12th Biology Book Back Questions - New Book

12th Standard – BIO BOTANY
NEW BOOK
1.ASEXUAL AND SEXUAL REPRODUCTION IN PLANTS

I. Choose the Correct Answer

1. Choose the correct statement from the following
   a) Gametes are involved in asexual reproduction
   b) Bacteria reproduce asexually by budding
   c) Conidia formation is a method of sexual reproduction
   d) **Yeast reproduce by budding**
2. An eminent Indian embryologist is
   a) S.R.Kashyap
   b) **P.Maheswari**
   c) M.S. Swaminathan
   d) K.C.Mehta
3. Identify the correctly matched pair
   a) Tuber - Allium cepa
   b) Sucker – Pistia
   c) **Rhizome - Musa**
   d) Stolon - Zingiber
4. Pollen tube was discovered by
   a) J.G.Kolreuter
   b) **G.B.Amici**
   c) E.Strasburger
   d) E.Hanning
5. Size of pollen grain in Myosotis
   a) **10 micrometer**
   b) 20 micrometer
   c) 200 micrometer
   d) 2000 micrometer
6. First cell of male gametophyte in angiosperm is
   a) **Microspore**
   b) megaspore
   c) Nucleus
   d) Primary Endosperm Nucleus
7. Match the following

I) External fertilization	i) pollen grain
II) Androecium	ii) anther wall
III) Male gametophyte	iii) algae
IV) Primary parietal layer	iv) stamens

   a) I-iv;II-i;III-ii;IV-iii
   b) **I-iii;II-iv;III-i;IV-ii**
   c) I-iii;II-iv;III-ii,IV-I
   d) I-iii;II-i;III-iv;IV-ii
8. Arrange the layers of anther wall from locus to periphery
   a) Epidermis,middle layers, tapetum, endothecium
   b) Tapetum, middle layers, epidermis, endothecium
   c) Endothecium, epidermis, middle layers, tapetum
   d) **Tapetum, middle layers endothecium epidermis**
9. Identify the incorrect pair
   a) sporopollenin - exine of pollen grain
   b) tapetum – nutritive tissue for developing microspores
   c) **Nucellus – nutritive tissue for developing embryo**

d) obturator – directs the pollen tube into micropyle

10. Assertion : Sporopollenin preserves pollen in fossil deposits
Reason : Sporopollenin is resistant to physical and biological decomposition
a) assertion is true; reason is false
b) assertion is false; reason is true
c) Both Assertion and reason are not true
d) **Both Assertion and reason are true.**

11. Choose the correct statement(s) about tenuinucellate ovule
a) **Sporogenous cell is hypodermal**
b) Ovules have fairly large nucellus
c) sporogenous cell is epidermal
d) ovules have single layer of nucellus tissue

12. Which of the following represent megagametophyte
a) Ovule b) **Embryo sac**
c)Nucellus d)Endosperm

13. In Haplopappus gracilis, number of chromosomes in cells of nucellus is 4. What will be the chromosome number in Primary endosperm cell?
a)8 b)**12** c)6 d)2

14. Transmitting tissue is found in
a) Micropylar region of ovule b) Pollen tube wall
c) **Stylar region of gynoecium** d) Integument

15. The scar left by funiculus in the seed is
a) tegmen b) radicle
c) epicotyl d) **hilum**

16. A Plant called X possesses small flower with reduced perianth and versatile anther. The probable agent for pollination would be
a) water b) **air**
c) butterflies d) beetles

17. Consider the following statement(s)
i) In Protandrous flowers pistil matures earlier
ii) In Protogynous flowers pistil matures earlier
iii) Herkogamy is noticed in unisexual flowers
iv) Distyly is present in Primula
a) i and ii are correct b) **ii and iv are correct**
c) ii and iii are correct d) i and iv are correct

18. Coelorhiza is found in
a) **Paddy** b) Bean
c) Pea d)Tridax

19. Parthenocarpic fruits lack
a) Endocarp b) Epicarp
c) Mesocarp d) **seed**

20. In majority of plants pollen is liberated at

a) 1 celled stage
b) **2 celled stage**
c) 3 celled stage
d) 4 celled stage

2.CLASSICAL GENETICS

I. Choose the correct answer

1. Extra nuclear inheritance is a consequence of presence of genes in
   a) **Mitrochondria and chloroplasts**
   b) Endoplasmic reticulum and mitrochondria
   c) Ribosomes and chloroplast
   d) Lysososmes and ribosomes
2. In order to find out the different types of gametes produced by a pea plant having the genotype AaBb, it should be crossed to a plant with the genotype
   a) aaBB
   b) AaBB
   c) AABB
   d) **aabb**
3. How many different kinds of gametes will be produced by a plant having the genotype AABbCC?
   a) Three
   b) **Four**
   c) Nine
   d) Two
4. Which one of the following is an example of polygenic inheritance?
   a) Flower colour in Mirabilis Jalapa
   b) Production of male honey bee
   c) Pod shape in garden pea
   d) **Skin Colour in humans**
5. In Mendel's experiments with garden pea, round seed shape (RR) was dominant over wrinkled seeds (rr), yellow cotyledon (YY) was dominant over green cotyledon (yy). What are the expected phenotypesin the F_2 generation of the cross RRYY x rryy?
   a) Only round seeds with green cotyledons
   b) Only wrinkled seeds with yellow cotyledons
   c) Only wrinkled seeds with green cotyledons
   d) **Round seeds with yellow cotyledons an wrinkled seeds with yellow cotyledons**
6. Test cross involves
   a) Crossing between two genotypes with recessive trait
   b) Crossing between two F_1 hybrids
   c) **Crossing the F_1 hybrid with a double recessive genotype**
   d) Crossing between two genotypes with dominant trait
7. In pea plants, yellow seeds are dominant to green. If a heterozygous yellow seed pant is crossed with a green seeded plant, what ratio of yellow and green seeded plants would you expect in F1 generation?
   a) 9:1
   b) 1:3
   b) 3:1
   d) **50:50**
8. The genotype of a plant showing the dominant phenotype can be determined by
   a) Back cross
   b) **Test cross**
   c) Dihybrid corss
   d) Pedigree analysis
9. Select the correct statement from the ones given below with respect to dihydrid cross
   a) **Tightly linked genes on the same chromosomes show very few combinations**

b) Tightly linked genes on the same chromosomes show higher combinations
c) Genes far apart on the same chromosomes show very few recombinations
d) Genes loosely linked on the same chromosomes show similar recombinations as the tightly linked ones

10. Which Mendelian idea is depicted by a cross in which the F_1 generation resembles both the parents
a) Incomplete dominance
b) Law of dominance
c) Inheritance of one gene
d) **Co-dominance**

11.Fruit colour in squash is an example of
a) Recessive epistatsis
b) **Dominant epistasis**
c) Complementary genes
d) Inhibitory genes

12.In his classic experiments on Pea plants, Mendel did not use
a) Flowering position
b) Seed colour
c) **Pod length**
d) Seed shape

13. The epistatic effect, in which the dihybrid cross 9:3:3:1 between AaBb Aabb is modified as
a) Dominance of one allele on another allele of both loci
b) **Interaction between two alleles of different loci**
c) Dominance of one allele to another alleles of same loci
d) Interaction between two alleles of some loci

14. In a test cross involving F_1 dihybrid flies, more parental type offspring were produced than the recombination type offspring. This indicates
a) The two genes are located on two different chromosomes
b) Chromosomes failed to separate during meiosis
c) **The two genes are linked and present on the some chromosome**
d) Both of the characters are controlled by more than one gene

15.The genes controlling the seven pea characters studied by Mendel are known to be located on how many different chromosomes?
a) **Seven**
b) Six
c) Five
d) Four

16.Which of the following explains how progeny can posses the combinations of traits that none of the parent possessed?
a) Law of segregation
b) Chromosome theory
c) **Law of independent assortment**
d) Polygenic inheritance

17.“Gametes are never hybrid”. This is a statement of
a) Law of dominance
b) Law of independent assortment
c) **Law of segregation**
d) Law of random fertilization

18. Gene which suppresses other genes activity but does not lie on the same locus is called as
a) **Epistatic**
b) Supplement only
c) Hypostatic
d) Codominant

19.Pure tall plants are crossed with pure dwarf plants. In the F1 generation, all plants were tall. These tall plants of F_1 generation were selfed and the ratio of tall to dwarf plants obtained was 3:1. This is called
a) **Dominance**
b) Inheritance
c) Codominance
d) Heredity

20.The dominant epistatis ratio is

a) 9:3:3:1 b) **12:3:1**

c) 9:3:4 d) 9:6:1

21.Select the period for Mendel's hybridization experiments

a) **1856 - 1863** b) 1850 - 1870

c) 1857 - 1869 d) 1870 – 1877

22. Among the following characters which one was not considered by Mendel in his experimentation pea?

a) Stem – Tall or dwarf b) **Trichomal glandular or non-glandular**

c) Seed – Green or yellow d) Pod – Inflated or constricted

3.CHROMOSOMAL BASIS OF INHERITANCE

I. Choose the correct answer:

1. An allohexaploidy contains

a) Six different genomes b) Six copies of three different genomes

c) **Two copies of three different genomes** d) Six copies of one genome

2. The A and B genes are 10 cM apart on a chromosome. If an AB/ab heterozygote is testcrossed to ab/ab, how many of each progeny class would you expect out of 100 total progeny?

a) 25 AB, 25 ab, 25 Ab, 25 aB b) 10 AB, 10 ab

c) 45 AB, 45 ab d) **45 AB, 45 ab, 5 Ab, 5aB**

3. Match list I with list II

List I	List II
A. A pair of chromosomes extra with diploid	i) monosomy
B. One chromosome extra to the diploid	ii) tetrasomy
C. One chromosome loses from diploid	iii) trisomy
D. Two individual chromosomes lose from diploid	iv) double monosomy

a) A-i, B-iii, C-ii, D-iv b) A-ii, B-iii, C-iv, D-i

c) **A-ii, B-iii, C-i, D-iv** d) A-iii, B-ii, C-i, D-iv

4. Which of the following sentences are correct?

1. The offspring exhibit only parental combinations due to incomplete linkage
2. The linked genes exhibit some crossing over in complete linkage
3. The separation of two linked genes are possible in incomplete linkage
4. Crossing over is absent in complete linkage

a) 1 and 2 b) 2 and 3

c) **3 and 4** d) 1 and 4

5. Accurate mapping of genes can be done by three point test cross because increases

a) Possibility of single cross over

b) **Possibility of double cross over**

c) Possibility of multiple cross over

d) Possibility of recombination frequency

6. Due to incomplete linkage in maize, the ratio of parental and recombinants are

a) 50:50 b) **7:1:1:7**

c) 96.4: 3.6 d) 1:7:7:1

7. Genes G S L H are located on same chromosome. The recombination percentage is between L and G is 15%, S and L is 50%, H and S are 20%. The correct order of genes is

a) GHSL b) **SHGL**

c) SGHL d) HSLG

8. The point mutation sequence for transition, transition, transversion and transversion in DNA are

a) A to T, T to A, C to G and G to C b) **A to G, C to T, C to G and T to A**

c) C to G, A to G, T to A and G to A d) G to C, A to T, T to A and C to G

9. If haploid number in a cell is 18. The double monosomic and trisomic number will be

a) **35 and 37** b) 34 and 35

c) 37 and 35 d) 17 and 19

10. Changing the codon AGC to AGA represents

a) **missense mutation** b) nonsense mutation

c) frameshift mutation d) deletion mutation

11. Assertion (A): Gamma rays are generally use to induce mutation in wheat varieties.
Reason (R): Because they carry lower energy to non-ionize electrons from atom

a) A is correct. R is correct explanation of A

b) A is correct. R is not correct explanation of A

c) **A is correct. R is wrong explanation of A**

d) A and R is wrong

12. How many map units separate two alleles A and B if the recombination frequency is 0.09?

a) 900 cM b) 90 cM

c) **9 cM** d) 0.9 cM

4.PRINCIPLES AND PROCESSES OF BIOTECHNOLOGY

I. Choose the correct answer

1. Restriction enzymes are

a. Not always required in genetic engineering

b. Essential tools in genetic engineering

c. Nucleases that cleave DNA at specific sites

d. **both b and c**

2. Plasmids are

a. circular protein molecules b. required by bacteria

c. tiny bacteria d. **confer resistance to antibiotics**

3. EcoRI cleaves DNA at

a. AGGGTT b. GTATATC

c. **GAATTC** d. TATAGC

4. Genetic engineering is

a. making artificial genes.

b. **hybridization of DNA of one organism to that of the others.**

c. production of alcohol by using micro organisms.

d. making artificial limbs, diagnostic instruments such as ECG, EEG etc.,

5. Consider the following statements:

I. Recombinant DNA technology is popularly known as genetic engineering is a stream of biotechnology which deals with the manipulation of genetic materials by man invitro

II. pBR322 is the first artificial cloning vector developed in 1977 by Boliver and Rodriguez from E.coli plasmid

III. Restriction enzymes belongs to a class of enzymes called nucleases.

Choose the correct option regarding above statements

a. I & II
b. I & III
c. II & III
d. **I,II & III**

6. The process of recombinant DNA technology has the following steps

I. amplication of the gene

II. Insertion of recombinant DNA into the host cells

III. Cutting of DNA at specific location using restriction enzyme .

IV. Isolation of genetic material (DNA)

Pick out the correct sequence of step for recombinant DNA technology.

a. II, III, IV, I
b. IV, II, III, I
c. I, II, III, IV
d. **IV, III, I, II**

7. Which one of the following palindromic base sequence in DNA can be easily cut at about the middle by some particular restriction enzymes?

a. 5` CGTTCG 3` 3` ATCGTA 5`
b. 5` GATATG 3` 3` CTACTA 5`
c. **5` GAATTC 3` 3` CTTAAG 5`**
d. 5` CACGTA 3` 3` CTCAGT 5`

8. pBR 322, BR stands for

a. Plasmid Bacterial Recombination
b. Plasmid Bacterial Replication
c. **Plasmid Boliver and Rodriguez**
d. Plasmid Baltimore and Rodriguez

9. Which of the following one is used as a Biosensors?

a. Electrophoresis
b. **Bioreactors**
c. Vectors
d. Electroporation

10. Match the following :

Column A	Column B
1. Exonuclease	a. add or remove phosphate
2. Endonuclease	b. binding the DNA fragments
3. Alkaline Phosphatase	c. cut the DNA at terminus
4. Ligase	d. cut the DNA at middle

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

11. In which techniques Ethidium Bromide is used?

a. Southern Blotting techniques
b. Western Blotting techniques

c. Polymerase Chain Reaction d. **Agrose Gel Electroporosis**

12. Assertion : Agrobacterium tumifaciens is popular in genetic engineering because this bacteriumis associated with the root nodules of all cereals and pulse crops
Reason: A gene incorporated in the bacterial chromosomal genome gets atomatically transferred to the cross with which bacterium is associated.
    a) Both assertion and reason are true. But 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) **Assertion is false, but reason is true.**
    e) Both assertion and reason are false.
13. Which one of the following is not correct statement.
    a) **Ti plasmid causes the bunchy top disease**
    b) Multiple cloning site is known as Polylinker
    c) Non viral method transfection of Nucleic acid in cell
    d) Polylactic acid is a kind of biodegradable and bioactive thermoplastic.
14. An analysis of chromosomal DNA using the southern hybridisation technique does not use
    a) Electrophoresis b) Blotting
    c) Autoradiography d) **Polymerase Chain Reaction**
15. An antibiotic gene in a vector usually helps in the selection of
    a) **Competent cells** b) Transformed cells
    c) Recombinant cells d) None of the above
16. Some of the characteristics of Bt cotton are
    a) Long fibre and resistant to aphids
    b) Medium yield, long fibre and resistant to beetle pests
    c) high yield and production of toxic protein crystals which kill dipteran pests.
    d) **High yield and resistant to ball worms**

5. PLANT TISSUE CULTURE

I. Choose the correct answer:

1. Totipotency refers to

    a) **capacity to generate genetically identical plants**.

    b) capacity to generate a whole plant from any plant cell / explant.

    c) capacity to generate hybrid protoplasts.

    d) recovery of healthy plants from diseased plants.

2.Micro propagation involves

    a) vegetative multiplication of plants by using micro-organisms.

b) **vegetative multiplication of plants by using small explants.**

c) vegetative multiplication of plants by using microspores.

d) Non-vegetative multiplication of plants by using microspores and megaspores.

3. Match the following

Column A	**Column B**
1) Totipotency	A) Reversion of mature cells into meristerm
2) Dedifferentiation	B) Biochemical and structural changes of cells
3) Explant	C) Properties of living cells develops into entire plant
4) Differentiation	D) Selected plant tissue transferred to culture medium

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

4. The time duration for sterilization process by using autoclave is _____ minutes and the temperature is _____

a) 10 to 30 minutes and 125° C

b) **15 to 30 minutes and 121° C**

c) 15 to 20 minutes and 125° C

d) 10 to 20 minutes and 121° C

5.Which of the following statement is correct

a) Agar is not extracted from marine algae such as seaweeds.

b) **Callus undergoes differentiation and produces somatic embryoids.**

c) Surface sterilization of explants is done by using mercuric bromide

d) PH of the culture medium is 5.0 to 6.0

6. Select the incorrect statement from given statement

a) A tonic used for cardiac arrest is obtained from Digitalis purpuria

b) Medicine used to treat Rheumatic pain is extracted from Capsicum annum

c) An anti malarial drug is isolated from Cinchona officinalis.

d) **Anti-cancinogenic property is not seen in Catharanthus roseus.**

7.Virus free plants are developed from

a) Organ culture b) **Meristem culture**

c) Protoplast culture d) Cell suspension culture

8.The prevention of large scale loss of biological interity

a) Biopatent b) Bioethics

c) **Biosafety** d) Biofuel

9.Cryopreservation means it is a process to preserve plant cells, tissues or organs

a) at very low temperature by using ether.

b) at very high temperature by using liquid nitrogen

c) **at very low temperature of -196 by using liquid nitrogen**

d) at very low temperature by using liquid nitrogen

10.Solidifying agent used in plant tissue culture is

a) Nicotinic acid b) Cobaltous chloride

c) EDTA d) **Agar**

6.PRINCIPLES OF ECOLOGY

I. Choose the correct answer:

1. Arrange the correct sequence of ecological hierarchy starting from lower to higher level.
   a) Individual organism → Population Landscape → Ecosystem
   b) Landscape → Ecosystem → Biome → Biosphere
   c) **community → Ecosystem → Landscape → Biome**
   d) Population → organism → Biome → Landscape
2. Ecology is the study of an individual species is called
   i) Community ecology ii) Autecology
   iii) Species ecology iv) Synecology

a) i only
b) ii only
c) i and iv only
d) **ii and iii only**

3. A specific place in an ecosystem, where an organism lives and performs its functions is
a) habitat
b) **niche**
c) landscape
d) biome

4. Read the given statements and select the correct option.
i) Hydrophytes possess aerenchyma to support themselves in water.
ii) Seeds of Viscum are positively photoblastic as they germinate only in presence of light.
iii) Hygroscopic water is the only soil water available to roots of plant growing in soil as it is present inside the micropores.
iv) High temperature reduces use of water and solute absorption by roots.
a) i, ii, and iii only
b) ii, iii and iv
c) ii and iii only
d) **i and ii only**

5. Which of the given plant produces cardiac glycosides?
a) **Calotropis**
b) Acacia
c) Nepenthes
d) Utricularia

6. Read the given statements and select the correct option.
i) Loamy soil is best suited for plant growth as it contains a mixture of silt, sand and clay.
ii) The process of humification is slow in case of organic remains containing a large amount of lignin and cellulose.
iii) Capillary water is the only water available to plant roots as it is present inside the micropores.
iv) Leaves of shade plant have more total chlorophyll per reaction centre, low ratio of chl a and chl b are usually thinner leaves.
a) i, ii and iii only
b) ii, iii and iv only
c) **i, ii and iv only**
d) ii and iii only

7. Read the given statements and select the correct option.
Statement A : Cattle do not graze on weeds of Calotropis.
Statement B : Calotropis have thorns and spines, as defense against herbivores.
a) Both statements A and B are incorrect.
b) **Statement A is correct but statement B is incorrect.**
c) Both statements A and B are correct but statement B is not the correct explanation of statement A.
d) Both statements A and B are correct and statement B is the correct explanation of statement A.

8. In soil water available for plants is
a) gravitational water
b) chemically bound water
c) **capillary water**
d) hygroscopic water

9. Read the following statements and fill up the blanks with correct option.
i) Total soil water content in soil is called _____
ii) Soil water not available to plants is called _____
iii) Soil water available to plants is called _____

	(i)	(ii)	(iii)
(a)	**Holard**	**Echard**	**Chresard**

(b)	Echard	Holard	Chresard
(c)	Chresard	Echard	Holard
(d)	Holard	Chresard	Echard

10. Column I represent the size of the soil particles and Column II represents type of soil components. Which of the following is correct match for the Column I and Column IL

Column – I	Column - II
I). 0.2 to 2.00 mm	i) Slit soil
II) Less than 0.002 mm	ii) Clayey soil
III) 0.002 to 0.02 mm	iii) Sandy soil
IV) 0.002 to 0.2 mm	iv) Loamy soil

	I	II	III	IV
a)	ii	iii	iv	I
b)	iv	i	iii	Ii
c)	**iii**	**ii**	**i**	**iv**
d)	None of these			

11. The plant of this group are adapted to live partly in water and partly above substratum and free from water

a) Xerophytes
b) Mesophytes
c) Hydrophytes
d) **Halophytes**

12 . Identify the A, B, C and D in the given table

Interaction	Effects on species X	Effects on species Y
Mutualism	A	(+)
B	(+)	(-)
Competition	(-)	C
D	(-)	0

	A	B	C	D
a)	**(+)**	**Parasitism**	**(-)**	**Amensalism**
b)	(-)	Mutalism	(+)	Competition
c)	(+)	Competition	(0)	Mutalism
d)	(0)	Amensalism	(+)	Parasitism

13. Ophrys an orchid resembling the female of an insect so as to able to get pollinated is due to phenomenon of

a) Myrmecophily
b) Ecological equivalents
c) **Mimicry**
d) None of these

14. A free living nitrogen fixing cyanobacterium which can also form symbiotic association with the water fern Azolla

a) Nostoc
b) **Anabaena**
c) chlorella
d) Rhizobium

15. Pedogenesis refers to

a) Fossils
b) Water

c) Population d) **Soil**

16. Mycorrhiza promotes plant growth by
    a) Serving as a plant growth regulators
    b) **Absorbing inorganic ions from soil**
    c) Helping the plant in utilizing atmospheric nitrogen
    d) Protecting the plant from infection
17. Which of the following plant has a non-succulent xerophytic and thick leathery leaves with waxy coating
    a) Bryophyllum b) **Ruscus**
    c) Nerium d) Calotropis
18. In a fresh water environment like pond, rooted autotrophs are
    a) **Nymphaea and typha** b) Ceratophyllum and Utricularia
    c) Wolffia and pistia d) Azolla and lemna
19. Match the following and choose the correct combination from the options given below:

Column I (Interaction)	Column II (Examples)
I. Mutualism	i). Trichoderma and Penicillium
II. Commensalism	ii). Balanophora, Orobanche
III. Parasitism	iii). Orchids and Ferns
IV. Predation	iv). Lichen and Mycorrhiza
V. Amensalism	v). Nepenthes and Diaonaea

	I	II	III	IV	V
a)	i	ii	iii	iv	v
b)	ii	iii	iv	v	i
c)	iii	iv	v	i	ii
d)	**iv**	**iii**	**ii**	**v**	**i**

20. Strong, sharp spines that get attached to animal's feet are found in the fruits of
    a) Argemone b) **Ecballium**
    c) Heritier d) Crossandra
21. Sticky glands of Boerhaavia and Cleome support
    a) Anemochory b) **Zoochory**
    c) Autochory d) Hydrochory

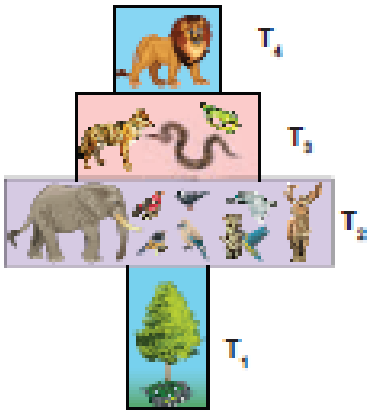
7.ECOSYSTEM

I. Choose the correct answer

1. Which of the following is not a abiotic component of the ecosystem?
    a) **Bacteria** b) Humus
    c) Organic compounds d) Inorganic compounds
2. Which of the following is / are not a natural ecosystem?
    a) Forest ecosystem b) **Rice field**
    c) Grassland ecosystem d) Desert ecosystem
3. Pond is a type of

a) forest ecosystem
b) grassland ecosystem
c) marine ecosystem
d) **fresh water ecosystem**

4. Pond ecosystem is
   a) not self sufficient and self regulating
   b) partially self sufficient and self regulating
   c) self sufficient and not self regulating
   d) **self sufficient and self regulating**
5. Profundal zone is predominated by heterotrophs in a pond ecosystem, because of
   a) with effective light penetration
   b) **no effective light penetration**
   c) complete absence of light
   d) a and b
6. Solar energy used by green plants for photosynthesis is only
   a) 2 – 8%
   b) **2 – 10%**
   c) 3 – 10%
   d) 2 – 9%
7. Which of the following ecosystem has the highest primary productivity?
   a) Pond ecosystem
   b) Lake ecosystem
   c) Grassland ecosystem
   d) **Forest ecosystem**
8. Ecosystem consists of
   a) decomposers
   b) producers
   c) consumers
   d) **all of the above**
9. Which one is in descending order of a food chain
   a) Producers → Secondary consumers → Primary consumers → Tertiary consumers
   b) Tertiary consumers → Primary consumers → Secondary consumers → Producers
   c) **Tertiary consumers → Secondary consumers → Primary consumers → Producers**
   d) Tertiary consumers → Producers → Primary consumers → Secondary consumers
10. Significance of food web is / are
    a) it does not maintain stability in nature
    b) it shows patterns of energy transfer
    c) it explains species interaction
    d) **b and c**
11. The following diagram represents



    a) pyramid of number in a grassland ecosystem
    b) pyramid of number in a pond ecosystem
    c) **pyramid of number in a forest ecosystem**
    d) pyramid of biomass in a pond ecosystem
12. Which of the following is / are not the mechanism of decomposition
    a) Eluviation
    b) Catabolism

c) **Anabolism** d) Fragmentation

13. Which of the following is not a sedimentary cycle
    a) Nitrogen cycle b) Phosphorous cycle
    c) Sulphur cycle d) **Calcium cycle**
14. Which of the following are not regulating services of ecosystem services
    i) Genetic resources
    ii) Recreation and aesthetic values
    iii) Invasion resistance
    iv) Climatic regulation
    a) **i and iii** b) ii and iv
    c) i and ii d) i and iv

8.ENVIRONMENTAL ISSUES

I. Choose the correct answer

1. Which of the following would most likely help to slow down the greenhouse effect.
    a) Converting tropical forests into grazing land for cattle.
    b) Ensuring that all excess paper packaging is buried to ashes.
    c) **Redesigning landfill dumps to allow methane to be collected.**
    d) Promoting the use of private rather than public transport.
2. With respect to Eichhornia
    Statement A: It drains off oxygen from water and is seen growing in standing water.
    Statement B: It is an indigenous species of our country.
    a) **Statement A is correct and Statement B is wrong.**
    b) Both Statements A and B are correct.
    c) Statement A is correct and Statement B is wrong.
    d) Both statements A and B are wrong.
3. Find the wrongly matched pair.
    a) Endemism - Species confined to a region and not found anywhere else.
    b) Hotspots - Western ghats
    c) **Ex-situ Conservation - Zoological parks**
    d) Sacred groves - Saintri hills of Rajasthan
    e) Alien sp. of India - Water hyacinth
4. Depletion of which gas in the atmosphere can lead to an increased incidence of skin cancer?
    a) Ammonia b) Methane
    c) Nitrous oxide d) **Ozone**
5. One green house gas contributes 14% of total global warming and another contributes 6%. These are respectively identified as
    a) N_20 and CO_2 b) **CFCs and N_20**
    c) CH_4 and CO_2 d) CH_4 and CFCS
6. One of the chief reasons among the following for the depletion in the number of species making endangered is
    a) over hunting and poaching b) green house effect

c) competition and predation d) **habitat destruction**

7. Deforestation means
   a) growing plants and trees in an area where there is no forest
   b) growing plants and trees in an area where the forest is removed
   c) growing plants and trees in a pond
   d) **removal of plants and trees**
8. Deforestation does not lead to
   a) **Quick nutrient cycling**
   b) soil erosion
   c) alternation of local weather conditions
   d) Destruction of natural habitat weather conditions
9. The unit for measuring ozone thickness
   a) Joule b) Kilos
   c) **Dobson** d) Watt
10. People's movement for the protection of environment in Sirsi of Karnataka is
   a) Chipko movement b) Amirtha Devi Bishwas movement
   c) **Appiko movement** d) None of the above
11. The plants which are grown in silivpasture system are
   a) **Sesbania and Acacia** b) Solenum and Crotalaria
   c) Clitoria and Begonia d) Teak and sandal

9.PLANT BREEDING

I. Choose the correct answer

1. Assertion: Genetic variation provides the raw material for selection
   Reason: Genetic variations are differences in genotypes of the individuals.
   a) Assertion is right and reason is wrong.
   b) Assertion is wrong and reason is right.
   c) **Both reason and assertion is right.**
   d) Both reason and assertion is wrong.
2. While studying the history of domestication of various cultivated plants _____ were recognized earlier
   a) **Centres of origin** b) Centres of domestication
   c) Centres of hybrid d) Centres of variation
3. Pick out the odd pair.
   a) Mass selection - Morphological characters
   b) Purline selection - Repeated self pollination
   c) **Clonal selection** - **Sexually propagated**
   d) Natural selection - Involves nature
4. Match Column I with Column II

Column I	Column II
i) William S. Gaud	I) Heterosis

ii) Shull II) Mutation breeding
iii) Cotton Mather III) Green revolution
iv) Muller and Stadler IV) Natural hybridization

a) i – I, ii – II, iii – III, iv – IV b) **i – III, ii – I, iii – IV, iv – II**
c) i – IV, ii – II, iii – I, iv – IV d) i – II, ii – IV, iii – III, iv – I

5.The quickest method of plant breeding is

a) Introduction b) **Selection**
c) Hybridization d) Mutation breeding

6.Desired improved variety of economically useful crops are raised by

a) Natural Selection b) **hybridization**
c) mutation d) biofertilisers

7.Plants having similar genotypes produced by plant breeding are called

a) **clone** b) haploid
c) autopolyploid d) genome

8.Importing better varieties and plant environment is called

a) **cloning** b) heterosis
c) selection d) introduction

9.Dwarfing gene of wheat is

a) pal 1 b) Atomita 1
c) **Norin 10** d) pelita 2

10.Crosses between the plants of the same variety are called

a) interspecific b) inter varietal
c) **intra varietal** d) inter generic

11.Progeny obtained as a result of repeat self pollination a cross pollinated crop to called

a) pure line b) pedigree line
c) **inbreed line** d) heterosis

12.Jaya and Ratna are the semi dwarf varieties of

a) wheat b) **rice**
c) cowpea d) mustard

13.Which one of the following are the species that are crossed to give sugarcane varieties with high sugar, high yield, thick stems and ability to grow in the sugarcane belt of North India?

a) *Saccharum robustum* and *Saccharum officinarum*
b) ***Saccharum barberi* and *Saccharum officinarum***
c) *Saccharum sinense* and *Saccharum officinarum*
d) *Saccharum barberi* and *Saccharum robustum*

14.Match column I (crop) with column II (Corresponding disease resistant variety) and select the correct option from the given codes.

Column I	Column II
I) Cowpea	i) Himgiri
II) Wheat	ii) Pusa komal
III) Chilli	iii) Pusa Sadabahar
IV) Brassica	iv) Pusa Swarnim

	I	II	III	IV
a)	iv	iii	ii	i
b)	**ii**	**i**	**iii**	**iv**
c)	ii	iv	i	iii
d)	i	iii	iv	ii

15.A wheat variety, Atlas 66 which has been used as a donor for improving cultivated wheat, which is rich in

a) iron b) carbohydrates

c) **proteins** d) vitamins

16.Which one of the following correct matches with its resistance to a disease?

Variety	Resistance to disease
a) Pusa Komal	**Bacterial blight**
b) Pusa Sadabahar	White rust
c) Pusa Shubhra	Chilli mosaic virus
d) Brassica	Pusa swarnim

17. Which of the following is incorrectly paired?

a) Wheat - Himgiri

b) Milch breed - Sahiwal

c) Rice - Ratna

d) **Pusa Komal** - **Brassica**

18. Match list I with list II

List I	List II
Biofertilizer	Organisms
i) Free living N_2	a) Aspergillus
ii) Symbiotic N_2	b) Amanita
iii) P Solubilizing	c) Anabaena azollae
iv) P Mobilizing	d) Azotobactor

a. i-c, ii-a, iii-b, iv-d b. **i-d, ii-c, iii-a, iv-b.**

c. i-a, ii-c, iii-b, iv-d c. i-b, ii-a, iii-d, iv-c.

10.ECONOMICALLY USEFUL PLANTS AND ENTREPRENEURIAL BOTANY

I. Choose the Correct Answer

1.Consider the following statements and choose the right option.

i) Cereals are members of grass family.

ii) Most of the food grains come from monocotyledon.

a) (i) is correct and (ii) is wrong
b) **Both (i) and (ii) are correct**
c) (i) is wrong and (ii) is correct
d) Both (i) and (ii) are wrong

2. Assertion: Vegetables are important part of healthy eating.

Reason: Vegetables are succulent structures of plants with pleasant aroma and flavours.

a) **Assertion is correct, Reason is wrong**
b) Assertion is wrong, Reason is correct
c) Both are correct and reason is the correct explanation for assertion.
d) Both are correct and reason is not the correct explanation for assertion.

3. Groundnut is native of _____

a) Philippines
b) India
c) North America
d) **Brazil**

4. Statement A: Coffee contains caffeine

Statement B: Drinking coffee enhances cancer

a) **A is correct, B is wrong**
b) A and B – Both are correct
c) A is wrong, B is correct
d) A and B – Both are wrong

5. Tectona grandis is coming under family

a) **Lamiaceae**
b) Fabaceae
c) Dipterocaipaceae
d) Ebenaceae

6. *Tamarindus indica* is indigenous to

a) **Tropical African region**
b) South India, Sri Lanka
c) South America, Greece
d) India alone

7. New world species of cotton

a) *Gossipium arboretum*
b) *G.herbaceum*
c) Both a and b
d) ***G.barbadense***

8. Assertion: Turmeric fights various kinds of cancer

Reason: Curcumin is an anti-oxidant present in turmeric

a) Assertion is correct, Reason is wrong
b) Assertion is wrong, Reason is correct
c) **Both are correct**
d) Both are wrong

9. Find out the correctly matched pair.

a) Rubber Shorea robusta
b) **Dye Lawsonia inermis**
c) Timber Cyperus papyrus
d) Pulp Hevea brasiliensis

10. Observe the following statements and pick out the right option from the following:

Statement I – Perfumes are manufactured from essential oils.

Statement II – Essential oils are formed at different parts of the plants.

a) Statement I is correct
b) Statement II is correct
c) **Both statements are correct**
d) Both statements are wrong

11. Observe the following statements and pick out the right option from the following:

Statement I: The drug sources of Siddha include plants, animal parts, ores and minerals.

Statement II: Minerals are used for preparing drugs with long shelf-life.

a) Statement I is correct
b) **Statement II is correct**
c) Both statements are correct
d) Both statements are wrong

12. The active principle trans-tetra hydro canabial is present in

a) Opium
b) Curcuma
c) **Marijuana**
d) Andrographis

13. Which one of the following matches is correct?

a) Palmyra - Native of Brazil
b) Saccharun - Abundant in Kanyakumari
c) **Steveocide - Natural sweetener**
d) Palmyra sap - Fermented to give ethanol

14. The only cereal that has originated and domesticated from the New world.

a) *Oryza sativa*
b)*Triticum asetumn*
c) *Triticum duram*
d) ***Zea mays***

12th Standard – BIO ZOOLOGY
NEW BOOK
1.REPRODUCTION IN ORGANISMS

I. Choose the Correct Answer

1. In which type of parthenogenesis are only males produced?
   a) **Arrhenotoky**
   b) Thelytoky
   c) Amphitoky
   d) Both a and b
2. Animals giving birth to young ones:
   a) Oviparous
   b) Ovivіviparous
   c) **Viviparous**
   d) Both a and b
3. The mode of reproduction in bacteria is by

a) Formation of gametes b) Endospore formation

c) **Conjugation** d) Zoospore formation

4. In which mode of reproduction variations are seen

a) Asexual b) Parthenogenesis

c) **Sexual** d) Both a and b

5. Assertion and reasoning questions:

In each of the following questions there are two statements. One is assertion (A) and other is reasoning (R). Mark the correct answer as

A. If both A and R are true and R is correct explanation for A

B If both A and R are true but R is not the correct explanation for A

C. If A is true but R is false

D. If both A and R are false.

I. Assertion: In bee society, all the members are diploid except drones.

Reason: Drones are produced by parthenogenesis.

A B C D

II. Assertion: Offsprings produced by asexual reproduction are genetically identical to the parent.

Reason: Asexual reproduction involves only mitosis and no meiosis.

A B C D

III. Assertion: Viviparous animals give better protection to their offsprings.

Reason: They lay their eggs in the safe places of the environment.

A B C **D**

2. HUMAN REPRODUCTION

I. Choose the correct answer

1. The mature sperms are stored in the

a. Seminiferous tubules b.Vas deferens

c. **Epididymis** d. Seminal vesicle

2. The male sex hormone testosterone is secreted from

a. Sertoli cells b. **Leydig cell**

c. Epididymis d. Prostate gland

3. The glandular accessory organ which produces the largest proportion of semen is

a. **Seminal vesicle** b. Bulbourethral gland

c. Prostate gland d. Mucous gland

4. The male homologue of the female clitoris is

a. Scrotum b. **Penis**

c. Urethra d.Testis

5. The site of embryo implantation is the

a. **Uterus** b. Peritoneal cavity

c. Vagina d. Fallopian tube

6. The foetal membrane that forms the basis of the umbilical cord is

a. **Allantois** b. Amnion

c. Chorion d. Yolk sac

7. The most important hormone in intiating and maintaining lactation after birth is

a. Oestrogen
b. FSH
c. **Prolactin**
d. Oxytocin

8. Mammalian egg is
a. Mesolecithal and non cleidoic
b. Microlecithal and non cleidoic
c. **Alecithal and non cleidoic**
d. Alecithal and cleidoic

9. The process which the sperm undergoes before penetrating the ovum is
a. Spermiation
b. Cortical reaction
c. Spermiogenesis
d. **Capacitation**

10. The milk secreted by the mammary glands soon after child birth is called
a. Mucous
b. **Colostrum**
c. Lactose
d. Sucrose

11. Colostrum is rich in
a. Ig E
b. **Ig A**
c. Ig D
d. Ig M

12. The Androgen Binding Protein (ABP) is produced by
a. Leydig cells
b. Hypothalamus
c. **Sertoli cells**
d. Pituitary gland

13. Which one of the following menstrual irregularities is correctly matched?
a. Menorrhagia – excessive menstruation
b. **Amenorrhoea - absence of menstruation**
c. Dysmenorrhoea - irregularity of menstruation
d. Oligomenorrhoea – painful menstruation

14. Find the wrongly matched pair
a. Bleeding phase - fall in oestrogen and progesterone
b. Follicular phase - rise in oestrogen
c. **Luteal phase - rise in FSH level**
d. Ovulatory phase - LH surge

Answer the following type of questions

Assertion (A) and Reason (R)
a. A and R are true, R is the correct explanation of A
b. A and R are true, R is not the correct explanation of A
c. A is true, R is false
d. Both A and R are false

15. A – In human male, testes are extra abdominal and lie in scrotal sacs.
R – Scrotum acts as thermoregulator and keeps temperature lower by 2ºC for normal sperm production .
(a) **A and R are true, R is the correct explanation of A**

16. A – Ovulation is the release of ovum from the Graafian follicle.
R – It occurs during the follicular phase of the menstrual cycle.
(c) **A is true, R is false**

17. A – Head of the sperm consists of acrosome and mitochondria.
R – Acrosome contains spiral rows of mitochondria.
(d) **Both A and R are false**

3.REPRODUCTIVE HEALTH

I. Choose the correct answer:

1. Which of the following is correct regarding HIV, hepatitis B, gonorrhoea and trichomoniasis?
   (a) Gonorrhoea is a STD whereas others are not.
   (b) Trichomoniasis is a viral disease whereas others are bacterial.
   (c) **HIV is a pathogen whereas others are diseases.**
   (d) Hepatitis B is eradicated completely whereas others are not.
2. Which one of the following groups includes sexually transmitted diseases caused by bacteria only?
   (a) Syphilis, gonorrhoea and candidiasis
   (b) **Syphilis, chlamydiasis and gonorrhoea**
   (c) Syphilis, gonorrhoea and trichomoniasis
   (d) Syphilis, trichomoniasis and pediculosis
3. Identify the correct statements from the following
   (a) Chlamydiasis is a viral disease.
   (b) Gonorrhoea is caused by a spirochaete bacterium, Treponema palladium.
   (c) The incubation period for syphilis is 2 to 14 days in males and 7 to 21 days in females.
   (d) **Both syphilis and gonorrhoea are easily cured with antibiotics.**
4. A contraceptive pill prevents ovulation by
   (a) blocking fallopian tube
   (b) **inhibiting release of FSH and LH**
   (c) stimulating release of FSH and LH
   (d) causing immediate degeneration of released ovum.
5. The approach which does not give the defined action of contraceptive is

(a)	Hormonal contraceptive	Prevents entry of sperms, prevent ovulation and fertilization
(b)	**Vasectomy**	**Prevents spermatogenesis**
(c)	Barrier method	Prevents fertilization
(d)	Intra uterine device	Increases phagocytosis of sperms, suppresses sperm motility and fertilizing capacity of sperms

6. Read the given statements and select the correct option.

Statement 1: Diaphragms, cervical caps and vaults are made of rubber and are inserted into the female reproductive tract to cover the cervix before coitus.

Statement 2: They are chemical barriers of conception and are reusable.

   (a) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
   (b) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
   (c) **Statement 1 is correct but statement 2 is incorrect.**
   (d) Both statements 1 and 2 are incorrect.
7. Match column I with column II and select the correct option from the codes given below.

Column I	Column II
A. Copper releasing IUD	(i) LNG-20
B. Hormone releasing	(ii) Lippes loop IUD
C. Non medicated IUD	(iii) Saheli

D. Mini pills	(iv) Multiload-375

(a) A-(iv), B-(ii), C-(i), D-(iii) (b) A-(iv), B-(i), C-(iii), D-(ii)
(c) A-(i), B-(iv), C-(ii), D-(iii) (d) **A-(iv), B-(i), C-(ii), D-(iii)**

8. Select the incorrect action of hormonal contraceptive pills from the following
(a) **Inhibition of spermatogenesis.**
(b) Inhibition of ovulation.
(c) Changes in cervical mucus impairing its ability to allow passage and transport of sperms.
(d) Alteration in uterine endometrium to make it unsuitable for implantation.

4. PRINCIPLES OF INHERITANCE AND VARIATION

I. Choose the correct answer

1. Haemophilia is more common in males because it is a
a) Recessive character carried by Y-chromosome
b) Dominant character carried by Y-chromosome
c) Dominant trait carried by X-chromosome
d) **Recessive trait carried by X-chromosome**

2. ABO blood group in man is controlled by
a) **Multiple alleles** b) Lethal genes
c) Sex linked genes d) Y-linked genes

3. Three children of a family have blood groups A, AB and B. What could be the genotypes of their parents?
a) I^A I^B and ii b) **I^A I^O and I^B I^O**
c) I^B I^B and I^A I^A d) I^A I^A and ii

4. Which of the following is not correct?
a) Three or more alleles of a trait in the population are called multiple alleles.
b) A normal gene undergoes mutations to form many alleles
c) **Multiple alleles map at different loci of a chromosome**
d) A diploid organism has only two alleles out of many in the population

5. Which of the following phenotypes in the progeny are possible from the parental combination AxB?
a) A and B only b) A,B and AB only
c) AB only d) **A,B,AB and O**

6.Which of the following phenotypes is not possible in the progeny of the parental genotypic combination I^AI^O x I^AI^B ?
a) AB b) **O** c) A d) B

7.Which of the following is true about Rh factor in the offspring of a parental combination DdXDd (both Rh positive)?
a) All will be Rh-positive b) Half will be Rh positive
c) About ¾ will be Rh negative d) **About one fourth will be Rh negative**

8. What can be the blood group of offspring when both parents have AB blood group?
a) AB only b) **A, B and AB**

c) A, B, AB and O d) A and B only

9.If the childs blood group is 'O' and fathers blood group is 'A' and mother's blood group is 'B' the genotype of the parents will be

a) $I^A I^A$ and $I^B I^O$ b) **$I^A I^O$ and $I^B I^O$**

c) $I^A I^O$ and $I^O I^O$ d) $I^O I^O$ and $I^B I^B$

10. XO type of sex determination and XY type of sex determination are examples of

a) **Male heterogamety** b) Female heterogamety

c) Male homogamety d) Both (b) and (c)

11. In an accident there is great loss of blood and there is no time to analyse the blood group which blood can be safely transferred?

a) **'O' and Rh negative** b) 'O' and Rh positive

c)'B' and Rh negative d) 'AB' and Rh positive

12.Father of a child is colourblind and mother is carrier for colourblindness, the probability of the child being colourblind is

a)25% b) **50%** c) 100% d) 75%

13. A marriage between a colourblind man and a normal woman produces

a) **All carrier daughters and normal sons**

b) 50% carrier daughters, 50% normal daughters

c) 50% colourblind sons, 50% normal sons

d) All carrier offsprings

14. Mangolism is a genetic disorder which is caused by the presence of an extra chromosome number

a)20 b) **21** c) 4 d) 23

15. Klinefelters' syndrome is characterized by a karyotype of

a)XYY b) XO c) XXX d) **XXY**

16. Females with Turners' syndrome have

a) Small uterus b) Rudimentary ovaries

c) Underdeveloped breasts d) **All of these**

17. Pataus' syndrome is also referred to as

a) **13-Trisomy** b) 18-Trisormy

c) 21-Trisormy d) None of these

18. Who is the founder of Modern Eugenics movement?

a) Mendel b) Darwin

c) **Fransis Galton** d) Karl pearson

19. Improvement of human race by encouraging the healthy persons to marry early and produce large number of children is called

a) **Positive eugenics** b) Negative eugenics

c) Positive euthenics d) Positive euphenics

20.The _____deals with the control of several inherited human diseases especially inborn errors of metabolism

a) **Euphenics** b) Eugenics

c) Euthenics d) All of these

21. "Universal Donor" and "Universal Recipients" blood group are _____and_____respectively

a) AB, O b) **O, AB** c) A, B d) B, A

22. ZW-ZZ system of sex determination occurs in
    a) Fishes b) Reptiles
    c) Birds d) **All of these**
23. Co-dominant blood group is
    a)A b) **AB** c) B d) O
24. Which of the following is incorrect regarding ZW-ZZ type of sex determination?
    a) It occurs in birds and some reptiles
    b) **Females are homogametic and males are heterogametic**
    c) Male produce two types of gametes
    d) It occurs in gypsy moth

5. MOLECULAR GENETICS

I. Choose the correct answer:

1. Hershey and Chase experiment with bacteriophage showed that
    a) Protein gets into the bacterial cells b) **DNA is the genetic material**
    c) DNA contains radioactive sulphur d) Viruses undergo transformation
2. DNA and RNA are similar with respect to
    a) Thymine as a nitrogen base
    b) A single-stranded helix shape
    c) **Nucleotide containing sugars, nitrogen bases and phosphates**
    d) The same sequence of nucleotides for the amino acid phenyl alanine
3. A mRNA molecule is produced by
    a) Replication b) **Transcription**
    c) Duplication d) Translation
4. The total number of nitrogenous bases in human genome is estimated to be about
    a) 3.5 million b) 35000
    c) 35 million d) **3.1 billion**
5. E. coli cell grown on 15N medium are transferred to 14N medium and allowed to grow for two generations. DNA extracted from these cells is ultracentrifuged in a cesium chloride density gradient. What density distribution of DNA would you expect in this experiment?
    (a) One high and one low density band.
    (b) One intermediate density band.
    (c) One high and one intermediate density band.
    (d) **One low and one intermediate density band.**
6. What is the basis for the difference in the synthesis of the leading and lagging strand of DNA molecules?
    (a) Origin of replication occurs only at the 5' end of the molecules.
    (b) DNA ligase works only in the 3' → 5' direction.
    (c) **DNA polymerase can join new nucleotides only to the 3' end of the growing stand.**
    (d) Helicases and single-strand binding proteins that work at the 5' end.

7. Which of the following is the correct sequence of event with reference to the central dogma?
   (a) Transcription, Translation, Replication
   (b) Transcription, Replication, Translation
   (c) Duplication, Translation, Transcription
   (d) **Replication, Transcription, Translation**
8. Which of the following statements about DNA replication is not correct?
   (a) Unwinding of DNA molecule occurs as hydrogen bonds break.
   (b) **Replication occurs as each base is paired with another exactly like it.**
   (c) Process is known as semi conservative replication because one old strand is conserved in the new molecule.
   (d) Complementary base pairs are held together with hydrogen bonds.
9. Which of the following statements is not true about DNA replication in eukaryotes?
   (a) Replication begins at a single origin of replication.
   (b) Replication is bidirectional from the origins.
   (c) Replication occurs at about 1 million base pairs per minute.
   (d) **There are numerous different bacterial chromosomes, with replication ocurring in each at the same time.**
10. The first codon to be deciphered was _____ which codes for _____.
   (a) AAA, proline (b) GGG, alanine
   (c) **UUU, Phenylalanine** (d)TTT, arginine
11. Meselson and Stahl's experiment proved
   (a) Transduction (b) Transformation
   (c) DNA is the genetic material (d) **Semi-conservative nature of DNA replication**
12. Ribosomes are composed of two subunits; the smaller subunit of a ribosome has a binding site for _____ and the larger subunit has two binding sites for two _____. **Ans (mRNA, tRNA)**
13. An operon is a:
   (a) Protein that suppresses gene expression
   (b) Protein that accelerates gene expression
   (c) **Cluster of structural genes with related function**
   (d) Gene that switched other genes on or off
14. When lactose is present in the culture medium:
   (a) Transcription of lac y, lac z, lac a genes occurs.
   (b) Repressor is unable to bind to the operator.
   (c) Repressor is able to bind to the operator.
   (d) **Both (a) and (b) are correct.**

6.EVOLUTION

I. Choose the correct answer:

1. The first life on earth originated
   a) in air b) on land
   c) **in water** d) on mountain

2) Who published the book "Origin of species by Natural Selection" in 1859?

a) **Charles Darwin** b) Lamarck
c) Weismann d) Hugo de Vries

3) Which of the following was the contribution of Hugo de Vries?
a) **Theory of mutation**
b) Theory of natural Selection
c) Theory of inheritance of acquired characters
d) Germplasm theory

4) The wings of birds and butterflies is an example of
a) Adaptive radiation b) **convergent evolution**
c) divergent evolution d) variation

5) The phenomenon of " Industrial Melanism" demonstrates
a) **Natural selection** b) induced mutation
c) reproductive isolation d) geographical isolation

6) Darwin's finches are an excellent example of
a) connecting links b) seasonal migration
c) **adaptive radiation** d) parasitism

7) Who proposed the Germplasm theory?
a) Darwin b) **August Weismann**
c) Lamarck d) Alfred Wallace

8) The age of fossils can be determined by
a) electron microscope b) weighing the fossils
c) **carbon dating** d) analysis of bones

9) Fossils are generally found in
a) igneous rocks b) metamorphic rocks
c) volcanic rocks d) **sedimentary rocks**

10) Evolutionary history of an organism is called
a) ancestry b) ontogeny
c) **phylogeny** d) paleontology

11) The golden age of reptiles was
a) **Mesozoic era** b) Cenozoic era
c) Paleozoic era d) Proterozoic era

12) Which period was called "Age of fishes"?
a) Permian b) Triassic
c) **Devonian** d) Ordovician

13) Modern man belongs to which period?
a) **Quaternary** b) Cretaceous
c) Silurian d) Cambrian

14) The Neanderthal man had the brain capacity of
a) 650 – 800cc b) 1200cc
c) 900cc d) **1400cc**

7. HUMAN HEALTH AND DISEASES

I. Choose the correct answer

1. A 30 year old woman has bleedy diarrhoea for the past 14 hours, which one of the following organisms is likely to cause this illness?
   a) *Streptococcus pyogens* b) *Clostridium difficile*
   c) ***Shigella dysenteriae*** d) *Salmonella enteritidis*
2. Exo-erythrocytic schizogony of Plasmodium takes place in -------
   a) RBC b) Leucocytes
   c) Stomach d) **Liver**
3. The sporozoites of *Plasmodium vivax* are formed from ----------
   a) Gametocytes b) Sporoblasts
   c) **Oocysts** d) Spores
4. Amphetamines are stimulants of the CNS, whereas barbiturates are ----
   a) CNS stimulant b) both a and b
   c) hallucinogenic d) **CNS depressants**
5. Choose the correctly match pair.
   a) **Amphetamines - Stimulant**
   b) LSD - Narcotic
   c) Heroin - Psychotropic
   d) Benzodiazepine - Pain killer
6. The Athlete's foot disease in human is caused by-------
   a) Bacteria b) **Fungi**
   c) Virus d) Protozoan
7. Cirrhosis of liver is caused by chronic intake of ------
   a) Opium b) **Alcohol**
   c) Tobacco d) Cocaine
8. The sporozoite of the malarial parasite is present in ----
   a) **saliva of infected female Anopheles mosquito.**
   b) RBC of human suffering from malaria.
   c) Spleen of infected humans.
   d) Gut of female Anopheles mosquito.
9. Paratope is an
   a) Antibody binding site on variable regions
   b) Antibody binding site on heavy regions
   c) **Antigen binding site on variable regions**
   d) Antigen binding site on heavy regions
10. Allergy involves
    a) **IgE** b) IgG
    c) lgA d) IgM
11. Spread of cancerous cells to distant sites is termed as
    a) **Metastasis** b) Oncogenes
    c) Proto-oncogenes d) Malignant neoplasm
12. AIDS virus has

a) **Single stranded RNA** b) Double stranded RNA
c) Single stranded DNA d) Double stranded DNA

13. B cells that produce and release large amounts of antibody are called
a) Memory cells b) Basophils
c) **Plasma cells** d) killer cells

8.MICROBES IN HUMAN WELFARE

I. Choose the correct answer

1. Which of the following microorganism is used for production of citric acid in industries?
a) *Lactobacillus bulgaris* b) *Penicillium citrinum*
c) ***Aspergillus niger*** d) *Rhizopus nigricans*
2. Which of the following pair is correctly matched for the product produced by them?
a) *Acetobacter aceti* - Antibiotics
b) *Methanobacterium* - Lactic acid
c) *Penicilium notatum* - Acetic acid
d) ***Saccharomyces cerevisiae*** **- Ethanol**
3. The most common substrate used in distilleries for the production of ethanol is_____
a) Soyameal b) Groundgram
c) **Molasses** d) Corn meal
4. Cry toxins obtained from *Bacillus thuringiensis* are effective against for_____
a) Mosquitoes b) Flies
c) Nematodes d) **Bollworms**
5. Cyclosporin – A is an immunosuppressive drug produced from _____
a) *Aspergillus niger* b) *Manascus purpureus*
c) *Penicillium notatum* d) ***Trichoderma polysporum***
6. Which of the following bacteria is used extensively as a bio-pesticide?
a) ***Bacillus thurigiensis*** b) *Bacillus subtilis*
c) *Lactobacillus acidophilus* d) *Streptococcus lactis*
7. Which of the following is not involved in nitrogen fixation?
a) **Pseudomonas** b) Azotobacter
c) Anabaena d) Nostac
8. CO_2 is not released during
a) Alcoholic fermentation b) **Lactate fermentation**
c) Aerobic respiration in animals d) Aerobic respiration in plants
9. The purpose of biological treatment of waste water is to _____
a) **Reduce BOD** b) Increase BOD
c) Reduce sedimentation d) Increase sedimentation
10. The gases produced in anaerobic sludge digesters are
a) Methane, oxygen and hydrogen sulphide.
b) Hydrogen sulphide, methane and sulphur dioxide.
c) Hydrogen sulphide, nitrogen and methane.
d) **Methane, hydrogen sulphide and CO_2.**

9. APPLICATIONS OF BIOTECHNOLOGY

I. Choose the correct answer

1. The first clinical gene therapy was done for the treatment of
   a) AIDS
   b) Cancer
   c) **Cystic fibrosis**
   d) SCID
2. Dolly, the sheep was obtained by a technique known as
   a) Cloning by gene transfer
   b) Cloning without the help of gametes
   c) Cloning by tissue culture of somatic cells
   d) **Cloning by nuclear transfer.**
3. The genetic defect adenosine deaminase deficiency may be cured permanently by
   a) **Enzyme replacement therapy**
   b) periodic infusion of genetically engineered lymphocytes having ADA cDNA
   c) administering adenosine deaminase activators
   d) introducing bone marrow cells producing ADA into embryo at an early stage of development.
4. How many amino acids are arranged in the two chains of Insulin?
   a) Chain A has 12 and Chain B has 13
   b) **Chain A has 21 and Chain B has 30 amino acids**
   c) Chain A has 20 and chain B has 30 amino acids
   d) Chain A has 12 and chain B has 20 amino acids.
5. PCR proceeds in three distinct steps governed by temperature, they are in order of
   a) **Denaturation, Annealing, Synthesis**
   b) Synthesis, Annealing, Denaturation
   c) Annealing, Synthesis, Denaturation
   d) Denaturation, Synthesis, Annealing
6. Which one of the following statements is true regarding DNA polymerase used in PCR?
   a) It is used to ligate introduced DNA in recipient cells
   b) It serves as a selectable marker
   c) It is isolated from a Virus
   d) **It remains active at a high temperature.**
7. ELISA is mainly used for
   a) Detection of mutations
   b) **Detection of pathogens**
   c) Selecting animals having desired traits
   d) Selecting plants having desired traits
8. Transgenic animals are those which have
   a) Foreign DNA in some of their cells
   b) **Foreign DNA in all their cells**
   c) Foreign RNA in some of their cells
   d) Foreign RNA in all their cells
9. Recombinant Factor VIII is produced in the ------- cells of the Chinese Hamster
   a) Liver cells
   b) blood cells
   c) **ovarian cells**
   d) brain cells.
10. Vaccines that use components of a pathogenic organism rather than the whole organism are called
    a) **Subunit recombinant vaccines**
    b) attenuated recombinant vaccines
    c) DNA vaccines
    d) conventional vaccines.

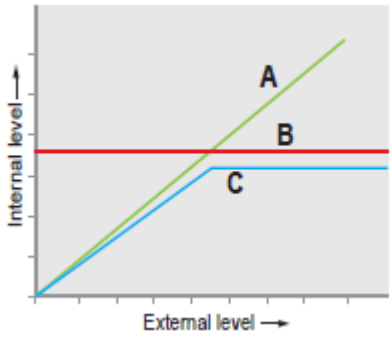
10. ORGANISMS AND POPULATION

I. Choose the Correct Answer

1. All populations in a given physical area are defined as
   a) **Biome** b) Ecosystem
   c) Territory d) Biotic factors
2. Organisms which can survive a wide range of temperatuer are called
   a) Ectotherms b) **Eurytherms**
   c) Endotherms d) Stenotherms
3. The interaction in nature, where one gets benefit on the expense of other is...
   a) Predation b) Mutualism
   c) Amensalism d) **Commensalism**
4. Predation and parasitism are which type of interactions?
   a) (+,+) b) (+, O)
   c) (-, -) d) **(+, -)**
5. Competition between species leads to
   a) **Extinction** b) Mutation
   c) Amensalism d) Symbiosis
6. Which of the following is an r-species
   a) Human b) **Insects**
   c) Rhinoceros d) Whale
7. Match the following and choose the correct combination from the options given below.

Column I	Column II
A. Mutalism	1. Lion and deer
B. Commensalism	2. Round worm and man
C. Parasitism	3. Birds compete with squirrels for nuts
D. Competition	4. Sea anemone on hermit crab
E. Predation	5. Bernacles attached to Whales.
Dispersal	

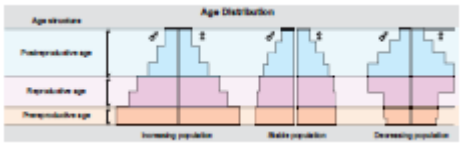
   a) **A- 4, B-5, C-2, D –3, E-1** b) A- 3, B-1, C-4, D – 2, E-5
   c) A- 2, B-3, C-1, D – 5, E-4 d) A- 5, B-4, C-2, D – 3, E-1
8. The figure given below is a diagrammatic representation of response of organisms to abiotic factors. What do A, B and C represent respectively.



S.No.	A	B	C
a.	**Conformer**	**Regulator**	**Partial Regulator**

b.	Regulator	Partial Regulator	Conformer
c.	Partial Regulator	Regulator	Conformer
d.	Regulator	Conformer	Partial Regulator

9. The relationship between sucker fish and shark is.....
   a) Competition b) **Commensalism**
   c) Predation d) Parasitism.
10. What type of human population is represented by the following age pyramid?



   a) Vanishing population b) **Stable population**
   c) Declining population d) Expanding population
11. Which of the following is correct for r-selected species
   a) **Large number of progeny with small size**
   b) large number of progeny with large size
   c) small number of progeny with small size
   d) small number of progeny with large size
12. Animals that can move from fresh water to sea called as.....
   a) Stenothermal b) Eurythermal
   c) **Catadromous** d) Anadromous
13. Some organisms are able to maintain homeostasis by physical means ...
   a) Conform b) **Regulate**
   c) Migrate d) Suspend.

11.BIODIVERSITY AND ITS CONSERVATION

I. Choose the correct answer

1. Which of the following region has maximum biodiversity
   a) Taiga b) **Tropical forest**
   c) Temperate rain forest d)Mangroves
2. Conservation of biodiversity within their natural habitat is
   a) **Insitu conservation** b) Exsitu conservation
   c) In vivo conservation d) In vitro conservation
3. Which one of the following is not coming under insitu conservation
   a) Sanctuaries b) Natural parks
   c) **Zoological park** d) Biosphere reserve
4. Which of the following is considered a hotspots of biodiversity in India
   a) Western ghats b) Indo-gangetic plain
   c) Eastern Himalayas d) **A and C**
5. The organization which published the red list of species is
   a) WWF b) **IUCN**

c) ZSI d) UNEP

6. Who introduced the term biodiversity?
   a) Edward Wilson b) **Walter Rosen**
   c) Norman Myers d) Alice Norman
7. Which of the following forests is known as the lungs of the planet earth?
   a) Tundra forest b) **Rain forest of north east India**
   c) Taiga forest d) Amazon rain forest
8. Which one of the following are at high risk extinction due to habitat destruction
   a) Mammals b) Birds
   c) **Amphibians** d) Echinoderms
9. Assertion: The Environmental conditions of the tropics are favourable for speciation and diversity of organisms.

Reason: The climate seasons, temperature, humidity and photoperiod are more or less stable and congenial.

   a) **Both Assertion and Reason are true and Reason explains Assertion correctly.**
   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.

12.ENVIRONMENTAL ISSUES

I. Choose the correct answer:

1. Right to Clean Water is a fundamental right, under the Indian Constitution
   a) Article 12 b) **Article 21**
   c) Article 31 d) Article 41
2. With which of the following, the Agenda 21' of Rio Summit, 1992 is related to?
   a) **Sustainable development**
   b) Combating the consequences of population
   c) Mitigation norms of Green House Gases (GHGs) emission.
   d) Technology transfer mechanism to developing countries for 'clean-energy' production.
3. Which among the following awards instituted by the Government of India for individuals or communities from rural areas that have shown extraordinary courage and dedication in protecting Wildlife?
   a) Indira Gandhi Paryavaran Puraskar b) Medini Puruskar Yojana
   c) **Amrita Devi Bishnoi Award** d) Pitambar Pant National Award
4. The 'thickness' of Stratospheric Ozone layer is measured in/on:
   a) Sieverts units b) **Dobson units**
   c) Melson units d) Beaufort Scale
5. Which among the following is the most abundant Green-House-Gas (GHG) in the earth's atmosphere?
   a) Carbon dioxide b) **Water Vapour**
   c) Sulphur Dioxide d) Tropospheric Ozone
6. As per 2017 statistics, the highest per capita emitter of Carbon dioxide in the world is
   a) USA b) **China**

c) Qatar
d) Saudi Arabia

7. The use of microorganism metabolism to remove pollutants such as oil spills in the water bodies is known as
   a) Biomagnification
   b) **Bioremediation**
   c) Biomethanation
   d) Bioreduction

8. The Ozone Day is observed every year on September 16 as on this day in 1987 the _____was signed for launching efforts to arrest the depletion of the fragile ozone layer in the stratosphere that prevents the harmful ultra-violet rays of the sun from reaching the earth. Fill the correct word in blank.
   a) **Montreal Protocol**
   b) Geneva Protocol
   c) Kyoto Protocol
   d)Nagoya Protocol

9. Which among the following always decreases in a Food chain across tropic levels?
   a) Number
   b) Accumulated chemicals
   c) **Energy**
   d) Force

10. In the E-waste generated by the Mobile Phones, which among the following metal is most abundant?
   a) **Copper**
   b) Silver
   c) Palladium
   d) Gold

11. The Hydrochlorofluorocarbons (HCFCs) are the compounds which have the following molecules:
   a) Hydrogen
   b) Carbon
   c) **Chlorine**
   d) Fluorine

12. SMOG is derived from :
   a) Smoke
   b) Fog
   c) **Both A and B**
   d) Only A

13. Excess of fluoride in drinking water causes:
   a) Lung disease
   b) Intestinal infection
   c) **Fluorosis**
   d) None of the above