilical cord** connects the placenta with the foetus.
42. Pregnancy is called **gestation**.
43. The gestation period of humans lasts for **280** days.
44. Child birth is also called **parturition**.
45. If two eggs are produced by the ovary, it results in the formation of **fraternal twins.**
46. India launched family planning programme in **1952**.
47. the inverted red triangle is a symbol of **family planning**.
48. **AIDS** is a sexually transmitted disease.
49. Use of diaphragm is a **barrier** method of family planning.
50. The surgical method of birth control in males is called **Vasectomy** and in females is called **Tubectomy**
51. In Tamilnadu **UNICEF** has developed affordable incinerators using firewood for sanitary napkin disposal.
52. The outer wall or pollen is called **exine** and inner wall is called **intine**.
53. The first menstruation is alled **menarche**.
54. Bladder infection is called **cystitis**.
55. The 14th day of menstrual cycle is called **ovulatory** phase.
56. The thick outer membrane of the ovum is called **corona radiata**
57. Penicillium reproduces asexually by **conidia**.

III. Match the following:

A. Match the following

1. Fission	-	a) Spirogyra
2. Budding	-	b) Amoeba
3. Fragmentation	-	c) Yeast

Ans: 1-b; 2-c; 3-a

B. Match the following terms with their respective meanings:

a) Parturition	-	1) Duration between pregnancy and birth
b) Gestation	-	2) Attachment of zygote to endometrium
c) Ovulation	-	3) Delivery fo baby from uterus.
d) Implantation	-	4) Release of egg from Graffian follicle.

Ans: a-3; b-1; c-4; d-2

C. Match the following

A) Barrier methods	-	1) Pills
B) Hormonal methods	-	2) Condom
C) Intra –Uterine Devices	-	3) Vasectomy
D) Surgical methods	-	4) Copper-T

Ans: A B C D

a) 2 3 4 1
b) 2 1 4 3
c) 1 2 3 4
d) 4 3 2 1

D. Match the following

A) First fluid - 1) 280 days
B) Non-identical twins - 2) 30 houds
C) Gestation period - 3) Colostrum
D) First cleavage - 4) Fraternal twins

Ans: A B C D
a) 1 2 3 4
b) 3 4 1 2
c) 2 3 4 1
d) 1 4 3 2

E. Match the following

A) Mensttual phase - 1) 15^{th} -28^{th} day
B) Follicular phase - 2) 4-5days
C) Ovulatory phase - 3) 6^{th}, 13^{th} days
D) Luteal phase - 4) 14^{th} day

Ans: A B C D
a) 1 2 3 4
b) 2 3 4 1
c) 1 3 4 2
d) 2 4 3 1

E. Match the following with their respective meanings:

A) Nucellus - 1) Self pollination
B) Autogamy - 2) Provides food to the developing embryo
C) Endosperm - 3) One sperm fuses with the egg.
D) Syngamy - 4) Main part of the ovule.

Ans: A-4; B-1; C-2; D-3

F. Match the following

A) Calyx - 1) Consisting of petals.
B) Corolla - 2) Consisting of sepals
C) Androecium - 3) Consisting of carpels
D) Gynoecium - 4) Consisting of stamens

Ans: A-2; B-1; C-4; D-3

G. Match the Column I with Column II

1) Pollination by wind - a) Hydrophily
2) Pollination by insects - b) Anemophily
3) Pollination by water - c) Entomophily

Ans: 1-b; 2-c; 3-a

H. Match the following

1. Sporangium - a) Micropyle
2. Eight nuclei - b) Fungal hypha
3. Three cells - c) Nucellus

Ans: 1-b; 2-c; 3-a

I. Match the following

1. Cross pollination - a) Gladioli (flowers)

2. Squirrels - b) Silk cotton tree (flower)
3. Sun bird - c) Apples

Ans: 1-c; 2-b; 3-a

J. Match the following

Column I	Column II	Column III
1. Fertilized ovum	a) Enzyme	A) Uterine wall
2. Hyaluroni dase	b) Poly hedral shape	B) Fertilization
3. Leydig cells	c) Disc shape	C) Acrosome
4. Placenta	d) Zygote	D) Testes

Ans: 1-d-B; 2-a-C; 3-b-D; 4-c-B

IV. State whether True or False. if False write the correct statement.

1. Stalk of the ovule is called pediel.
   Ans: False. Stalk of the ovule is called **funicle**.
2. Seeds are the product of asexual reproduction.
   Ans: False. Seeds are the product of **sexual** reproduction
3. Yeast reproduces asexually by means of multiple fission.
   Ans: False. Yeast reproduces asexually by **budding**.
4. The part of the pistil which serves as a receptive structure for the pollen is called as style.
   Ans: False. The part of the **plant** which serves as a receptive structure for the pollen is called **stigma**.
5. Insect pollinated flowers are characterized by dry and smooth pollen.
   Ans: False. **Wind pollinated flowers** are characterized by dry and smooth pollens. (or) Insect pollinated flowers are characterized by **large and spiny pollens**.
6. Sex organs produce gametes which are diploid.
   Ans: False. Sex organs produce gametes which are **haploid**.
7. Menstrual cycle ceases during pregnancy.
   Ans: True
8. Surgical methods of contraception prevent gamete formation.
   Ans: False. Surgical methods of contraception prevent **fertilization**.
9. The increased level of estrogen and progesteroneis responsible for menstruation.
   Ans: False. The **decrease** in level of estrogen and progesteroneis responsible for menstruation.
10. Amoeba reproduces by fragmentation.
    Ans: False. Amoeba reproduces by **fission**.
11. The basal part of the ovule is called Chalaza.
    Ans: True
12. In self pollination, seeds produce weak plants.
    Ans: True
13. Menstrual phase is a proliferative phace.
    Ans: False. Menstrual phase is a **destructive** phace
14. Colostrum contains immune substance.
    Ans: True
15. If fertilization occurs, corpus luteum breaks down.
    Ans: False. If fertilization **does not occur,** corpus luteum breaks down.
16. Asexual reproduction involves only mitotic division.
    Ans: True
17. Embryo sac contains 8 Nuclei.
    Ans: True

V. Answer in a word or sentence:

1. If one pollen grain produces two male gametes, how many pollen grains are needed to dertilize 10 ovules?
   Ans: 10 Pollen grains.
2. In which part of the flower germination of pollen grains takes place?
   Ans: Stigma
3. Name two organisms which reproduce through budding.
   Ans: Yeast and Hydra.
4. Mention the function of endosperm.
   Ans: Endosperm provides food to the developing embryo.
5. Name the hormone responsible for the vigorous contractions of the uterine muscles.
   Ans: Oxytocin.
6. What is the enzyme present in acrosome of sperm?
   Ans: Hyalluronidase.
7. When is World Menstrual Hygiene Day observed?
   Ans: May 28.
8. What is the need for contraception?
   Ans: it is a birth control measure.
9. Name the part of the human female reproductive system where the following occurs.
   a) Fertilization b) Implantation
   Ans: a) Fertilization – Fallopian tube b) Implantation – Uterus.
10. The structure which makes up the plant body of a fungus.
    Ans: Hypha.
11. Type of division seen in generative cell of pollen to form sperms.
    Ans: Mitosis
12. Type of division observed in the formation of baby plant from zygote.
    Ans: Mitosis
13. Example fo plant pollinated by water.
    Ans: Vallisneria / Hydrilla.
14. Part of ovule which becomes the seed coat.
    Ans: Integuments.
15. Division of zygote to form Blastula.
    Ans: Cleavage.
16. Ability of lost body part of an animal to produce the entire organism.
    Ans: Regeneration.
17. Innermost whorl of a flower.
    Ans: Gynoecium.
18. Fusion of sperm & ovum in the ovule.
    Ans: Syngamy.
19. Fusion of sperm with polar nuclei.
    Ans: Triple fusion.
20. Cells which nourish the sperms.
    Ans: Sertoli cells.
21. Formation of sperms.
    Ans: Spermatogenesis.
22. Formation of ovum.
    Ans: Oogenesis.
23. Stage in life of an individual when menstruation ceases.
    Ans: Menopause.

24. Formation of primary germ layers in an embryo.
Ans: Gastrulation.

VI. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as.

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.
c) Assertion is correct bur Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Surgical methods of contraception help to prevent implantation.
Reason: They are barrier methods.
Ans: d) Both Assertion and Reason are false.
2. Assertion: The generative cell of the pollen produces two sperms.
Reason: Only one sperm fertilizes the egg.
Ans: b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion
3. Assertion: Asexual reproduction occurs by spore formation.
Reason: The nucleus divides several times within the sporangium and each mucleus with small amount of cytoplasm develops into a spore.
Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
4. Assertion: Oxytocin from the posterior pituitary stimulates the uterine contractions.
Reason: The ejection of milk is stimulated by posterior pituitary hormone oxytocin.
Ans: b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion
5. Assertion: The two outermost whorls calyx and corolla are called as non essential or accessory whorls.
Reason: They are called as non essential whorls because they do not directly take part in reproduction.
Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

VII. Analogy type questions. Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Menstrual: destructive phase :: Follicular: **Proliferative phase**.
2. Spermatozoa: Spermatogenesis :: Ova : **Oogenesis**.
3. Sweet potato: Root :: Agave: **Bulbils**.
4. Condom: Male :: Female : **Diaphragm**
5. Male: Restes:: Female: **Ovaries**.
6. Grapes: Cross pollination :: Hibiscus: **Self pollination**.

18. HEREDITY

1. According to Mendel alleles have the following character.
a) Pair of genes **b) Responsible for character**
c) Production of gametes d) Recessive factors
2.9:3:3:1 rationis due to
a) segregation b) crossing over
c) independent assortment d) recessiveness
3. The region of the chromosome where the spindle fibres get attached during cell division.
a) Chromomere b) Centrosome
c) Centromere d) Chromonema
4. The centromere is found at the centre of the _____ chromosome.

a) telocentric **b) metacentric**
c) sub-metacentric d) acrocentric

5. The _____ units form the backbone of the DNA.
a) 5 carbon sugar b) phosphate
c) nitrogenous bases **d) sugar phosphate**

6. Okazaki fragments are joined together by _____
a) helicase b) DNA polymerase
c) RNA primer **d) DNA ligase**

7. The number of chromosomes found in human beings are _____
a) 22 pairs of autosomes and 1 pair of allosomes.
b) 22 autosomes and 1 allosome.
c) 46 autosomes.
d) 46 pairs autosomes and 1 pair of allosomes.

8. The loss of one or more chromosome in a ploidy is called _____
a) tetraploidy **b) aneuploidy**
c) euploidy d) polyploidy

9. V shaped chromosomes are called _____
a) metacentric b) acrocentric
c) submetacentric d) telocentric

10. The sex chromosomes in a human cell refer to the _____
a) 22nd pair b) 20th pair
c) 23rd pair d) 21st pair

11. The haploid condition in a human cell refers to _____ chromosomes.
a) 44 **b) 23** c) 46 d) 22

12. L shaped chromosomes are described as _____
a) acrocentric b) metacentric
c) submetacentric d) telocentric

13. _____ is not a nitrogenous base.
a) Adenine b) Thymine
c) Leucine d) Cytosine

14. Choose the correct pair
a) A ≡ T b) G ≡ A c) A ≡ C **d) G ≡ C**

15. Franklin and Wilkin were awarded nobel prize for _____
a) studying DNA replication. b) Studying about RNA
c) X-ray diffraction studies of DNA d) isolating DNA

16. Down's syndrome is a case of _____
a) Euploidy b) Deletion
c) Translocation **d) Aneuploidy**

17. _____ is a gene mutation.
a) Deletion b) Duplication
c) Translocation d) Ploidy

18. The enzyme called _____ bind to the origin of replication site.
a) replicase **b) helicase**
c) Amylase d) Ligase

19. In human, each cell normally consists _____ of chromosomes.
a) 23 pairs b) 22 pairs
c) 20 pairs d) 12 pairs

20. Hydrogen bonds between the nitrogeneous bases make the DNA molecule _____

a) unstable **b) stable**
c) unbalanced d) disturbed

II. Fill in the blanks:

1. The pairs of contrasting character (traits) of mendel are called **alleles**.
2. Physical expression of a fene is called **phenotype**.
3. The thin thread like structures found in the mucleus of each cell are called **chromosomes**.
4. DNA consists of two **polynucleotide** chains.
5. An inheritable change in the amont or the structure of a gene or a chromosome is called **mutation**.
6. The protein part of which molecule is disturbed in sickle cell anemia **haemoglobin**
7. Mendel was a native of **Austria**.
8. A cross involving two traints is called **dihybrid cross**.
9. The laws of heredity were proposed by **Mendel**.
10. The number of chromosomes present in a human cell is **46.**
11. The spindle fibres are attached to the **centromere** of a chromosome.
12. the end of a chromosome is called **telomere**.
13. **Chargaff** stated base pair rule.
14. DNA is a **polynucleotide** chain.
15. The enzyme **helicase** binds to origin of replication site in DNA.
16. The term mutation was coined by **Hugo De Vries**.
17. Plant in which de viries first observed mutation **evening primrose**.
18. Adenine and Guanine are called **purines**.
19. Thymine and cytosine are called **pyrimidines**.
20. There are **10** base pairs in one compelte turn of a DNA molecule.
21. **Purines and pyrimidines** are two types of nitrogenous bases in DNA>

III. Identify whether the statement is True or False. Correct the False statement.

1. A typical Mendelian dihybrid ratio of F_2 generation is 3:1.
   Ans: False. A typical Mendelian dihybrid ratio of F_2 generation is **9:3:3:1**.
2. A recessive factor is altered by the presence of a dominant factor.
   Ans: False. **The expression of a recessive factor** is altered by the presence of a fominant factor.
3. Each gamete has only one allele of a gene.
   Ans: True.
4. Hybrid is an offspring from a cross between genetically different parent.
   Ans: True.
5. Some of the chromosomes have an elongated knob like appendage known as telomere.
   Ans: False. Some of the chromosomes have an elongated knob like appendage known as **satellite**.
6. New nucleotides are added and new complimentary strand of DNA is formed with the help of enzyme DNA polymerase.
   Ans: True
7. Down's syndrome is the genetic condition with 45 chromosomes.
   Ans: False. Down's syndrome is the genetic condition with **47** chromosomes.
8. Deletion is a kind of point mutation.
   Ans: True
9. Tripiod plants and animals produce many offsprings.
   Ans: False. Tripiod plants and animals are **typically sterile**.
10. Tetraploid plants cause loss to the farmer.
    Ans: False. Tetraploid plants are **advantageous** to the farmer.
11. Sperms are heterogametic.
    Ans: True

12. RNA is not a hereditary material.
    Ans: True.
    Exception: In some viruses RNA is the hereditary material.
13. Male and female have equal number of autosomes.
    Ans: True.
14. Rod shaped chromosomes are described as acrocentric.
    Ans: True
15. There are 12 base pairs in a complete turn off DNA.
    Ans: False. There are **10 base** pairs in a complete turn off DNA.
16. Ligase separates the two strands of the DNA.
    Ans: False. **Helicase** separates the two strands of the DNA.

IV. Match the following:

A. Match the following

1. Autosomes	-	a) Trisomy 21
2. Diploid condition	-	b) 9:3:3:1
3. Allosome	-	c) 22 pairs of chromosome
4. Down's syndrome	-	d) 2n
5. Dihybrid ratio	-	e) 23rd pair of chromosome

Ans: 1-c; 2-d; 3-e; 4-a; 5-b

B. Match the following

A) Leading strand	-	1) Basic principles of Heredity.
B) Lagging strand	-	2) Continuous strand.
C) Mendel	-	3) Three dimensional model of DNA.
D) Watson and Crick	-	4) Short segments of DNA.

Ans:	A	B	C	D
a)	1	2	3	4
b)	2	1	3	4
c)	1	2	4	1
d)	**2**	**4**	**1**	**3**

C. Match the following

A) DNA polymerase	-	1) Replication fork
B) Topo isomerase	-	2) Replication site
C) DNA ligase	-	3) DNA fragments
D) Helicase	-	4) New strand

Ans: A-4; B-1; C-3; D-2

D. Match the following

A) 2n-2	-	1) Trisomy 21
B) 4n	-	2) Tetraploidy
C) 45+XX	-	3) Nullisomy
D) 2n – 1	-	d) Monosomy

Ans: A-3; B-2; C-1; D-4

E. Match the columns I, II and III correctly:

Column I	Column II	Column III
1. X and Y chromosomes	a) Francis Crick	A) Chromomeres
2. James Watson	b) Sex chromosomes	B) Three dimensional model

3. Eukaryotic chromosomes	c) Chromonema	C) Allosomes
4. Chromatid	d) Autosomes	D) Hetero Chromosomes

Ans: 1-b-D; 2-a-B; 3-d-C; 4-c-A

V. Answer in a sentence:

1. What is a cross in which inheritance of two pairs of contrasting characters are studied?
   Ans: Dihybrid cross.
2. Mention the conditions when both the alleles are identical.
   Ans: Homozygous condition,
3. A garden pea plant produces axial white flowers. Another of the same species produced terminal violet flowers. Identify the dominant trait.
   Ans: Position of flowers: Axillary position is dominant over terminal position of flowers.
   Colour of flowers: white colour is dominant over violet colour.
4. What is the name given to the segments of DNA, which are responsible for the inheritance of a particular character?
   Ans: genes.
5. Name the bond which binds the nucleotides in a DNA.
   Ans: Hydrogen bonds.
6. The unit responsible for transmission of hereditary characters.
   Ans: Gene.
7. The number of contrasting characters chosen by Mendel for his experiments.
   Ans: 7
8. Dominant trait for pod colour in peas.
   Ans: Green
9. Recessive trait for seed colour in peas.
   Ans: Green.
10. Dominant trait for seed colour in peas.
    Ans: Yellow
11. Phenotypic ration of monohybrid cross.
    Ans: 3:1
12. Genotypic ratio of monohybrid corss.
    Ans: 1:2:1
13. Graphical representation to calculate probability of genotypes in a genetic cross.
    Ans: Punnett square.
14. Ratio obtained in a dihybrid cross.
    Ans: 9:3:3:1
15. Who received the Nobel prize for his work on role of chromosomes in heredity?
    Ans: T.H.Morgan.
16. Who coined the term chromosomes?
    Ans: Waldeyer.
17. What does DNA stand for?
    Ans: Deoxyribo Nucleic Acid.
18. Point of location of a gene on a chromosome.
    Ans: Locus.
19. Point of attachment of chromatids of a chromosome.
    Ans: Centromere.
20. Bead like structures along the length of a chromomema.

Ans: Chromomeres.

21. Another name for secondary constriction of a chromosome.
    Ans: Nucleolar organizer.
22. Knob like appendages present at one end of the chromosome.
    Ans: Satellite.
23. Combination of a sugar, phosphate and nitrogenous base.
    Ans: Nucleoride.
24. Name the process by which DNA makes copies of itself.
    Ans: Replication.
25. Enzyme which separates the double helix during replication.
    Ans: Topoisomerase.
26. Enzyme which helps in lengthening the new DNA strand during replication.
    Ans: Polumerase.
27. Enzyme which joins DNA fragments.
    Ans: DNA ligase.
28. Short segments of DNA formed in the new strand during replication of DNA.
    Ans: Okazaki fragment.
29. Condition involving changes in number of chromosomes present in a cell.
    Ans: Ploidy.
30. Another name for Down's syndrome.
    Ans: Trisomy 21.
31. Chromosomal composition of a human sperm.
    Ans: 22A+X or 22A+Y
32. Chromosomal composition of a human egg.
    Ans: 22A+X
33. Type of bonds found between nitrogenous bases in DNA.
    Ans: Hydrogen bonds.
34. Type of bonds found between nucleotides in DNA.
    Ans: Phosphodiester bonds.

VII. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as.

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.
c) Assertion is correct bur Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Sex of the baby depends on human male.
   Reason: Theya re homogameto.
   Ans: c) Assertion is correct but Reason is false.
2. Assertion: There is an equal proportion of purines and pyrimidines in DNA.
   Reason: Adenine links with Thymine and Guanine links with Cytosine.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
3. Assertion: Law of independent assortment is based on dihybrid cross.
   Reason: The factors of one pair assort independently of the other pair.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
4. Assertion: The enzyme helicase, bind to the origin of replication site.
   Reason: Helicase separates the two strands of the DNA.

Ans: b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.

5. Assertion: DNA is responsible for the transmission of hereditary information.
   Reason: There is transmission of hereditary information from one generation to next generation.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion
6. Assertion: Human females are homogametic.
   Reason: In females, the gametes or the eggs formed are similar in their sex chromosome type.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion

19. ORIGIN AND EVOLUTION OF LIFE

I. Choose the correct answer:

1. Biogenetic law states that _____
   a) Ontogeny and phylogeny go together.
   b) Ontogeny recapitulates phylogeny.
   c) Phylogeny recapitulates ontogeny.
   d) There is no relationship between phylogeny and ontogeny.
2. The 'use and disuse theory' was proposed by _____
   a) Charles Darwin b) Ernst Haecked
   c) Jean Baptiste Lamarck d) Gregor Mendel
3. Paleontologists deal with
   a) Embryological evidence **b) Fossil evidences**
   c) Vestigial organ evidences d) All the above
4. The best way of direct dating fossils of recent origin is by
   a) Radio – carbon method b) Uranium lead method
   c) Potassium – argon method d) Both a and c
5. The term Ethnobotany was coined by
   a) Khorana **b) J.W.Harsbberger**
   c) Ronald Ross d) Hugo de vries
6. Diogenesis was speculated by _____
   a) Haldane **b) Pasteur**
   c) Darwin d) Lamarck
7. The idea of Chemical Evolution of life was developed by _____
   a) Haldane and Oparin b) Pasteur
   c) Libby d) Leonardo da vinci
8. _____ is not an example of vestigial organ.
   a) Coccyx b) Appendix
   c) Thick hair d) Nictitating membrane
9. _____ is called the Father of Palaeontology.
   a) Pasteur b) Birbal sahani
   c) Haeckel **d) Leonardo da vinci**
10. Ancon sheep is an example of _____
    a) vestigial organ **b) discontinuous variation**
    c) acquired character d) natural selection
11. The Father of Paleobotany /Founder of Modern Paleobotany is _____
    a) Leonardo da Vinci **b) Sternberg**
    c) Haldane d) Sahani
12. _____ is the only planet in the Goldlock zone.
    a) Jupiter b) Mars

c) Earth d) Venus

13. Biogenetic law or Recapitulation theory was given by _____
    a) Leonado da vinci **b) Ernst Haeckel**
    c) Oparin d) Haldane
14. The Big Bang theory explains the _____
    a) Origin of Universe b) Origin of sea
    c) Origin of mountain d) Origin of water
15. Paleobotoany is derived from Greek words Paleon that means _____
    a) old b) new
    c) past d) aged
16. _____ or sediments fill the hollow depression and forms a cast.
    a) Rocks b) Sand
    c) Soil **d) Minerals**
17. The process of formation of fossils in the rocks is called _____
    a) calcification b) crystallization
    c) pertrification **d) fossilization**
18. Radioactive Carbon (C^{14}) dating method was discovered by _____
    a) W.F.Libby b) Niels Bohr
    c) Issac. Newton d) William Harvey
19. Minerals like _____ slowly penetrate in and replace the original organic tissue and forms a rock like fossil.
    a) calcium b) sodium
    c) magnesium **d) silica**
20. Most _____ and wood dossils are petrified.
    a) bone b) soils
    c) sands d) rocks
21. Charles Darwin was a great _____
    a) chemist **b) naturalist**
    c) doctor d) physicist
22. The degenerated wing of _____ is an example for organ of disuse.
    a) kiwi b) chicken
    c) duck d) dove

II. Fill in the blanks:

1. The characters developed by the animals during their life time, in response to the environmental changes are called **adaptation**.
2. The degenerated and non-functional organs found in an organism are called **vestigial organs**.
3. The forelimbs of bat and human are examples of **homologous** organs.
4. The theory of natural selection for evolution was proposed by **Charles Darwin.**
5. In human beings **vermiform appendix** is a vestigial organ.
6. **Archaeopteryx** is a fossil bird.
7. **Conical teeth** of Archaeopteryx are like a reptile.
8. **Neck of Giraffe** is an example which supports the use and disuse theory.
9. Charles Darwin published his theory titled **Origin of Species**.
10. The germinal variation is also known as **Heritable** variation.
11. The father of Indian paleobotany is **Birbal Sahani**.
12. Original remains of organisms can be preserved in **amber/ice.**
13. Astrobiology is also known as **Exobiology**.
14. The major concept in astrobiology is **habitable zone**.

15. **Variation** is a raw material for evolution.
16. The mutation theory was proposed by **De Vries**.
17. **Ginko biloba** is a living fossil.
18. Organisms which live in extreme conditions on earth are called **extremophiles**.
19. Charles Darwin went in a voyage in a ship called **H.M.S.Beagle**.
20. **Big Bang theory** explains the Origin of Universe.
21. **Discontinuous variation** are sudden changes which occur in an organism due to mutations.
22. Discontinuous variation form the basis for mutation theory proposed by **De vries**.
23. **Mutation** arises due to erros occurring in DNA.
24. In fossils, a replica of a plant or animal may be preserved in **Sedimentary rocks**.
25. The geological time scale is a system or **chronological dating**.

III. State whether True or False. If False write the correct statement.

1. The use and disuse theory of organ was postulated by Charles Darwin.
   Ans: False. The use and disuse theory of organ was postulated by **Lamarck**.
2. The homologous organs look similar and perform similar functions but they have different origin and development pattern.
   Ans: False. The homologous organs look **dissimilar** and perform **different** functions but they have **similar** origin and development pattern.
3. Birds have evolved from reptiles.
   Ans: True
4. Life originates from pre-existing life according to Oparin.
   Ans: False. Life originated from pre-existing life according to **Louis Pasteur**.
5. Fishes originated from mud is a concept in Abiogenesis.
   Ans: True
6. Favourable variations help the animal to become the fittest.
   Ans: True
7. Variations can occur due to mutation.
   Ans: True.
8. Ethnobotany data can help in herbal medicine.
   Ans: True.
9. Bacteria exist in the Antarctic regions.
   Ans: True
10. Ethnomedicinal data will serve as a useful source of information for the chemists.
    Ans: True
11. Nictitating membrane of man is called as vestigial organ.
    Ans: True
12. Analogous organs look different and perform similar functions but they have different origin.
    Ans: False. Analogous organs look **similar** and perform similar functions but they have different origin.
13. Abiogenesis theory states that life originates from pre existing life.
    Ans: False. Biogenesi**s** theory states that life originates from pre existing life.
14. Palaeonotology deals with the study of fossils.
    Ans: True.
15. Archaeopteryx is the oldest knonw fossil bird.
    Ans: True.
16. Homologous organs look similar but are adapted for different functions.
    Ans: False. Homologous organs look **dissimilar** and adapted for different functions.

IV. Match the following:

A. Match the following

a) Atavism - 1) Caudal vertebrae and vermiform appendix
b) Vestigial organs - 2) A forelimb of a cat and abat's wing.
c) Analogous organs - 3) Rudimentary tail and thick hair on the body.
d) Homologous organs - 4) a wing of a bat and a wing of an insect.
e) Wood park - 5) radiocarbon dating.
f) W.F.Libby - 6) Thiruvakkarai

Ans: a-3; b-1; c-4; d-2; e-6; f-5

A. Match the following

A) Analogous organs - 1) Caudal vertebra
B) Vestigial organs - 2) Bat wing
C) Atavism - 3) Forelimbs of vertebrates
D) Homologous organs - 4) Thick hair on the human body

Ans:	A	B	C	D
a)	1	2	3	4
b)	**2**	**1**	**4**	**3**
c)	4	2	1	3
d)	2	4	3	1

B. Match the following

A) H.M.S Beagle - 1) Lamarck
B) Giraffe - 2) Variations
C) Ancon sheep - 3) Homologous organs
D) Human hand - 4) Origin of species

Ans: A-4; B-1; C-2; D-3

C. Match the following

A) Goldilock Zone - 1) Fossilizaion
B) Amber - 2) Exobiology
C) Tribes - 3) Sahani
D) Paleozoic ferns - 4) Ethnobotany

Ans: A-2; B-1; C-4; D-3

D. Match the Column I, II and III correctly.

Column I	Column II	Column III
1. Archaeopteryx	a) Recapitulation theory	A) Degeneration
2. Biogenetic law	b) Fossil bird	B) Ernst Haeckel
3. Use and disuse theory	c) Oparin	C) Jurassic period
4. Chemical Evolution of life	d) Lamarck	D) Haldane

Ans: 1-b-C; 2-a-B; 3-d-A; 4-c-D

V. Answer in a word or sentence:

1. A human hand, a front leg of a cat, a front flipper of a whale and a bat's wing look dissimilar and adapted for different functions. What is the name given to these organs?
   Ans: Homologous organs.
2. Which organism is considered to be the fossil bird?
   Ans: Archaeopteryx.
3. What is the study of fossils called?
   Ans: Palaeontology.
4. Spontaneous generation of life.

Ans: Abiogenesis.

5. Units of life from outer space (Cosmic origin)
   Ans: Panspermia.
6. Human hand and Bat's wings belong to which type of organs.
   Ans: Homologous organs.
7. Reappearance of ancestral characters in individuals.
   Ans: Atavism.
8. Intogeny recapitulates phylogeny.
   Ans: Biofenetic law / Recapitulation theory.
9. What is the name of Study of fossils?
   Ans: Palaeontology.
10. A connecting link between retiles and birds.
    Ans: Archaeopteryx.
11. Name the book published by Lamarck.
    Ans; Philosophic Zoologique.
12. Write an example of an Acquired character.
    Ans: Degenerated wing of kiwi
13. Name of the ship in which Charles Darwin went on a voyage.
    Ans: H.M.S. Beagle.
14. Islands visited by Chanrles Daarwin.
    Ans: Galapagos.
15. Another name for natural selection.
    Ans: Survival of the fittest.
16. Location of fossil wood aprk.
    Ans: Thiruvakkarai.
17. Branch of science dealing with presence of extra terrestrial life in the Universe.
    Ans: Astrobiology / Exobiology.

VII. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as.

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.
c) Assertion is correct bur Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Ginkgo biloba is a living fossil.
   Reason: Ginkgo biloba has persisted and remain unchanged for the past several million years, while its relatives disappeared.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
2. Assertion: The first form of life could have come from pre-existing non living inorganic molecule.
   Reason: This is the basis of chemical evolution of life.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
3. Assertion: When an organism dies, the hard part of the bodies settle at the bottom of sea floors and are covered by sediments.
   Reason: A replica of the organism is formed.
   Ans: c) Assertion is correct but Reason is false.

VIII. Analogy type questions, Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Somatic variation: Not heritable :: Germinal variation: **Heritable**.

2. Continuous variation: Skin colour of an individual ::Discontinuous variation: **Six or more fingers in Humans**.
3. Intraspecific struggle: Same species :: Interspecific struggle: **Different species**.

20. BREEDING AND BIOTECHNOLOGY

I. Choose the correct answer:

1. Which method of crop improvement can be practiced by a farmer if he is in experienced?
   a) clonal selection **b) mass selection**
   c) pureline selection d) hybridization
2. Pusa Komal is a disease resistant variety of _____
   a) sugarcane b) rice
   c) cow pea d) maze
3. Himgiri developed by hybridization and selction for disease resistance against rust pathogens is a variety of _____
   a) chilli b) maize
   c) sugarcane **d) wheat**
4. The miracle rice which saved millions of lives and celebrated its 50th birthday is _____
   a) IR8 b) IR24
   c) Atomita 2 d) Ponni
5. Which of the following is used to produce products useful to humans by biotechnology techniques?
   a) enzyme from organism b) live organism
   c) vitamins **d) both a&b**
6. We can cut the DNA with the help of
   a) acissors **b) restriction endonucleases**
   c) knife d) RNA ase
7. rDNA is a
   a) vectior DNA b) circular DNA
   c) recombinant of vector DNA and desired DNA d) satellite DNA
8. DNA finger printing is based on the principle of identifying _____ sequences of DNA>
   a) single stranded b) mutated
   c) polymorphic **d) repetitive**
9. Organisms with modified endogenous gene or a foreign gene are also known as
   a) transgenic organism b) genetically modified
   c) mutated **d) both a&b**
10. In a hexaploid wheat (2m x 6x = 42) the haploid (n) and the basic (x) number of chromosomes respectively are
    a) n=7 and x=21 b) n=21 and x= 21
    c) n=7 and x=7 **d) n=21 and x= 7**
11. Dr. Norman was an _____ agronomist.
    a) American b) Asian
    c) Russian d) British
12. Dr. Norman received the Nobel peace prize in _____
    a) 1960 b) 1980 c) 1956 **d) 1970**
13. The International rice research institute is liocated at _____
    a) New Delhi b) Mexico
    c) Phillipines d) China
14. The rice variety peta was from _____
    a) China b) Mexico

c) Indonesia d) India

15. Dr. M.S.Swaminathan did experiments in _____
    a) rice b) cotton
    c) flax d) linseed
16. Pusa snowball is a disease resistant variety of _____
    a) cowpea **b) cauliflower**
    c) wheat d) rice
17. Pusa sawani is a insect resistant variety of _____
    a) cowpea b) flat bean
    c) lady's finger d) brassica
18. Banana is an example of auto triploid.
    a) coffee **b) banana**
    c) potato d) peanut
19. Blood clotting factors produced by biotechnology helps patients suffering from _____
    a) haemophilia b) homeostasis
    c) cerebral palsy d) CHD
20. In human beings, _____ of the DNA base sequences are the same and this is called as buil genoic DNA.
    a) 99% b) 50% c) 90% d) 70%
21. The human genome has _____ base pairs.
    a) 3 billion b) 3 million
    c) 30 million d) 30 billion
22. DNA finger printing was developed by
    a) Dr. Ian Wilmut **b) Alec Jeffrey**
    c) Lilly d) Dr. Norman
23. _____ is father of Indian Green Revolution.
    a) Dr.M.S. Swaminathan b) Dt. Norman
    c) Alec Jeffrey d) Dr.Ian Wilmut
24. _____ is a hybrid of wheat and rye,
    a) Triticale b) Raphano brassica
    c) Bananas d) Water melons.
25. An organism having more than two sets of chromosomes is called
    a) Diploid b) Haploid
    c) Monoploid **d) Polyploid**

II. Fill in the blanks:

1. Economically important crop plants with superior quality are raised by **plant breeding**.
2. A protein rich wheat variety is **Atlas 66**
3. **Colchicine** is the chemical used for doubling the chromosomes.
4. The scientific process which produces crop plants enrishced with desirable nutrients is called **fortification**.
5. Rice normally grows well in alluvial soil, but **atomita 2** is a rice variety produced by mutation breeding that grows well in saline soil.
6. **Gene therapy** technique made it possible to genetically engineer living organism..
7. restriction endonucleases cut the DNA molecule at specific positons known as **restriction site**.
8. Similar DNA finger printing is obtained for **identical twins**.
9. **Callus** cells are undifferentiated mass of cells.
10. In gene cloning the DNA of interest is integrated in a **vector**.
11. **Dr. Norman E. Borlaug** is the Father of Green revolution.

12. IR-8 is also called **Miracle rice.**
13. Green revolution in India was brought about by **Dr.M.S swaminathan**
14. Kalyan sona is a variety of **wheat**.
15. The allopolyploid Raphano brassica was produced by **G.D.Karpechenko**.
16. TV-29 is a **triploid** variety of tea.
17. **Triticale** is a hybrid of what and rye.
18. **Mustard gas / Nitrous acid** is an example of a chemical mutagen.
19. Sharbati Sonora is a mutant got by using **gamma rays**.
20. **Atomita 2 rice** is a rice variety with saline tolerance and pest resistance.
21. Atomic garden is also known as **Gamma garden**.
22. **Triticale** is the first man made cereal.
23. Karan Swiss is a cross breed of cow got by crossing brown swiss and **sahiwal**.
24. Hissardale is a breed of sheep developed by **inbreeding**.
25. Hybrid vigour is also called **heterosis**.
26. Hybrid DNA got by genetic engineering is called **rDNA / recombinant DNA**
27. The extra chromosomal DNA rpesnet ina bacteria is called **plasmid**.
28. restriction enzyme cleaves the **phosphodiester** bond in DNA.
29. A genetically exact copy of an organism is called **clone**.
30. Dolly was developed by **Ian Wilmut**
31. Plasmud acts as a **vector** in recombinant DNA technology.
32. Golden rice can produce **beta carotene**.
33. **Bt** gene from Bacillus thuringiensis produce a protein that is toxic to insects.
34. For improved wool quality, transgenic sheep are produed by inserting gene for synthesis of **cysteine**.
35. **Stem cells** are undifferentiated mass of cells with great potency.

III. State whether True or False. If False write the correct statement.

1. Raphano Brassica is a man-made tetraploid produced by colchicines treatment.
   Ans: True
2. The process of production an organism with more than two sets of chromosome is called mutation.
   Ans: False. . The process of production an organism with more than two sets of chromosome is called **polyploidy**..
3. A group of plants produced from a single plant through vegetative or asexual reproduction are called a pureline.
   Ans: False. A group of plants produced from a single plant through vegetative or asexual reproduction are called a clone.
4. Iron fortified rice variety determines the protein quality of the cultivated plant.
   Ans: False. Amino acid rich fortified rice variety containing more amino acids determines the protein quality of the cultivated plant.
5. Golden rice is a hybrid.
   Ans: False. Golden rice is a **genetically modified platn.**
6. Bt gene from bacteria can kill insects.
   Ans: False. Bt gene from **bacteria produces** a toxin that can kill insects.
7. In vitro fertilization means the fertilization done inside the body.
   Ans: False. In vitro fertilization means the fertilization taking place **outside he body by artificial** means.
8. DNA fingerprinting technique was developed by Alec Jeffrey.
   Ans: True
9. Molecular scissors refers to DNA ligases.
   Ans: False. Molecular scissors refers to **restriction endonucleases**..

10. IR-8 is a rice variety developed by Indian Agricultureal Research Institute.
    Ans: False. IR-8 is a rice variety developed by **International Rice Research Institute, Philippines**.
11. In India Dr. M.S.Swaminathan introduced Mexican wheat varieties.
    Ans: True
12. Phaseolus mungo is a exotic species introduced from Mexico.
    Ans: False. Phaseolus mungo is a exotic species introduced from **China**..
13. Colchicine is a mutagenic agent.
    Ans: False. Colchicine is a chemical agent used to induce polyploidy,
14. Triticale is got by hybridization.
    Ans: True
15. Sharbati Sonora is a variety of wheat got by gene cloning.
    Ans: False. Sharbati Sonora is a variety of wheat got by **mutation breeding**..
16. Continued inbreeding produces stronger individuals.
    Ans: False. Continued inbreeding **reduces fertility and productivity**.
17. In human beings 1% of DNA sequences differs from on individual to another.
    Ans: True.
18. VNTRs are similar in all human beings.
    Ans: False. VNTRs differs from one individual to another.
19. Transgenic fish with increased growth have been produced to increase commercial valve.
    Ans: True.

IV. Match the following:

A. Match the following

1. Sonalika	-	a) Phaseolus mungo
2. IR 8	-	b) Sugarcane
3. Saccharum	-	c) Semi-dwarf wheat
4. Mung No.1	-	d) Ground nut
5. TMV-2	-	e) Semi-dwarf Rice
6. Insulin	-	f) Bacillus thuringienesis
7. Bt toxin	-	g) Beta carotene
8. Golden rice	-	h) first hormone produced using rDNA technique.

Ans: 1-c; 2-e; 3-b; 4-a; 5-d; 6-h; 7-f; 8-g

B. Match the following

A) Langdon Down	-	1) base pairs
B) Chargaff	-	2) Trisomy
C) Miracle rice	-	3) Sonora – 64
D) Sharbati Sonora	-	4) IR-8

Ans:	A	B	C	D
a)	1	2	3	4
b)	4	3	2	1
c)	**2**	**1**	**4**	**3**
d)	1	3	4	2

C. Match the following

A) Plasmid	-	1) Joining DNA
B) Restriction enzymes	-	2) Recombinant DNA Technology
C) DNA ligases	-	3) Replicaiton
D) Genetic Engineering	-	4) Break DNA

Ans:	A	B	C	D
a)	1	2	3	4

b) 2 3 4 1
c) 2 4 3 1
d) 3 4 1 2

D. Match the following

A) DNA fingerprinting - 1) Human insulin
B) Eli Lilly - 2) Alec Jeffrey
C) Ian Wilmut - 3) Father of Green revolution
D) Dr. Normal - 4) Nuclear transfer

Ans: A-2; B-1; C-4; D-3

E. Match the following

A) X-rays - 1) Paste
B) Colchicine - 2) Mutagen
C) Ligase - 3) Alzheimer's disease
D) Stem cell - 4) Polyploidy

Ans: A-2; B-4; C-1; D-3

F. Match the following

A) Ak-10 - 1) Rice
B) IR-8 - 2) Wheat
C) Triticale - 3) Ground nut
D) Sahiwal - 4) Cow

Ans: A-3; B-1; C-2; D-4

V. Understand the Assertion statement, Justify the Reason given and choose the correct choice.

a) Assertion is correct and reason is wrong.
b) Reason is correct and the assertion is wrong.
c) Both asswertion and reason are correct.
d) Both asswertion and reason are wrong.

1. Assertion: Hybrid is superior than eithr of its parents.
   Reason: Hybrid vigour is lost upon inbreeding.
   Ans: a) Assertion is correct and reason is wrong.
2. Assertion: Colchicine reduces the chromosome number.
   Reason: it promotes the movement of sister chromatids to the opposite poles.
   Ans: d) Both assertion and reason are wrong.
3. Assertion: rDNA is superior over hybridization techniques.
   Reason: Desired genes are inserted without introducing the undesirable genes in target organisms.
   Ans: c) Both assertion and reason are correct.
4. Assertion: The progeny of pureline varieties are similar in genotype and phenotype.
   Reason: They are raised by self fertilization.
   a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
   b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
   c) Assertion is ture but Reason is false.
   d) Both Asswertion and Reason are false.
5. Assertion: Continued outbreeding reduce fertility and productivity.
   Rason: It helps to eliminate useful fenes.
   a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
   b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
   c) Assertion is ture but Reason is false.
   d) Both Assertion and Reason are false.
6. Assertion: Hybridization is the common method of creating genetic variation.

Reason: Triticale is the first man made cereal hybrid.
a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is ture but Reason is false.
d) Both Asswertion and Reason are false.

7. Assertion: The organism which undergoes mutation is called a mutant.
Reason: it is a common method of creating genetic variation which brings about changes in the organism.
a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
c) Assertion is ture but Reason is false.
d) Both Asswertion and Reason are false.

VI. Analogy type questions. Identify the first words and their relationshop and suggest a suitable word for the fourth blank.

1. DNA finger printing: Alec Jeffrey :: Green revolution: **Dr. Norman E. Borlaug.**
2. Protina: Lysine :: Atlas 66: **Protein**.
3. Cauliflower: Black rot:: Cowpea: **Bacterial blight**.
4. Physical mutagens: X-rays :: Chemical mutagens: **Nitrous acid.**
5. Differentiated cells: Heart cells :: Undifferentiated cells: **Stem cells**.

VII. Answer in one word:

1. Science dealing with breeding of animals.
Ans: Animal husbandry.
2. Initiative taken to increase food production through modern agricultureal technique.
Ans: Green revolution.
3. Who is the Father of Green revolution?
Ans: Dr. Norman E.Borlang.
4. Who is the Father of Indian Green revolution?
Ans: Dr. M.S. Swaminathan.
5. Name the Miracle rice variety.
Ans: IR-8
6. Location of International Rice Institute.
Ans: Philipines.
7. Name the Chinese Dwarf Rice Cariety.
Ans: Dee-geo-woo-gen
8. High yielding rice variety from Indonesia.
Ans: Peta.
9. Disease resistant variety of wheat.
Ans: Himgiri
10. Disease resistant variety of cowpea.
Ans: Pusa Komal.
11. Disease resistant variety of cauliflower.
Ans: Pusa snowball.
12. Insect resistant variety of Brassica.
Ans: Pusa Gaurav.
13. Name the scientific process of developting crop plant enriched with nutrients.
Ans: Biofortification.
14. Plants introduced from other places.
Ans: Exotic species.

15. Selection of best plants from a missed population to raise the next generation.
    Ans: Mass selction.
16. Progeny of a single individual obtained by self breeding.
    Ans: Pureline.
17. Group of plants produced from a single plant by vegetative reproduction.
    Ans: Clone.
18. An organism with more than two sets of chromosomes.
    Ans: Polyploid
19. Name some insect pests that affect plants.
    Ans: Leaf hopper, aphids, shoot and fruit bores.
20. Hybrid of wheat and rye.
    Ans: Triticale.
21. Sudden heritable change in the nucleotide sequence of DNA.
    Ans: Nutation.
22. Factors which induce mutation.
    Ans: Mutagen / Mutagenic agents.
23. **Ans** organism which undergoes mutation.
    Ans: Mutant.
24. Crop improvement brought about by induced mutations.
    Ans: Mutation breeding.
25. Process of crossing two or more types of plants.
    Ans: Hybridization.
26. Give an example of allotetrapiod.
    Ans: Raphano brassica
27. Diseases treated by stem cell therapy.
    Ans: Parkinson's disease and Alzheimer's disease.
28. Technique by which mule was produced.
    Ans: Cross breeding
29. Group of animals of common origin within a species.
    Ans: Breed.
30. Mating of closely related animals.
    Ans: Inbreeding.
31. Breedig of unrelated animals/
    Ans: Outbreeding.
32. Superiority of hybrid over the parents.
    Ans: Heterosis / Hybrid vigour.
33. Manipulation of genes leads to productivity of new DNA.
    Ans: Recombinant DNA (rDNA)
34. Enzymes called as molecular scissors.
    Ans: Restriction enzymes.
35. Enzyme used to join broken DNA fragments.
    Ans: DNA ligase.
36. Technique used in creating Dolly.
    Ans: Somatic cell nuclear tr**Ans**fer technique.
37. Vector used in rDNA technology.
    Ans: Plasmid.
38. Procee of tr**Ans**fer of rDNA into bacterial host cell.
    Ans: Tr**Ans**formation.

39. Replacement of defective genes by tr**Ans**fer of functional genes.
Ans: Gene Therapy.
40. Mass of undifferentiated cells with variable potency in animals.
Ans: Stem cells.
41. Another name for adult stem cell.
Ans: Somatic stem cells.
42. Technique based on similarity in DNA base pairs and genetic differences among individuals.
Ans: DNA finger printing.
43. What does VNTRs stands for?
Ans: Variable number of Tandem Repeat sequences.
44. Name the plants expressing a modified endogenous gene.
Ans: Transgenic plants.
45. Genetically modified rice which can prevent vitamin A deficiency.
Ans: Golden rice.
46. Type of gene introduced in Tilapia (Tr**Ans**genic fish).
Ans: Growth hormone gene.
47. Scientist who developed Dolly.
Ans: Dr. Ian Wilmut.

21. HEALTH AND DISEASES

I. Choose the correct answer:

1. Tobacco consumption is known to stimulate secretion of adrenaline. The component causing this could be
a) Nicotine b) Tannic acid
c) Curcumin d) leptin
2. World 'No Tobacco Day' is observed on
a) May 31 b) June 6
c) April 22 d) October 2
3. Cancer cells are more easily damaged by radiations than normal cells because they are
a) Different in structure b) non-dividing
c) mutated cells **d) undergoing rapid division**.
4. Which type opf cancer affects lymph nodes and spleen?
a) Carcinoma b) Sarcoma
c) Leukemia **d) Lymphoma**
5. Excessive consumption of alcohol leads to
a) loss of memory **b) cirrhosis of liver**
c) state of hallucination d) suppression of brain function
6. Coronary heart disease is due to
a) streptococci bacteria b) imflammation of pericardium
c) weakening of heart valves **d) Insufficient blood supply to heart muscles.**
7. Cancer of the epityhelial cells is called
a) leukemia b) sarcoma
c) carcinoma d) lipoma
8. Metastasis is associated with
a) malignant tumour b) benign tumour
c) both a/& b d) crown gall tumour
9. Polyphagia is a condition seen in
a) obesity **b) diabetes mellitus**

c) diabetes insipidus d) AIDS

10. Where does alcohol effect immediately after drinking?
    a) eyes b) auditory region
    c) liver **d) central nervous system**
11. _____ is not related to NIDDM.
    a) Insulin administration b) Controlled by medicine
    c) Obese d) Insulin action impaired
12. _____ is a symptiom of CHD.
    a) Glycosuria **b) Ischemia**
    c) Hyperglycemia d) Polyphagia
13. _____ helps reduce blood sugar levels.
    a) sweet potato **b) tomato**
    c) beet root d) cane sugar
14. _____ is not a method of treatment for cancer.
    a) surgery b) immunotherapy
    c) vasectomy d) radiation therapy
15. AIDS affect the _____ system.
    a) circulatory b) nervous
    c) immune d) digestive
16. _____ is not a symption of AIDS.
    a) increase in number of WBC. b) Lack of appetite
    c) weight loss d) swelling of lymph nodes
17. World AIDS day is observed on _____
    a) 1st December b) 15th December
    c) 24th November d) 1st May
18. Obesity is not a risk factor for _____
    a) AIDS b) diabetes
    c) Arthritis d) CHD
19. Excess hunger is called _____
    a) polyphagia b) polydipsia
    c) Polyuria d) glycosuria
20. Sexual abused children show symptoms of _____
    a) frequent urinary infection b) head ache
    c) sore head d) migraine

II. State whether True or False, If False write the correct statement.

1. AIDS is an epidemic disease.
   Ans: True
2. Cancer causing genes are called Oncogenes.
   Ans: True
3. Obesity is characterized by tumour formation.
   Ans: False. **Cancer** is characterized by tumour formation.
4. In leukemia both WBCs and RBCs increase in number.
   Ans: False. In leukemia **WBCs increase** in number.
5. Study of cause of diseas is called efiology.
   Ans: True
6. AIDS is not transmitted by contact with a patient's clothes.
   Ans: True.
7. Type 2 diabeties mellitus results due to insulin deficiency.

Ans: False. Type 2 diabeties mellitus results due to **low activity** by insulin.

8. Carcinogens are cancer causing agents.
   Ans: True
9. Nicotine is a narcotic drug.
   Ans: Ture
10. Cirrhosis is associated with brain disorder.
    Ans: False. Cirrhosis is associated with **liver** disorder.
11. Drug addicts can be counseled and rehabilitated.
    Ans: True.
12. Alcohol consumption causes cirrhosis of brain.
    Ans: False. Alcohol consumption causes cirrhosis of **liver**.
13. Carbon dioxide can bind to haemoglobin and reduce oxygen carrying capacity of blood.
    Ans: False. **Carbon monoxide** can bind to haemoglobin and reduce oxygen carrying capacity of blood.
14. Target cells do not respond to insulin in non insulin dependednt diabetes mellitus.
    Ans: False. Target cells **do respond** to insulin in non insulin dependednt diabetes mellitus.
15. Polydipsia leads to dehydration.
    Ans: False. **Polyuria** leads to dehydration.
16. Normal cells migrate to distant parts of the body.
    Ans: False. Cancerous cells migrate to distant parts of the body.
17. UV rays cause damange to DNA.
    Ans: True
18. LDL or bad cholesterol increases risk of heart disease.
    Ans: True
19. During radiation therapy in cancer, surrounding normal cells are protected.
    Ans: True
20. Persons suffering from AIDS have loss of memory and lack of appetite.
    Ans: True.

III. Expand the following Abbreviations:

1. IDDM - Insulin Dependent Diabetes mellitus.
2. HIV - Human Immuno Deficiency Virus
3. BMI - Body Mass Index
4. AIDS - Acquired Immuno Deficiency Syndrome.
5. CHD - Coronary Heart Disease.
6. NIDDM - Non Insulin Dependent Diabetes mellitus.

IV. Match the following:

A. Match the following

1. Sarcoma	-	a) Stomach cancer
2. Carcinoma	-	b) Excessive thirst
3. Polydipsia	-	c) Excessive hunger
4. Polyphagia	-	d) Lack of blood flow to heart muscle.
5. Myocardial infarction	-	e) Connective tissue cancer

Ans: 1-e; 2- a; 3-b; 4-c; 5-d

B. Match the following

A) Grains, Millets	-	1) Haemoglobin
B) Alcohol	-	2) Glycosuria
C) Carbon monoxide	-	3) Diabetes
D) Fatty substances	-	4) Counselling

E) Excess sugar - 5) CHD

Ans: A-3; B-4; C-1; D-5; E-2

C. Match the following

A) Change in food habits - 1) Obesity
B) Increased thirst - 2) Narcotic
C) Excess calories - 3) AIDS
D) Chronic diarrhea - 4) Abuse
E) Pain killer - 5) Diabetes

Ans: A-4; B-5; C-1; D-3; E-2

V. Fill in the blanks:

1. Cirrhosis is caused in liver due to excessive use of **Alcohol**.
2. A highly poisonous chemical derived from tobacco is **Nicotine**.
3. Blood cancer is called **Leukemia**
4. Less response of a drug to a specific dose with repeated use is called **tolerance**.
5. Insulin resisance is a condition in **Type II** diabetes mellitus.
6. The **Posco** act aims to protect children from sexual offences.
7. The **child helpline** provided a social worker who can help an abused child.
8. The National Commission for protection of Child Rights was set up in **2007**.
9. The psychotrophic drugs are calssified based on their mode of action on the **brain**.
10. **Benzopyrene** present in tobacco smoke causes lung cancer.
11. **Diabetes mellitus** is an example of a metabolic disorder.
12. Desirable level for blood serum cholesterol should be less than **200mg/dl** for Indians.
13. PUFA stands for **polyunsaturated fatty acids.**
14. Non Malignant tumours are also called **benign tumour**.
15. HIV belongs to a group of viruses called **retroviruses**.
16. World Cancer Day is observed on **4th February.**
17. Intake of flax seeds can help reduce blood **sugar** levels.
18. Nicotine is a **alkaloid**.
19. **Benzopyrene** is a carcinogenic agent present in tobacco.
20. Anti Tobacoo Act was passed on **15th May**.
21. Non Malignant tumours are also known as **benign**.
22. Cancerous tumours are described as **malignant**.
23. **ELISA/Western blot** is a test to confirm presence of HIV.
24. ELISA stands for **Enzyme Linked Immunosorbent Assay.**
25. HIV attacks the **lymphocytes** of the body.
26. NACO stands for **National AIDS Control Organization**.
27. The wood oncos means **tumour**.
28. A new growth or tumour is also known as **Neoplasm**.
29. Death of heart muscle tissue leads to **myocardial infarction**.
30. Deficient blood supply to heart muscles is called **ischemia**.

VI. Analogy type questions. Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Communicable: AIDS :: Non communicable: **Diabetes mellitus**.
2. Chemotherapy: Chemicals:: Radiation therapy: **Radiation**.
3. Hypertension: Hypercholesterolomia :: Glycosuria: **Hyperglycemia**.
4. Type I: Insulin dependent diabetes mellitus:: Type 2: **Non-insulin dependent diabetes mellitus**.
5. Increased urine output: Polyuria :: Increased fluid intake : **Polydipsia**.
6. Chemotherapy: Anticancerous drugs :: Immunotherapy: **Interferous**.

7. HDL: Good cholesterol :: LDL : **Bad Cholesterol**.
8. Juvenile onset: < 20years :: Maturity onset: **>30 years.**

VII. Answer in a sentence or one word:

1. What are psychotropic drugs?
   Ans: i) There are certain drugs called psychotropic drugs which act on the brain and alter the behavior, consciousness, power of thinking nad perception.
   ii) They are referred as mood altering drugs.
2. Prolonged non-medical use of certain drugs by an individual.
   Ans: Drug addiction / Drug abuse.
3. What is the other name of mood altering drugs?
   Ans: Psychotropic drugs.
4. First phase of treatment in drug deaddiction.
   Ans: Detoxification.
5. Internationla day against drug abuse and illicit trafficking.
   Ans: June 26.
6. Which part of tobacco plant yields drugs.
   Ans: Leaves.
7. A gas which binds with haemoglobin easily than oxygen.
   Ans: Carbon monoxide.
8. The cells of the pancreas which produce insulin.
   Ans: Beta cells.
9. Condition of elevated blood glucose levels.
   Ans: Hyperglycemia.
10. Hormone produced by pancreas which controls sugar levels.
    Ans: Insulin
11. Excess hunger.
    Ans: Polyphagia.
12. Condition of increased thirst.
    Ans: Polydipsia.
13. Condition of increased urine output.
    Ans: Polyuria.
14. Condition of ecessive glucose excreted in urine.
    Ans: Glycosuria.
15. State in which there is accumulation of excess body fat.
    Ans: Obesity
16. BMI stands for
    Ans: Body Mass Index.
17. Condition of narrowing of blood vessels in coronary heart disease.
    Ans: Atherosclerosis.
18. Type of tumour seen in cancer.
    Ans: Malignant tumour.
19. Study of Cancer.
    Ans: Oncology.
20. Another term for tumour.
    Ans: Neoplasm.
21. Administration of anti cancerous drugs to treat cancer.
    Ans: Chemotherapy.
22. Substances used in Immunotherapy to treat cancer.

Ans: Interferous.

23. Mode of tr**Ans**fer of AIDS from infected mother to her child.
    Ans: Placenta.
24. Condition of fatty liver caused by excessive consumption of alcohol.
    Ans: Cirrhosis.
25. Reduction in gaseous exchange area of the lungs.
    Ans: Emphysema.
26. Cancer causing agents.
    Ans: Carcinogens.
27. Give examples of two food products recommended for diabetic patients.
    Ans: Whole grains, millets (Jowar, Bajra, Ragi) green leafy vegetables.
28. What is Body Mass Index?
    Ans: Body Mass Index (BMI) is an estimate of body fat and health risk.
    BMI= weight (kg) / Height (m) $_2$
29. How are tumours classified?
    Ans: Benign and Malignant tumour.
30. How is the word Cancer derived?
    Ans: Cancer is derived from the latin word meaning 'Crab'.
31. Mention any two types of cancer.
    Ans: Carcinoma and Sarcoma
32. What is immunotherapy in cancer treatment?
    Ans: Biological response modifiers like interferous are used to activate the immune system and help in destroying the tumors.
33. Mention the methods used to treat AIDS patients.
    Ans: Use of Anti-retroviral drugs and immune stimulative therapy, can prolong the life of an infected person.

VIII. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as.

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.
c) Assertion is correct bur Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: AIDS virus has been found in urine of patients affected by AIDS.
   Reason: Persons should be kept isolated from the family.
   Ans: c) Assertion is correct but Reason is false.
2. Assertion: Leukaemia affects children below 15 years of age.
   Reason: It is the most common type of cancer.
   Ans: b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.
3. Assertion: Diet rich in unsaturated fat and obesity are the causes for heart disease.
   Reason: The proteins blocks the blood vessels.
   Ans: d) Both Assertion and Reason are false.
4. Assertion: Diabetes, obesity and cancer are disorder caused due to life style modification.
   Reason: Needs of man and his choice are different in this generation.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

22. ENVIRONMENTAL MANAGEMENT

I. Choose the correct answer:

1. Which of the following is/are a fossil fuel?
   a) i only
   b) i and ii
   c) ii and iii
   d) i, ii and iii
2. What are the steps will you adopt for better waste management?
   a) reduce the amount of waste formed
   b) reuse the waste
   c) recycle the waste
   d) all of the above
3. The gas released from vehicles exhaust are
   i. carbon monoxide
   ii. Sulphur dioxide
   iii. Oxides of nitrogen
   a) i and ii
   b) i and iii
   c) ii and iii
   d) i, ii and iii
4. Soil erosion can be prevented by
   a) deforestation
   b) afforestation
   c) over growing
   d) removel of vegetation
5. A renewable source of energy is
   a) petroleum
   b) coal
   c) nuclear fuel
   d) trees
6. Soil erosion is more where there is
   a) no rainfall
   b) low rainfall
   c) rainfall is high
   d) none of these
7. An inexhaustible resources is
   a) wind power
   b) soil fertility
   c) wild life
   d) all of the above
8. Common energy source in village is
   a) electricity
   b) coal
   c) biogas
   d) wood and animal dung
9. Green house effect refers to
   a) cooling of earth
   b) trapping of UV rays
   c) cultivation of plants
   d) warming of earth
10. A cheap, conventional, commercial and inexhaustible source of energy is
    a) hydropower
    b) solar energy
    c) wind energy
    d) thermal energy
11. Global warming will cause
    a) raise in level of oceans
    b) melting of glaciers
    c) sinking of islands
    d) all of these
12. Which of the following statement is wrong with respect to wind energy
    a) wind energy is a renewable energy
    b) the blades of wind mill are operated with the help of electric motor
    c) Production of wind energy is pollution free
    d) usage of wind energy can reduce the consumption of fossil fuels
13. Choose the non renewable energy resource
    a) Solar energy
    b) water
    c) minerals
    d) wind
14. The Chipko movement originated in _____

a) Uttar Pradesh **b) Uttarakhand**
c) Arunachal Pradesh d) Madya Pradesh

15. Forest conservation Act was passed in _____
a) 1952 b) 1958 c) 1978 **d) 1980**

16. The system of National parks and wild life sanctuaries was established in _____
a) 1954 b) 1980 **c) 1935** d) 1988

17. There are _____ biosphere reserves in India.
a) 5 b) 13 **c) 15** d) 18

18. The first National park to be established in India was _____
a) Nilgiris b) Gir forest
c) Corbett National park d) Kaziranga Sancturay.

19. Wild life preservation society of India is located in _____
a) Delhi b) Uttarakhand
c) Deharadun d) Chattisgarh

20. The project for conservation of _____ was launched in 1976.
a) tiger b) elephant
c) lion **d) crocodile**

21. Choose the word not applicable to fossil fuels.
a) hydrocarbons b) decomposition
c) natural process **d) inexhaustible**

22. India is the _____ largest consumer of crude oil.
a) fourth b) seventh
c) third d) second

23. _____ is not obtained from petroleum.
a) biogas b) diesel
c) gasoline d) LPG

24. Medical waste is disposed by _____
a) sanitary land fill **b) incineration**
c) Composting d) Segregation

25. Water is denser than air and therefore can generate electricity at _____ than wind turbines.
a) lower speeds b) high speeds
c) very low speeds d) very high speeds

26. _____ is called fossil fuels as they are formed from the degradation of biomass buried deep under the earth.
a) petroleum b) kerosence
c) mniral ores d) oil

II. Fill in the blanks:

1. Deforestation leads to **decrease** in rainfall.
2. Removal of soil particles from the land is called **soil erosion**
3. Chipko movement is initiated against **deforestation**
4. **Nilgiris** is a biosphere reserve in Tamilnadu
5. Tidel energy is **renewable** type of energy
6. Coal, Petroleum and natural gas are called **fossil** fuels
7. **Coal** is the most commonly used fuel for the production of electricity
8. The word forest is derived from the Latin word **Foris**.
9. **Shale gas** is got by using the technique called hydraulic fracturing.
10. Extraction of **shale** gas can affect water table.
11. The number of basins that India has identified for shale gas exploration is **six**.

12. Because of **Chipko movement** there was a 15 year ban on cutting trees in the Himalayan region.
13. **Social forestry** seeks the use of public and common land to produce firewood, timber etc for use of rural community.
14. Soil Erosion can be managed by **reforestation / terracing / contour ploughing**.
15. Solar cell is made of **silicon**.
16. The soft finely stratified sedimentary rock is called **shale**.
17. Kallanai Dam is located on the river **Kaveri**.
18. **Forests** act as carbon sinks and produce oxygem.
19. The word Chipko means **embrace**.
20. **Solar** energy is free of cost and available in abundance in our country.
21. **Methane** is the major component of Biogas.
22. Burning of plastics produce **Dioxins**.

III. Match the following:

A. Match the following

1. Soil erosion	-	a) energy saving
2. Bio gas	-	b) acid rain
3. Natural gas	-	c) removel of vegetation
4. Green house gas	-	d) renewable energy
5. CFL bulbs	-	e) CO2
6. Wind	-	f) non-renewable energy
7. Solid waste	-	g) Lead and heavy metals

Ans: 1- c; 2- e; 3 – f; 4- b; 5 – a; 6 – d; 7 - g

B. Match the following

A) Biogas	-	1) Small ponds
B) Coranis	-	2) Natural gas
C) Fossil fuels	-	3) Shale gas
D) Small old rocks	-	4) Gobar Gas

Ans:	A	B	C	D
a)	1	2	3	4
b)	**4**	**1**	**2**	**3**
c)	2	3	4	1
d)	3	4	2	1

C. Match the following

A) Wind mill	-	1) Ocean tides
B) Tidal energy	-	2) Electricity
C) Recharge pits	-	3) Hydropower
D) Water energy	-	4) Ground wells

Ans: A-2; B-1; C-4; D-3

D. Match the Column I, II and III correctly.

Column I	Column II	Column III
1. PVC	a) Nervous system	A) Neural damage
2. Cadmium	b) Dioxin	B) Brain development in child
3. Mercury	c) Kidney	C) Brain
4. Lead	d) Chronic damage	D) reproduction problems

Ans: 1-b-D; 2-c-A; 3-d-C; 4-a-B

IV. State whether the following statement sare True or False. Correct the False statement.

1. Biogas is a fossil fuel
   Ans: True
2. Planting trees increase the ground water level
   Ans: True
3. Habitat destruction cause loss of wild life
   Ans: True
4. Nuclear energy is a renewable energy
   Ans: False. Nuclear energy is a non renewable source of energy
5. Overgrazing prevents soil erosion
   Ans: False. Overgrazing can lead to soil erosion.
6. Poaching of wild animals is a legal act.
   Ans: False. Poaching of wild animals is illegal.
7. National park is a protected park
   Ans: True
8. Wild life protection act was estabilished in 1972.
   Ans: True
9. Biogas is produced by anaerobic decomposition of cow dung.
   Ans: True
10. Plastic waste can be composed.
    Ans: False. Plastic is not **biodegradable** and hence cannot be composted.
11. Run off water will cause soil erosion.
    Ans: True
12. Tidal energy is a conventional renewable source of energy.
    Ans: False. Tidal energy is a **non conventional** renewable source of energy.
13. Using pressure cooker can reduce consumption of fuel.
    Ans: True
14. Solar energy causes pollution.
    Ans: False. Solar energy **does not cause** pollution.
15. Shale gas can affect ground water reserves.
    Ans: True
16. Wind energy is free of cost.
    Ans: False. It involves expensies but espenses on periodic maintenance is low when compared to other sources.
17. In sewage treatments Aeration is a anaerobic method of treatment.
    Ans: False. In sewage treatments Aeration is a **aerobic** method of treatment.

V. Assertion and Reason:

Direction: In each of the following questions a statement of Assertion (A) is given and a corresponding statement of Reason (R) is given just below it. Mark the correct statement as.

a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.
c) Assertion is correct bur Reason is false.
d) Both Assertion and Reason are false.

1. Assertion: Tidal energy does not produce pollution.
   Reason: Water is denser than air and hence electricity generated by tidal energy is at a lower speed than wind turbines.
   Ans: b) Both Assertion and Reason are ture but Reason is not the correct explanation of Assertion.
2. Assertion: Ooranis are traditional methods of collecting Rain water.

Reason: Ooranis are not useful now-a-days.
Ans: c) Assertion is correct but Reason is false.

3. Assertion: Paddy waste can be recycled.
   Reason: it produces Biogas.
   Ans: c) Assertion is correct but Reason is false.
4. Nilgiris is a bioreserve.
   Reason: The flora and fauna must be conserved.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.
5. Assertion: Solar cell produces electricity without polluting the environment.
   Reason: It uses no fuel other than sunlight, no harmfull gases, no burning and no wastes are produced.
   Ans: a) Both Assertion and Reason are true and Reason is correct explanation of Assertion.

VI. Analogy type questions. Identify the first words and their relationship and suggest a suitable word for the fourth blank.

1. Non-renewable : Exhaustible :: Renewable : **In exhaustible.**
2. Chromium : Asthmatic bronchitis :: Cadmium: **Neural damage**.
3. Petrol: Antomobiles:: LPG: **Cooking food**.

VII. Answer in one word:

1. An example of Fossil fuel.
   Ans: Coal / Petroleum.
2. Destruction of large area of forests.
   Ans: Deforestation.
3. Planting of trees in a large scale.
   Ans: Afforestation.
4. Name the non-violent agitation aimed at protection of trees.
   Ans: Chipko movement.
5. An initiative seeking public support for use of public land to prudce fire wood, fodder etc,
   Ans: Social forestry programme.
6. Name a biosphere reserve in Tamilnadu.
   Ans: Nilgiris.
7. Removal of upper layer fo soil by wind, water etc.
   Ans: Soil erosion.
8. A conventional source of energy.
   Ans; Coal.
9. A non conventional source of energy.
   Ans: Solar energy.
10. Another name for petroleum.
    Ans: Crude oil
11. What does LPG stand for
    Ans: Liquefied Petroleum Gas
12. What does CFC stand for.
    Ans: Compact Fluorescent Lamp
13. Name a photovoltaic device
    Ans: Solar cell
14. Small ponds traditiaonlaly used in village for various needs
    Ans: Ooranis
15. What are E-wastes
    Ans: Electronic wastes.
16. Methods of disinfection used in sewage treatment.

Ans: Chlorination

17. Methods used to treat medical waste.
    Ans: Incineration.
18. Method of disposing biodegradable solid waste.
    Ans: Composting.
19. When did the Governmetn of Tamilnadu announce ban on plastic products.
    Ans: 5th June 2018.
20. Name the products for which use of plastic sachets has been legally permitted (Any two).
    Ans: Milk and medicines.
21. A place reserved exclusively for use of animals.
    Ans: Sanctuary.

23. VISUAL COMMUNICATION

I. Choose the correct answer:

1. Which software is used to create animation?
   a) paint b) PDF
   c) MS Word **d) Scratch**
2. All files are stored in the _____
   a) folder b) box
   c) pai d) scanner
3. Which is used to build scripts?
   a) script area b) block palette
   c) stage d) sprite
4. Which is used to edit programs?
   a) inkscape **b) script editor**
   c) stage d) sprite
5. Where you will create category of blocks?
   a) block palette **b) block menu**
   c) script area d) sprite
6. The output of any application is commonly known as _____
   a) file b) folder
   c) disk d) output
7. Multiple files are stored in a _____
   a) script editor b) paint
   c) notepad **d) folder**
8. Which button we used to selct a required program?
   a) program button b) restart button
   c) my computer **d) start button**
9. Notes can be collected, edited and printed using_____
   a) paint b) scratch
   c) notepad d) LINUX
10. Which one is used to draw and edit pictures.
    a) notepad **b) paint**
    c) scratch d) windows OS
11. To create animations, cartoons and games easily we can use _____
    a) paint b) notepad
    c) LINUX **d) scratch**
12. How many parts are there in the scratch editor?

a) 4 b) 2 **c) 3** d) 1

13. In scratch, the characters are known as _____
    a) sprite b) stage
    c) element d) script
14. To choose a block we use _____
    a) script area b) block menu
    c) block palette d) script editor
15. In scratch, the background is referred as _____
    a) stage b) script
    c) block d) sprite
16. Which button is pressed to run the scrpt?
    a) green flag b) red flag
    c) blue flag d) yellow flag
17. Windows and LINUX are exampled of _____
    a) files b) folders
    c) operating systems d) programs
18. The device which helps in explaining the concept easily through pictures is _____
    a) visible communication device b) visible cinema device
    c) visual cinema device **d) visual communication device**

II. Match the following:

A. Match the following

1. Script area	-	a) Type notes
2. Folder	-	b) Animation software
3. Scratch	-	c) Edit programs
4. Costume editor	-	d) Store files
5. Notepad	-	e) Build scripts

Ans: 1-e; 2-d; 3-b; 4-c; 5-a

B. Match the following

a) Stage	-	1) Build scripts
b) Sprite	-	2) Choose category of blocks
c) Script area	-	3) Character
d) Block new	-	4) Background

Ans: a-4; b-3; c-1; d-2

C. Match the following

a) Notepad	-	1) Pictures
b) Paint	-	2) Notes
c) LINUX	-	3) Operating system
d) Cinema	-	4) Visual Communication Device

Ans: a-2; b-1; c-3; d-4

D. Match the following

a) Stage	-	1) bottom left
b) Sprite list	-	2) Right
c) Scripts tab	-	3) Right corner
d) Green flag	-	4) Top left

Ans: a-4; b-1; c-2; d-3

E. Match the following

A) Stage	-	1) Costume editor
B) Ntotepad	-	2) Scratch editor

C) File - 3) Application
D) Script editor - 4) Folger

Ans:	A	B	C	D
a)	1	2	3	4
b)	**2**	**3**	**4**	**1**
c)	1	3	2	4
d)	4	2	1	3

III. Fill in the blanks:

1. **Start** button at the left corner fo the computer and shows the list of the programs.
2. the characters on he background of a scratch window is known as **sprite**.
3. We can change the background colour by **stage**.
4. Scratch is a **Visual Programming Language**.

IV. State whether the following statement s are True or False. Correct the False statement.

1. LINUX is a multi-purpose application.
   Ans: False. LINUX is a operating system.
2. Multiple folders combine to form one file.
   Ans: False. A folder contains multiple files.
3. Scratch is an animation software.
   Ans: True
4. Scratch is a visual programming language.
   Ans: True.
5. Scratch is difficult to use and do programming.
   Ans: False. Scratch is easy to use.
6. To choose the background in scratch, we can do using stage.
   Ans: True
7. Block menu is used to choose the category of blocks.
   Ans: True
8. Scropts tab is placed on the left corner.
   Ans: False. Script tab is on the **right** side.
9. In scratch, to run a program we need to click the red button.
   Ans: False. Click the green flag to run the program.
10. Script area is used to build scripts.
    Ans: True
11. Blackboard is a good example for Visual Communication Devie.
    Ans: False. **Cinema** is a good example for Visual Communication Device.
12. the characters on the background of a scratch window are known as sprite.
    Ans: True
13. Sprite is the background appearing when we open the scratch window.
    Ans: False. Stage is the background appearing when we open the scratch window.