Target Test Series for NEET-2021

Time: 3 Hr.   **FULL TEST NO. : 02**   **Max mark: 720**

INSTRUCTIONS :

☞   There are three sections in this paper, consisting Physics, Chemistry, & Biology.

☞   For each correct answer 4 marks awarded and for each incorrect answer, one mark will be deducted.

☞   Mark only one correct answer out of four alternatives.

☞   Use Blue/Black Ball Point Pen only for writing particulars/marking.

☞   Use of Calculator is not allowed.

☞   Dark the circle in the space provided only.

☞   Use of white fluid or any other material which damage the answer sheet, is not permissible on the Answer Sheet.

USEFUL CONSTANTS

|			
Boltzmann constant (k)	$= 1.38 \times 10^{-23}$ J K^{-1}	Avogadro's number (N_A)	$= 6.02 \times 10^{23}$ mol^{-1}
Planck's constant (h)	$= 6.63 \times 10^{-34}$ J s	Speed of light in vacuum (c)	$= 3 \times 10^{8}$ m s^{-1}
Rest mass of electron (m_e)	$= 9.1 \times 10^{-31}$ kg	1 unified atomic mass unit (u)	$= 1.66 \times 10^{-27}$ kg
1 eV	$= 1.6 \times 10^{-19}$ J	1 nm	$= 10^{-9}$ m
Charge of Electron (e)	$= 1.6 \times 10^{-19}$ C	Gas constant (R)	$= 8.31$ J mol^{-1} K^{-1}

TOPICS :

PHYSICS   : COMPLETE SYLLABUS

CHEMISTRY : COMPLETE SYLLABUS
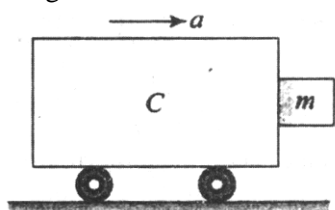
BIOLOGY   : COMPLETE SYLLABUS.

PHYSICS

1. Block B moves to the right with a constant velocity v_0. The velocity of body A relation to B is :
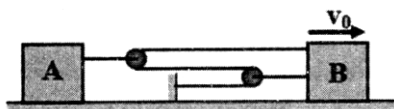
(1) $v_0/2$, towards left   (2) $v_0/2$, towards right

(3) $3v_0/2$, towards left   (4) $3v_0/2$, towards right

2. A block of mass m is in contact with the cart C as shown in the figure

The coefficient of static friction between the block and the cart is p. The acceleration of the cart will prevent the block from falling satisfies

(1) $a > \dfrac{mg}{\mu}$ (2) $a > \dfrac{g}{\mu m}$

(3) $a \geq \dfrac{g}{\mu}$ (4) $a < \dfrac{g}{\mu}$

3. A syatem consists of three masses m_1, m_2 and m_3, connceted by a string passing over a pulley P. The mass m_1, hangs freely and m_2 and m_3 are on a rough horizontal table (the coefficient of friction $= \mu$)

The pulley is frictionless and of negligible mass. The downward acceleration of mass m_1 is

(Assume $m_1 = m_2 = m_3 = m$)
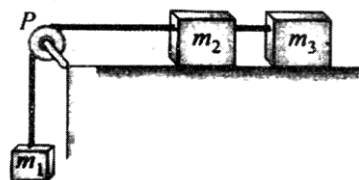
(1) $\dfrac{g(1-g\mu)}{9}$ (2) $\dfrac{2g\mu}{3}$

(3) $\dfrac{g(1-2\mu)}{3}$ (4) $\dfrac{g(1-2\mu)}{2}$

4. Three blocks A, B and C of masses 4kg 2 kg and 1 kg respectively are in contact on a frictionless surface, as shown. If a force of 14 N is applied on the 4kg block, then the contact force between A and B is
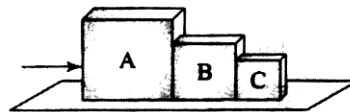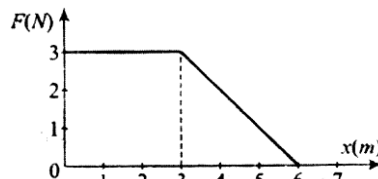

(1) 2N   (2) 6N

(3) 8N   (4) 18 N

5. A mass of 0.5 kg moving with a speed of 1.5 ms^{-1} on a horizontal smooth surface collides with a nearly weightless spring of force constant k = 50 N/m. The maximum compression of the spring would be :
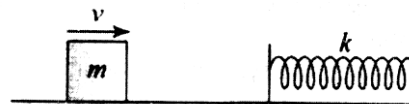

(1) 0.15 m   (2) 0.12 m

(3) 1.5 m   (4) 0.5 m

6. A foce F acting on an object varies with distance x as shown here. The work the force in moving the object from x = 0 to x = 6m is

(1) 4.5 J   (2) 13.5 J

(3) 9.0 J   (4) 18.0 J

7. A 0.5 kg ball moving with a speed of 12 m/s strikes a hard wall at an angle of 30° with the wall. It is reflected with the same speed and at the same angle. If the ball is in contact with the wall for 0.25 s, the average force acting on the wall is
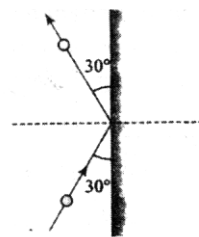

(1) 48 N   (2) 24 N

(3) 12 N   (4) 96 N

8. A small object of uniform density rolls up a curved surface with an initial velocity v. It reaches up to a maximum height of $\dfrac{3v^2}{4g}$ to the initial position. The object is

(1) Ring   (2) Solid sphere

(3) Hollow sphere   (4) Disc

9. A mass m moves in a circle on a smooth horizontal plane with velocity v_0 at a radius R_0. The mass is attached to a string which passes through a smooth hole in the plane as shown.
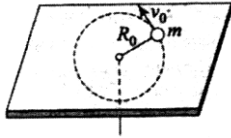
The tension in the string is increased gradually and finally m moves in a circle of radius $\dfrac{R_0}{2}$. The final value of the kinetic energy is

(1) mv_0^2 (2) $\dfrac{1}{4}mv_0^2$

(3) $2mv_0^2$ (4) $\dfrac{1}{2}mv_0^2$

10. Three identical spherical shells, each of mass m and radius r are placed as shown in the figure. Consider an axis XX which is touching to two shells and passing through diameter to third shell. Moment of inertia of the system considering of these three spherical shells about X C axis is
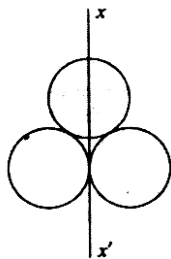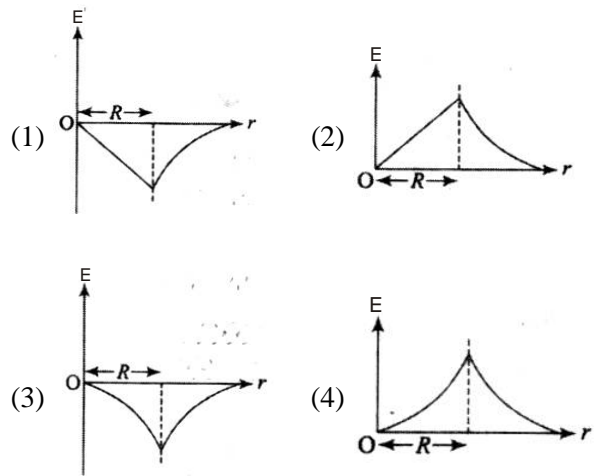

(1) $\dfrac{11}{5}mr^2$ (2) $\dfrac{16}{5}mr^2$

(3) $3mr^2$ (4) $4mr^2$

11. A particle of mass M is situated at the centre of a spherical shell of same mass and radius a. The gravitational potential at a point situated at a/2 distance from the centre will be :

(1) $-\dfrac{3GM}{a}$ (2) $-\dfrac{2GM}{a}$

(3) $-\dfrac{GM}{a}$ (4) $-\dfrac{4GM}{a}$

12. Dependance of intensity of gravitational field (E) of earth with distance (r) from centre of earth is correctly represented by


13. A jar is filled with two non–mixing liquids 1 and 2 having densities ρ_1 and ρ_2, respectively A solid ball, made of a material of density ρ_3, is dropped in the jar. It comes to equilibrium in the position shown in the figure. Which of the following is true for ρ_1, ρ_2 & ρ_3?
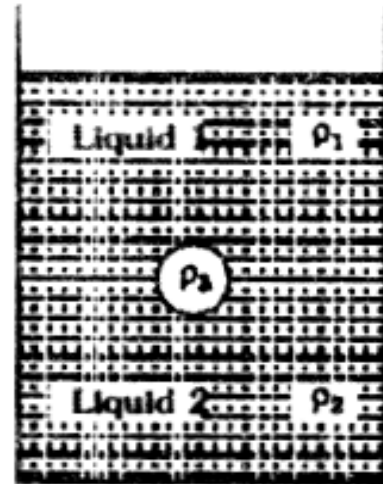
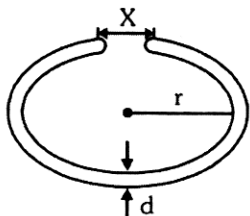(1) $\rho_3 < \rho_1 < \rho_2$ (2) $\rho_1 > \rho_3 > \rho_2$

(3) $\rho_1 < \rho_2 < \rho_3$ (4) $\rho_1 < \rho_3 < \rho_2$

14. In a U–tube experiment, a column AB of water is balanced by a column 'CD' of oil, as shown in the figure. Then the relative density of oil is :
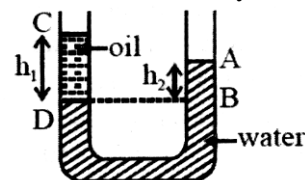

(1) $\dfrac{h_2}{h_1}$ (2) $\dfrac{h_1}{h_2}$

(3) $\dfrac{(h_1 - h_2)}{h_1}$ (4) $\dfrac{h_2}{(h_1 + h_2)}$

15. A cylindrical metal rod of length L is shaped into a ring with a small gap as shown. On heating the system

(1) x decreases, r and d increases
(2) x and r increases, d decreases
(3) x, r and d all increase
(4) Data insufficient to arrive at a conclusion

16. Steam at 100°C is passed into 20 g of water at 10°C. When water acquires a temperature of 80°C, the mass of water present will be [Take specific heat of water = 1 cal g^{-1} °C^{-1} and latent heat of steam = 540 cal g^{-1}]
(1) 24 g
(2) 31.5 g
(3) 42.5 g
(4) 22.5 g

17. Certain quantity of water cools from 70°C to 60°C in the first 5 minutes and to 54°C in the next 5 minutes. The temperature of the surroundings is
(1) 45°C
(2) 20°C
(3) 42°C
(4) 10°C

18. A thermodynamic system is taken through the cycle ABCD as shown in the figure. Heat rejected by the gas during the cycle is
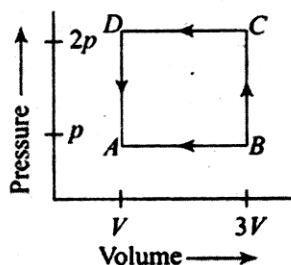

(1) PV
(2) 2PV
(3) 4PV
(4) ½ PV

19. A gas is taken through the cycle $A \rightarrow B \rightarrow C \rightarrow A$, as shown. What is the net work done by the gas ?
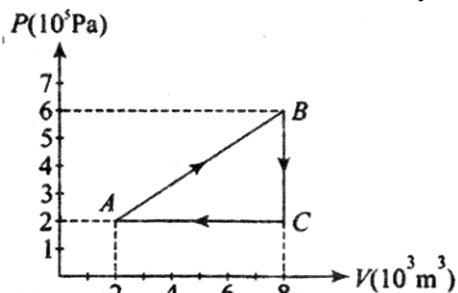

(1) 2000 J
(2) 12×10^8 J
(3) Zero
(4) – 2000 J

20. A pendulum has time period T for small oscillations. An obstacle is placed directly beneath the pivot, so that only the lowest one quarter of the string can follow the pendulum bob when it swings in the left of its resting position as shon in the figure. The pendulum is released from rest at a certain point A. The time taken by it to return to that point is
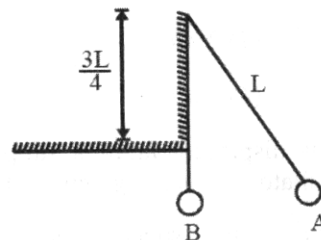
(1) T
(2) T/2
(3) 3T/4
(4) T/4

21. Two masses m_1 and m_2 are suspended together by a massless spring of constant k. When the masses are in equilibrium, m1 is removed without distrubing the system ; the amplitude of vibration is :
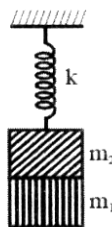
(1) $m_1 g / k$
(2) $m_2 g / k$
(3) $\dfrac{(m_1 + m_2)g}{k}$
(4) $\dfrac{(m_2 - m_1)g}{k}$

22. A car is moving towards a high cliff. The car driver sounds a horn of frequency f. The reflected sound heard by the driver has a frequency 2f. If v be the velocity of sound, then the velocity of the car, in the same velocity units. will be :
(1) $\dfrac{v}{\sqrt{2}}$
(2) $\dfrac{v}{3}$
(3) $\dfrac{v}{4}$
(4) $\dfrac{v}{2}$

23. Two pith balls carrying equal charges are suspended from a common point by strings of equal length, the equilibrium separation between them is r. Now the strings are 7rigidly clamped at half the height. The equilibrium separation between the balls now becomes
(1) $\left(\dfrac{1}{\sqrt{2}}\right)^2$
(2) $\left(\dfrac{r}{\sqrt[3]{2}}\right)$
(3) $\left(\dfrac{2r}{\sqrt{3}}\right)$
(4) $\left(\dfrac{2r}{3}\right)$

24. Three point charges $+q$, $-2q$ and $+q$ are placed at points $(x=0, y=a, z=0)$, $(x=0, y=0, z=0)$ and $(X=a, y=0, z=0)$, respectively. The magnitude and direction of the electric dipole moment vector of this charge assembly are

(1) $\sqrt{2}$ qa along +ve direction

(2) $\sqrt{2}$ qa along the line joining points
$(x = 0, y = 0, z=0)$ and $(x = a, y = a, z=0)$

(3) qa along the line joining points $(x=0, y=0, z=0)$ and $(x = a, y = a, z = 0)$

(4) $\sqrt{2}$ qa along +x direction

25. Four metallic plates each with surface area of one side A, are placed at a distance d from each other. The plates are connected as shown in the adjoining figure. Then the capacitance of the system between a and b is :
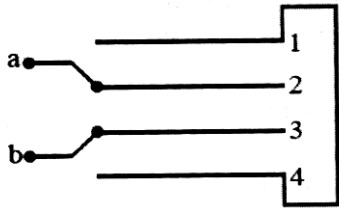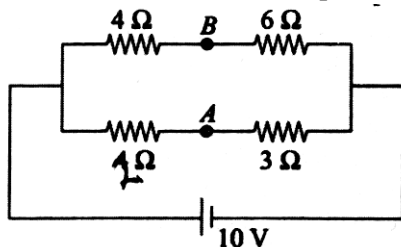

(1) $\dfrac{\varepsilon_0 A}{3d}$

(2) $\dfrac{3\varepsilon_0 A}{d}$

(3) $\dfrac{2\varepsilon_0 A}{d}$

(4) $\dfrac{3\varepsilon_0 A}{2d}$

26. All the bulbs below are identical. Which bulb lights most brightly ?
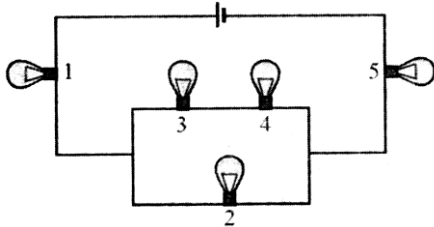
(1) 1 only   (2) 2 only

(3) 3 and 4   (4) 1 and 5

27. The potential difference between points A and B is
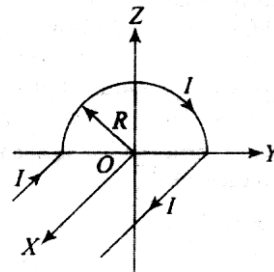

(1) $\dfrac{20}{7}$ V

(2) $\dfrac{40}{7}$ V

(3) $\dfrac{10}{7}$ V

(4) 0

28. When a proton is released from rest in a room, it starts with an initial acceleration a_0 towards west. When it is projected towards north with a speed v0 it moves with an initial acceleration $3a_0$ towards west. The electric and magnetic field in the room are

(1) $\dfrac{ma_0}{e}$ west, $\dfrac{2ma}{ev_0}$ up

(2) $\dfrac{ma_0}{e}$ west, $\dfrac{2ma_0}{ev_0}$ down

(3) $\dfrac{ma_0}{e}$ east, $\dfrac{3ma_0}{ev_0}$ up (4) $\dfrac{ma_0}{e}$ east, $\dfrac{3ma_0}{ev_0}$ down

29. A wire carrying current I has the shape as shown in the adjoining figure. Linear parts of the wire are very long and parallel to X–axis while semicircular portion of radius R is lying in Y–Z plane. Magnetic field at point O is

(1) $\vec{B} = \dfrac{\mu_0}{4\pi}\dfrac{I}{R}\left(\pi\hat{i} + 2\hat{k}\right)$

(2) $\vec{B} = -\dfrac{\mu_0}{4\pi}\dfrac{I}{R}\left(\pi\hat{i} - 2\hat{k}\right)$

(3) $\vec{B} = -\dfrac{\mu_0}{4\pi}\dfrac{I}{R}\left(\pi\hat{i} + 2\hat{k}\right)$

(4) $\vec{B} = \dfrac{\mu_0}{4\pi}\dfrac{I}{R}\left(\pi\hat{i} - 2\hat{k}\right)$

30. A polaroid is placed at 45° to an incoming linearly polarised light of intensity I_0. Now the intensity of light passing through the polaroid after polarisation would be

(1) I_0 (2) $I_0/2$

(3) $I_0/4$ (4) zero

31. In the fig. each resistance = r, fidn R_{PQ}.
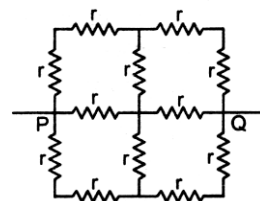
(1) 2r/3   (2) 2r

(3) r   (4) $\dfrac{3}{2}r$

32. The figure shows an infinitely long wire having infinite bends through which 7A current is flowing. The radii of the successive curved portions are r, 2r, 4r, 8r.... ∞, where r = 1.1 m. Find magnetic flux density at O.

(1) $\dfrac{4}{9}\times 10^{-6}$ tesla ourward

(2) $\dfrac{5}{9}\times 10^{-6}$ tesla ourward

(3) $\dfrac{3}{9}\times 10^{-6}$ tesla ourward

(4) $\dfrac{2}{9}\times 10^{-6}$ tesla ourward
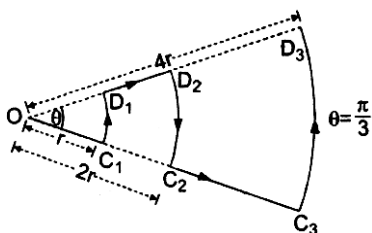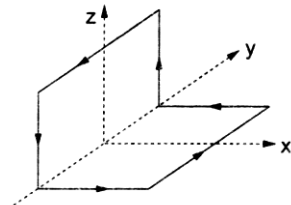
33. A non–planar loop of conducting wire carrying a current i is placed as shown in the figure. Each of the straight sections of the loop is of length 2a. The magnetic field due to this loop at the point P (a,0,a) in the direction is

(1) $\dfrac{1}{\sqrt{2}}(-\hat{j}+\hat{k})$ (2) $\dfrac{1}{\sqrt{3}}(-\hat{j}+\hat{k}+\hat{i})$

(3) $\dfrac{1}{\sqrt{3}}(\hat{i}+\hat{j}+\hat{k})$ (4) $\dfrac{1}{\sqrt{2}}(\hat{i}+\hat{k})$

34. A conducting rod PQ of length 50 cm and mass 100 gm can slide along a pair of vertical smooth conducting rails, connected by a resistance of 10Ω. A uniform magnetic field of 2 T acts perpendicular to the plane of the rails and rod and is directed outwards. Find the constant velocity of fall of the rod

(1) 10ms^{-1} (2) 20ms^{-1}

(3) 30ms^{-1} (4) 40ms^{-1}

35. A rectangular coil of metallic wire is placed in a uniform field of 40 mT its plane perpendicular to the field. If area of the loop is decreasing at a constant rate of 0.4 m²/sec., calculate the induced emf in the coil.

(1) 16 mV   (2) 15 mV

(3) 12 mV   (4) 17 mV

36. A conducting rod of length 2l is rotating with constant angular speed ω about its perpendicular bisector. A uniform magnetic filed B exists parallel to the axis of rotation, the emf induced between two ends of the rod is :
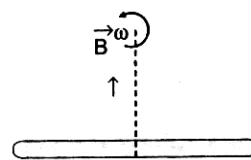
(1) $B\omega l^2$ (2) $\dfrac{1}{2}B\omega l^2$

(3) $\dfrac{1}{8}B\omega l^2$ (4) zero

37. Find the rms value of potential difference shown in figure.
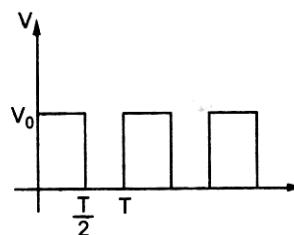
(1) $V_{rms}=\dfrac{V_0}{\sqrt{2}}$ (2) $V_{rms}=\dfrac{V_0}{\sqrt{3}}$

(3) $V_{rms}=\dfrac{V_0}{\sqrt{4}}$ (4) $V_{rms}=\dfrac{V_0}{\sqrt{5}}$

38. In the circuit shown, $X_L = 60\ \Omega$, $X_C = 60\Omega$ and R = 40Ω. Then find the potential difference between the points P and Q.
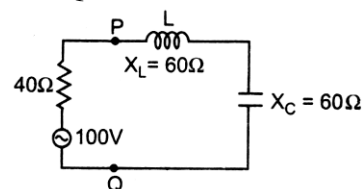
(1) $V_{PQ}=0$ (2) $V_{PQ}=1$

(3) $V_{PQ}=2$ (4) $V_{PQ}=3$

39. A container is filled with water ($\mu = 1.33$) upto a height of 33.25 cm. A concave mirror is placed 15 cm above the water level and the image of an object placed at the bottom is formed 25 cm below the water level. The focal length of the mirror is

Mirror

15 cm

33.25 cm, $\mu = 1.33$, 25 cm

(1) 10 cm (2) 15 cm
(3) –18.3 cm (4) 25 cm

40. Calculate the binding energy per nucleon of $_6C^{12}$ nucleus. Given mass of proton $m_p = 1.0078$ u, $m_n = 1.0087$ u, mass of $_6C^{12} = 12.000$ u and 1 u = 931.4 MeV.
(1) 7.68 MeV (2) 7.66 MeV
(3) 6.76 MeV (4) 6.76 MeV

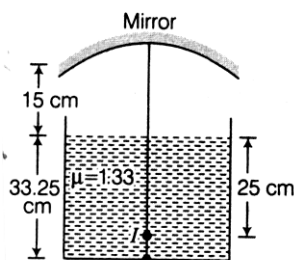41. The wavelength of first Balmer line for $_1H^1$, $_1H^2$ and $_2He^4$ are λ_p, λ_D and λ_α respectively. The correct option/s is /are
(1) $\lambda_D < \lambda_p$ (2) $\lambda_\alpha < \lambda_D$
(3) $\lambda_p < \lambda_D$ (4) $\lambda_p < \lambda_D < \lambda_\alpha$

42. An X-ray tube operates at 10kV. Find teh ratio of minimum X-ray wavelength to that of de Brogllie wavelength of the electron.
(1) 10.2 (2) 10.1
(3) 10.3 (4) 10.4

43. The binding energy per nucleon of deutron $_1H^2$ and helium nucleus ($_2He^4$) is 1.1 MeV and 7 MeV respectively. If two deutrons nuclei react to form a single helium nucleus, then the energy released is :
(1) 13.9 MeV (2) 26.9 MeV
(3) 23.6 MeV (4) 19.2 MeV

44. The forward biased diode in the following circuit is
(1) –2V ⊳⊢ ⟶ww⟶ +2V
(2) –5V ⊳⊢ ⟶ww⟶ –3V
(3) 4V ⊳⊢ ⟶ww⟶ 5V
(4) 0V ⊳⊢ ⟶ww⟶ –3V

45. The Boolean algebra for the logic circuit given in the fig. below is

(1) $\overline{A + \overline{B} \cdot C}$ (2) $\vec{A} \cdot \vec{B} + \vec{C}$
(3) $\vec{A} + \overline{B \cdot C}$ (4) $\overline{A + \overline{B} \cdot C}$

CHEMISTRY

46. Which of the following is not permissible arrangement of electrons in an atom

(1) $n = 3$; $l = 2$; $m = -2$; $s = -\dfrac{1}{2}$

(2) $n = 4$; $l = 0$; $m = 0$; $s = -\dfrac{1}{2}$

(3) $n = 5$; $l = 3$; $m = 0$; $s = +\dfrac{1}{2}$

(4) $n = 3$; $l = 2$; $m = -3$; $s = -\dfrac{1}{2}$

47. The radiation of low frequency will be emitted in which transition of hydrogen atom
(1) n = 1 to n = 4 (2) n = 2 to n = 5
(3) n = 3 to n = 1 (4) n = 5 to n = 2

48. In which of the following non-planar molecuels dz^2 orbital is involved in hybridization.
(1) XeF_4 (2) SF_4
(3) XeO_3 (4) XeF_5^-

49. Select the incorrect order :
(1) $BF_3 < BF_4^-$ B – F bond length
(2) $BF_3 > BF_3$. NH_3 B–F bond energy
(3) $BF_3 < BF_3$. NH_3 % S character on boron atom
(4) $N(SiH_{3.3} > N(CH3.3$ % S character on central atom 'N'

50. Which of the following statement are not correct ?
(1) All C–O bonds in CO_3^{2-} are equal but not in H_2CO_3.
(2) All C–O bonds in HCO_2^- are equal but not in HCO_2H

(3) C – O bond length in HCO_2^- is smaller than C–O bond length in CO_3^{-2}

(4) C–O bond length in HCO_2^- and C–O bond length in CO_3^{-2} are equal

51. The incorrect order of the O–O bond length in O_2, H_2O_2 and O_3 is
(1) $O_2 > O_3 > H_2O_2$ (2) $O_3 > H_2O_2 > O_2$
(3) $O_2 > H_2O_2 > O_3$ (4) $H_2O_2 > O_3 > O_2$

52. For reaction
$2NOCl(g) \rightleftharpoons 2NO(g) + Cl_2(g), K_c$ at 427°C is $3 \times 10^{-6} L^{-1}$ mol. The value of K_P is nearly :-
(1) 7.50×10^{-5} (2) 2.50×10^{-5}
(3) 2.50×10^{-4} (4) 1.75×10^{-4}

53. For the reaction $CO_{(g)} + H_2O_{(g)} \rightleftharpoons CO_{2(g)} + H_{2(g)}$ temperature, the equilibrium amount of $CO_{2(g)}$ can be increased by
(1) Adding a suitable catalyst
(2) Additing an inert gas
(3) Decreasing the volume of container
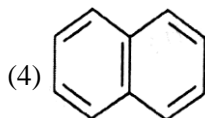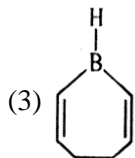(4) Increasing the amount of CO(g)

54. Photochemical smog is related to the pollution of
(1) Soil   (2) Water
(3) Noise   (4) Air

55. The cause of water pollution in due to :
(1) Micro–organisms   (2) Organic wastes
(3) Pesticide   (4) All of these

56. Which is aromatic among the following ?

(1)   (2)

(3)   (4)
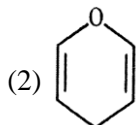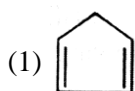
57. In which of the following resonance does not take place ?

(1)   (2)

(3)   (4)

58.
$$CH_3 - \underset{\underset{CH_3}{|}}{C} = CH - CH_3 \xrightarrow[KMnO_4/\Delta]{NalO_4}$$
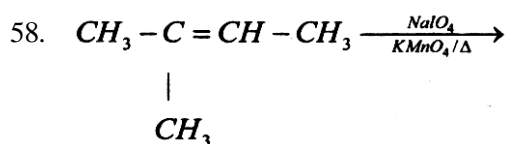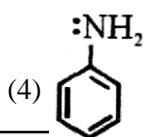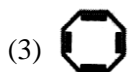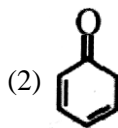
Product will be
(1) $CH_3 -COOH + CH_3-CH_2-COOH$
(2) $CH_3 - CHO + CH_3-CH_2-COOH$
(3) $CH_3 - CHO + CH_3 - \underset{\overset{||}{O}}{C} - CH_3$
(4) $CH_3 - COOH + CH_3 - \underset{\overset{||}{O}}{C} - CH_3$

59. Incorrect match is

(1) $\xrightarrow[AlCl_3(Anhy)]{CH_3Cl}$ *Friedal craft reaction*

(2) $+HCN + HCl \xrightarrow{Anhy.AlCl_3}$ *Gattermann aldehyde synthesis*

(3) $+CHCl_3 \xrightarrow{Anhy.AlCl_3}$ *Re imer Tiemann reaction*

(4) $CH_3 - Br + AgF \xrightarrow{Water}$ *Finkelstein reaction*
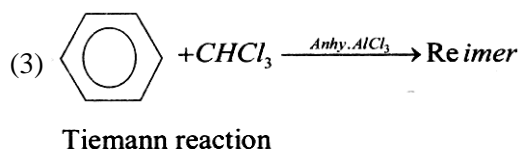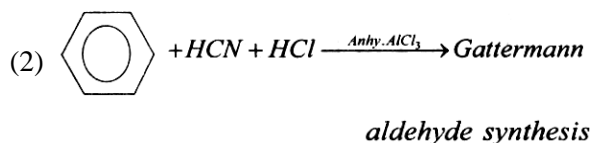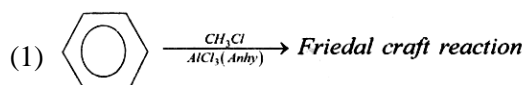
60. The hydride ion H^- is stronger base than its hybroxide ion OH^-. Which of the following reactions will occur if sodium hydride (NaH) is dissolved in water

(1) $2H^-(aq) \rightarrow H_2 + 2e^-$

(2) $H^-(aq) + H_2O(l) \rightarrow OH^- + H_2$

(3) $H^- + H_2O(l) \rightarrow$ No reaction

(4) None of the above

61. When 100 mL of 0.1 M NaCN solution is titrated with 0.1 M HCl solution the variation of pH of solution with volume of HCl added will be :

(1)   (2)

(3) [pH vs Vol of HCl added graph]

(4) [pH vs Vol of HCl added graph]
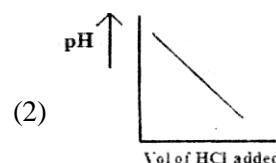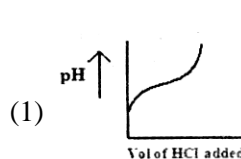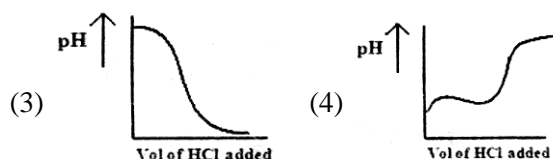
62. Borax is prepared by treating colmenite with
(1) $NaNO_3$
(2) NaCl
(3) Na_2CO_3
(4) $NaHCO_3$

63. Which of the following doesn't exist
(1) BF_6^{3-}
(2) AlF_6^{3-}
(3) SiF_6^{2-}
(4) $GeCl_6^{2-}$

64. Select incorrect statement :
(1) N_2O is less acidic than NO
(2) ZnO and Al_2O_3 can dissolve in acid and base
(3) Valancey w.r.t. oxygen increase down the group
(4) Yb^{+2} ions is diamagnetic

65. Which of the folloiwng is not correctly matched :
(1) $[Xe]\,4f^{14}5d^{10}6s^2 \rightarrow$ Transition element
(2) $[Rn]\,5f^{14}6d^17s^2 \rightarrow$ Inner transition element
(3) $[Xe]\,4f^{14}5d^{10}6s^26p^67s^2 \rightarrow$ Normal element
(4) $[Xe]\,4f^{14}5d^26s^2 \rightarrow$ d–block element

66. Which of the following is correct ?
(1) Number of electron in Penultimate shell of d–block elements are (1–10)
(2) 5th pd contains 10 elements which has one or more than one 5d electrons
(3) Except 'Pd' maximum electrons in outermost shell are 8
(4) Total number of groups in p–block are 6 because p–orbital can accommodate maximum 6 electrons

67. Which of the following statement is wrong
(1) No inert gas is present in 7th period
(2) 3rd period contains 18 elements
(3) 1st period contains two non metals
(4) In p–block, metal, nonmetal and metalloids are present

68. Which of the following sets consists of gases with same rate of diffusion ?
(1) CO_2, NO_2, C_3H_8
(2) CO_2, N_2O, C_3H_8
(3) H_2, D_2, He
(4) N_2, CO_2, C_2H_4

69. $H_2SeO_4 + NaOH \rightarrow NaHSeO_4$; E.W.of
$H_2SeO_4 = E_1$ $H_2SeO_4 + 2NaOH \rightarrow Na_2SeO_4$;
E.W. of $H_2SeO_4 = E_2$ Relation between E_1 and E_2.

(1) $E_1 < E_2$
(2) $E_1 > E_2$
(3) $E_1 = E_2$
(4) $E_1 = \dfrac{E_2}{3}$

70. Consider the following reaction :
$3Br_2 + 6CO_3^{2-} + 3H_2O \rightarrow$
$5Br^- + BrO_3^- + 6HCO_3^-$
Which of the following statement is true regarding this reaction ?
(1) Bromine is oxidized and the carbonate radical is reduced
(2) Bromine is reduced and the carbonate radical is oxidized
(3) Bromine is neither reduced nor oxidized
(4) Bromine is both reduced and oxidized

71. For which of the following reactions ΔH is approximately equal to ΔE ?
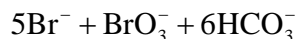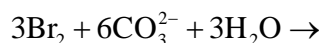(1) $2H_2O_{2(g)} \rightarrow 2H_2O_{(g)} + O_{2(g)}$
(2) $2H_{2(g)} + O_{2(g)} \rightarrow 2H_2O_{(g)}$
(3) $2NH_{3(g)} \rightarrow N_{2(g)} + 3H_{2(g)}$
(4) $2NO_{(g)} \rightarrow N_{2(g)} + O_{2(g)}$

72. During melting of an ice slab at 273 K at 1 atmpressure:
(1) Zero work is done on the ice–water system by the atmosphere
(2) Positive work is done by the ice–water system on the atmosphere
(3) The entropy of the ice–water system decreases
(4) The internal energy of the ice–water system increase

73. Consider two reactions
I. $Zn + $ conc. HNO_3(hot) $\rightarrow Zn(NO_3)_2 + X + H_2O$
II. $Zn + $ dil. HNO_3 (cold) $\rightarrow Zn(NO_3)_2 + Y + H_2O$
Compounds X and Y are respectively :
(1) N_2O, NO
(2) NO_2, N_2O
(3) N_2, N_2O
(4) NO_2, NO

74. In which of the following option product gas X and Y (other than water vapour are same)
(1) $Mg_2C_3 + H_2O \rightarrow X; Al_4C_3 + H_2O \rightarrow Y$
(2) $NH_4NO_3 \xrightarrow{\Delta} X; (NH_4)_2Cr_2O_7 \xrightarrow{\Delta} Y$
(3) $NH_4Cl \xrightarrow{NaOH(aq)} X; NaNO_3 \xrightarrow{All\ NaOH(aq)} Y$
(4) $Cu + $ dil. $HNO_3 \rightarrow X; Ag + $ dil. $HNO_3 \rightarrow Y$

75. SO_2 is a strong reducing agent however it can also act as oxidising agent. Which of the following shows its oxidising nature :

(1) Bleaching action

(2) Decolourising of acidified $KMnO_4$ solution

(3) Reaction with H_2S to give sulphur

(4) Turning acidified dichromate paper green

76. Oxyacid of chloride show similarity in :
(1) Basicity and oxidizing nature
(2) Hybridisation state and Basicity
(3) Shape and bond angle
(4) Number of π bond and acidic nature

77. Which of the following alcohol will yield the corresponding alkyl chloride on reaction with concentrated HCl and $ZnCl_2$ at room temperature:

(1) $CH_3 - CH_2 - CH_2 - OH$

(2) $CH_3 - CH - CH_2 - OH$
            |
          CH_3

(3) $CH_3 - CH_2 - CH - CH_2 - CH_2 - OH$
                 |
               CH_3

(4) $CH_3 - CH_2 - \overset{\displaystyle CH_3}{\underset{\displaystyle CH_3}{\overset{|}{\underset{|}{C}}}} - OH$
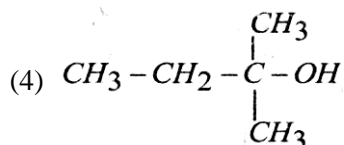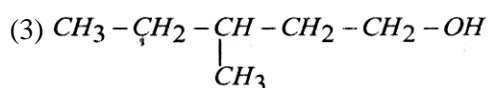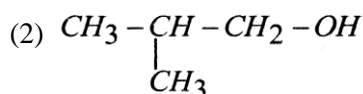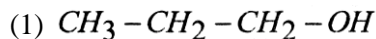
78. Which of the following product is monomeric unit of Bakelite, formed in Lederer–Manase reaction ?

(1)

(2)

(3)

(4)

79. $\xrightarrow[\text{IIg}^{+2}]{\text{dil.}H_2SO_4}$ X $\xrightarrow[\text{(2) }H_2O]{\text{(1) }CH_3MgBr}$ Y , Y is

(1) $\underset{OH}{\overset{Ph}{Ph-\overset{|}{\underset{|}{C}}-Mc}}$

(2) $Ph_3C - OH$

(3) $\underset{Oll}{\overset{Me}{Me-\overset{|}{\underset{|}{C}}-Ph}}$

(4) $Me_3C - OH$.
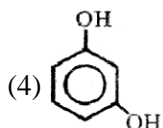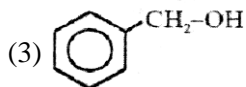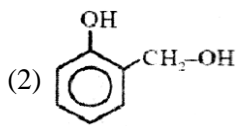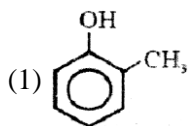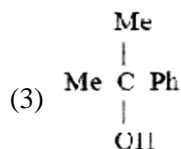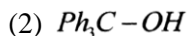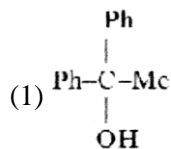
80. What will be the name of the given reaction

81. Arrange the following compound in increasing order of their reactivity in nucleophilic addition reaction :
(P) Benzaldehyde
(Q) p–Methyl benzaldehyde
(R) P-Nitrobenzaldehyde
(S) Acetophenone
(1) P < R < Q < S   (2) S < Q < P < R
(3) P < Q < R < S   (4) Q < P < S < R

82. Which of the following reaction does not give benzaldehyde as product

(1) $+ (HCN + HCl)$ $\xrightarrow[2) H_2O]{(1)ZnCl_2}$

(2) $\xrightarrow[(2)\ H_2O]{(1)\ CrO_2Cl_2}$

(3) $\xrightarrow[(2)\quad H_2O]{(1)\ CrO_3,(CH_3CO)_2O}$

(4) $CHCl_3 \xrightarrow{KOH}$
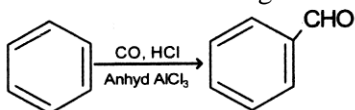
81. (1) Gatterman Koch reaction
(2) Etard reaction
(3) Gattermann reaction
(4) Rosenmund reaction
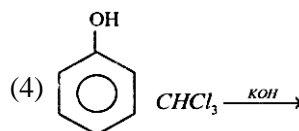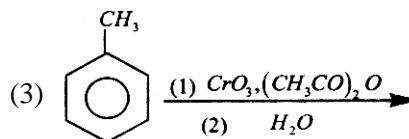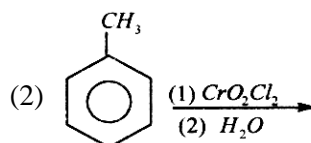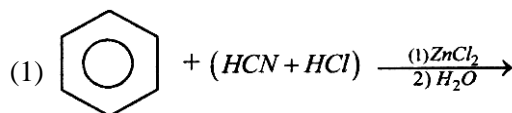
83. Malonic acid $\xrightarrow[P_4O_{10}]{\Delta}$ product ; here product is
(1) Oxalic acid   (2) Carbon suboxide
(3) CO_2 + CO   (4) Acetic acid

84. A person has "bleeding gum" problem. Which of the following vitamin deficiency may be reason for it.
(1) Vitamin C   (2) Vitamin K
(3) Vitamin E   (4) Vitamin D

85. Glucose and fructose are..........of each other
(1) homologus
(2) functional group isomers
(3) mirror image isomers
(4) nonoisomers

86. Proteins have two different types of secondary structure α–helix and β–pleated sheet structure, α–helix structure is stabilized by :
(1) Peptide bonds   (2) Vander waals forces
(3) Hydrogen bonds
(4) Dipole dipole interactions

87. Select the incorrect statements about the complex $[Fe(H_2O)_5 NO]^{+2}$ formed in the brown ring test for nitrates is :

(1) Colour change in due to charge transfer

(2) It has iron + 1 oxidiation state & nitrosylas NO^+

(3) It has magnetic moment of 3.87 B.M. confirming three unpaired electrons in Fe

(4) Colour change is due to d–d–transition

88. Which of the following complex follow Sidgwkck rule of EAN

(Pt – 78, Ag – 47, Fe – 26, V–23)

(1) $[V(CO)_6]$ (2) $K_3[Fe(CN)_6]$

(3) $[Ag(CN)_2]$ (4) $[Pt(en)_2Cl_2]^{2+}$

89. 108 g fairly concentrate solution of $AgNO_3$ is electrolysed using 0.1 F electricity. The weight of resulting solution is

[At. wt of Ag = 108]

(1) 94 g   (2) 11.6 g

(3) 96.4 g   (4) None

90. For n^{th} order reaction $t_{1/2}$ depends on $(n \neq 0,1)$

(1) initial concentration only

(2) 'n' only

(3) initial concentration and 'n' both

(4) Sometimes 'n' and sometimes initial concentration

BIOLOGY

91. Maximum nutritional diversity is found in the group

(1) Plantae   (2) Fungi

(2) Animalia   (4) Monera

92. In taxonomic hierarchy, which of the following group of taxa will have more number of similarities as compared to other ?

(1) Anacardiaceae, Convolvulaceae and Poaceae

(2) Polymoniales, Poales and Sapindales

(3) *Solanum*, *Petunia* and *Atropa*

(4) Leopard, tiger and lion

93. TMV is

(1) ds Ribovirus

(2) ds Deoxyvirus

(3) ss Ribovirus

(4) Ribovirus with 6400 capsomeres

94. Diatomaceous earth is formed due to which substance?

(1) Phosphorus   (2) Calcium

(3) Silicon   (4) Copper

95. Select the incorrect match

Class   –   Member

(1) Phycomycetes   –   *Albugo*

(2) Basidiomycetes   –   *Claviceps*

(3) Ascomycetes   –   *Penicillium*

(4) Deuteromycetes   –   *Trichoderma*

96. Identify A, B and C in given diagram.
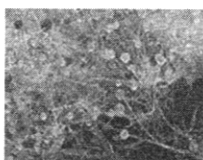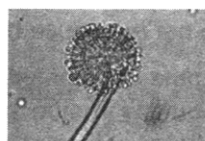
A   B   C

(1) A = *Mucor*, B = *Aspergillus*, C = *Agaricus*

(2) A = *Mucor*, B = *Agaricus*, C = *Aspergillus*

(3) A = *Agaricus*, B = *Mucor*, C = *Aspergillus*

(4) A = *Agaricus*, B = *Aspergillus*, C = *Mucor*

97. Flagellation in *Euglena* is

(1) Uniflagellation and stichonematic

(2) Isokont and whiplash type

(3) Heterokont and whiplash type

(4) Heterokont and stichonematic

98. Anoxygenic photosynthesis is characteristic of

(1) *Rhodospinillum*   (2) *Spirogyra*

(3) *Chlamydomonas*   (4) *Ulva*

99. Mark the correct statement for the organism given below in figure.
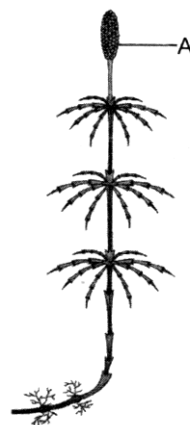
(1) The structure labelled A is male cone

(2) It is member of Sphenopsida

(3) Nodes are hollow while internodes are solid

(4) This is commonly called as stonewort

100. Match items in Column - I with those in column -II

Column – I		Column – II
a.	Peritrichous flagellation	(i) *Ginkgo*
b.	Living fossil	(ii) *Macrocystis*
c.	Rhizophore	(iii) *Escherichla coli*
d.	Smallest flowering plant	(iv) *Selaginella*
e.	Largest perennial alga	(v) *Wolffia*

    Select the correct answer from the following
    (1) a(ii), b(i), c(iii), d(iv), e(v)
    (2) a(v), b(iii), c(i), d(iv), e(i)
    (3) a(i), b(ii), c(v), d(iii), e(iv)
    (4) a(iii), b(i), c(iv), d(v), e(ii)

101. Sweet potato is homologous to
    (1) Ginger   (2) Turnip
    (3) Potato   (4) *Colocasia*

102. Which one of the following diagrams represent the placentation in *Dianthus* ?
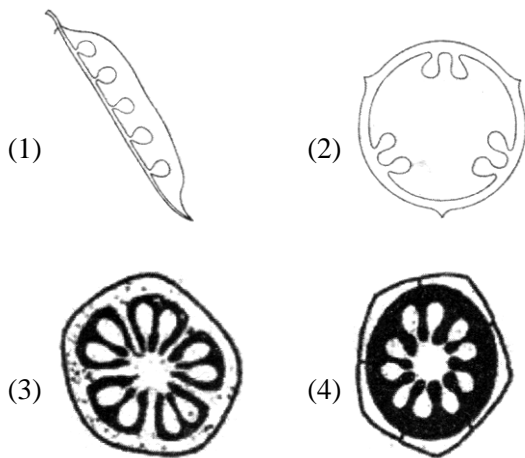
103. The correct floral formula of Soyabean is

    (1) $\% \o? K_{(5)}C_{1+(2)+2}A_{(9)+1}G_{\overline{1}}$ (2) $\% \o? K_{5}C_{1+(2)+2}A_{(9)+1}G_{\underline{1}}$

    (3) $\% \o? K_{(5)}C_{1+2+(2)}A_{(9)+1}G_{\underline{1}}$ (4) $\% \o? K_{(5)}C_{1+2+(2)}A_{1+(9)}G_{\overline{1}}$

104. Replum is present in the ovary of flower of
    (1) Pea   (2) Lemon
    (3) Mustard   (4) Sunflower

105. Juicy hair–like structures observed in the lemon fruit develop from
    (1) Exocarp   (2) Mesocarp
    (3) Endocarp   (4) Mesocarp and endocarp

106. Enzyme nitrogenase is
    (1) Cu-Fe protein
    (2) Found in prokaryotes only
    (3) An O_2 requiring enzyme
    (4) Essential to convert NH_3 to N_2

107. Find a correct set of requirements to fix a molecule of atmospheric nitrogen (N_2)
    (1) $8e^-$, $8H^+$, 8ATP   (2) $16e^-$, $16H^+$, 16ATP
    (3) $8e^-$, $8H^+$, 16ATP   (4) $16e^-$, $16H^+$, 8ATP

108. Which of the following is not a requirement of chemiosmosis ?
    (1) RuBisCO   (2) Membrane
    (3) ATPase enzyme   (4) Proton pump

109. How many additional ATP are used during synthesis of two molecules of hexose sugar in maize than tomato ?
    (1) 12   (2) 36
    (3) 24   (4) 8

110. The C_3 plants show CO_2 saturation
    (1) At about 360 μL^{-1}
    (2) Only below 450 μL^{-1}
    (3) Only beyond 540 μL^{-1}
    (4) Only beyond 450 μL^{-1}

111. NADH is oxidised to NAD^+ in
    (1) Aerobic respiration
    (2) EMP pathway
    (3) Fermentation
    (4) More than one option is correct

112. After glycolysis, first step of ethyl alcohol fermentation requires
    (1) Dehydrogenation   (2) Decarboxylation
    (3) FAD reduction   (4) Mn^{+2} acceptance

113. Arrange the RQ value of following respiratory substrates in ascending order.
    (a) $C_4H_6O_5$ (b) $C_6H_{12}O_6$
    (c) $C_{18}H_{36}O_2$ (d) Succulents (night)
    (1) (c), (b), (d) & (a)   (2) (d), (c), (b) & (a)
    (3) (b), (c), (a) & (d)   (4) (c), (b), (a) & (d)

114. Florigen results in conversion of
    (1) Reproductive bud $\rightarrow$ Vegetative bud
    (2) Shoot apex $\rightarrow$ Flowering bud
    (3) Root apex $\rightarrow$ Reproductive bud
    (4) Vegetative bud $\rightarrow$ Lateral shoot

115. Cork, secondary cortex and secondary xylem are formed through
    (1) Dedifferentiation   (2) Redifferentiation
    (3) Differentiation   (4) Obliteration

116. The wavelength of light absorbed by Pr form of phytochrome is
    (1) 660 nm   (2) 720 nm
    (3) 620 nm   (4) 640 nm

117. What would be the number of chromosomes in the meiocyte and gamete of onion respectively ?

(1) 24, 12　　　　　　(2) 34, 17

(3) 32, 16　　　　　　(4) 14, 17

118. Choose odd one w.r.t. vegetative propagule involved in cultivation in following plants

　(1) Banana　　　　　(2) Ginger

　(3) *Bryophyllum*　　(4) Potato

119. Pericarp is dry in

　(1) Guava, mango, mustard

　(2) Mango, groundnut, orange

　(3) Groundnut, mustard

　(4) Orange, guava, mango

120. Even in absence of pollination agents seed-setting is assured in

　(1) *Salvia*　　　　　(2) Fig

　(3) *Commellina*　　(4) *Zostera*

121. A polygenic trait is controlled by 3 genes A, B and C. In a cross AaBbCc × AaBbCc, the phenotypic ratio of the offsprings was observed as

　1 : 6 : x : 20 : x : 6 : 1

　What is the possible value of x ?

　(1) 3　　　　　　　　(2) 9

　(3) 15　　　　　　　(4) 25

122. Sequencing the whole set of genome that contained all the coding and non–coding sequences and later assigning different regions in the sequence with functions is known as

　(1) Sequence annotation　(2) PCR

　(3) Northern blot　　　(4) Microarray

123. The unequivocal proof of DNA as the genetic material came from the studies on a

　(1) Viroid　　　　　　(2) Bacterial virus

　(3) Bacterium　　　　(4) Fungus

124. Which one of the following pairs of codons is correctly matched with their function or the signal for the particular amino acid ?

　(1) UUA, UCA – Leucine

　(2) GUU, GCU – Alanine

　(3) UAG, UGA – Stop

　(4) AUG, ACG – Start / Methionine

125. Gene and cistron words are sometimes used synonymously because

　(1) One cistron contains many genes

　(2) One gene contains many cistrons

　(3) One gene contains one cistron

　(4) One gene contains no cistron

126. Select correct features w.r.t. trichomes in shoot system

　(a) Always unicelled

　(b) Branched or unbranched

　(c) May be secretory

　(d) Soft or stiff

　(e) Helps against transpiration

　(1) a, b, d and e　　　(2) All except 'c' and 'd'

　(3) All except 'a'　　　(4) a, c and e

127. Seat of origin of lateral root and formation of cork cambium are features related to

　(1) Endodermis　　　(2) Pericycle

　(3) Hypodermis　　　(4) Pith rays

128. Which one of the following pairs of organisms are exotic species introduced in India ?

　(1) *Nile perch*, *Ficus religiosa*

　(2) *Ficus religiosa, Lantana camara*

　(3) *Lantana camara*, Water hyacinth

　(4) Water hyacinth, *Prosopis cineraria*

129. According to IUCN red list what is the status of red Panda *(Ailurus fulgens)* ?

　(1) Vulnerable species

　(2) Critically endangered species

　(3) Extinct species

　(4) Endangered species

130. The correct sequence of plants in a hydrosere is

　(1) *Volvox* → *Hydrilla* → *Pistia* → *Scirpus* → *Lantana* → Oak

　(2) *Pistia* → *Volvox* → *Scirpus* → *Hydrilla* → Oak → *Lantana*

　(3) Oak → *Lantana* → *Volvox* → *Hydrilla* → *Pistia* → *Scirpus*

　(4) Oak → *Lantana* → *Scirpus* → *Pistia* → *Hydrilla* → *Volvox*

131. Match the following and select the correct option

Column – I	Column – II
a.　Earthworm	(i)　Pioneer species
b.　Succession	(ii)　Detritivore
c.　Ecosystem service	(iii)　Natality
d.　Population growth	(iv)　Pollination

　(1) a(i), b(ii), c(iii), d(iv)　(2) a(iv), b(i), c(iii), d(ii)

　(3) a(iii), b(ii), c(iv), d(i)　(4) a(ii), b(i), c(iv), d(iii)

132. During the process of ecological succession
    (1) Species diversity decreases
    (2) Structural complexity decreases
    (3) Niche become specialised
    (4) Food chain relationship becomes simple

133. Mark the incorrect match
    (1) Primary productivity - Varies in different types of ecosystem
    (2) GPP - Available biomass for the consumption of herbivores
    (3) 55 billion tones - Annual NPP of oceans
    (4) Secondary productivity - Rate of formation of new organic matter by consumers.

134. What type of human population is represented by the following age pyramid ?

    Post-reproductive

    Reproductive

    Pre-reproductive
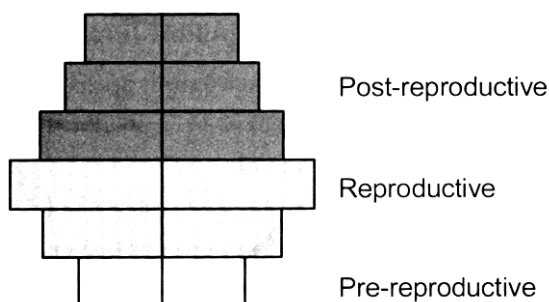
    (1) Expanding population (2) Vanishing population
    (3) Stable population (4) Declining population

135. The logistic population growth is expressed by the equation
    (1) $dN / dt = rN$

    (2) $dN / dt = rN\left(\dfrac{N-K}{N}\right)$

    (3) $dt / dN = rN\left(\dfrac{K-N}{K}\right)$

    (4) $dN / dt = rN\left(\dfrac{K-N}{K}\right)$

136. Which of the following is incorrect match ?
    (1) Torpedo – Electric ray, possesses electric organs
    (2) Trygon – Sting ray, possesses a poison sting on tail
    (3) Balaenoptera – Ampulla of Lorenzini, thermoreceptors
    (4) Scoliodon – In males pelvic fins bear claspers

137. Sycon belongs to a group of animals, which are best described as
    (1) unicellular or acellular
    (2) multicellular without any tissue organization
    (3) multicellular having tissue organization, but not body cavity
    (4) multicellular with a gastrovascular system

138. Energy relased from enzyme-substrate interaction is
    (1) activation energy   (2) binding energy
    (3) constant energy   (4) variable energy

139. The evolutionary importance of coelom is that is
    (1) Enables animals to have circulatory system and other organs that allow them to move
    (2) Allows animals to move onto land with an internal storage place for extra body fluid
    (3) Provided the possibility of evolving a hard protective exoskeleton
    (4) Paved the way for evolution of locomotory appendages

140. Which of the following statement is incorrect w.r.t. of ECG ?
    (1) The end of T–wave marks the end of systole
    (2) By counting the number of QRS complexes that occur in a given period, one can determine heart rate /pulse rate of an individual
    (3) Elevated ST wave in ECG indicates myocardial infarction
    (4) Enlarged Q wave indicates cardiac arrest

141. Consider the statement given below regarding contraception and answer as directed thereafter
    a– Medical termination of pregnancy (MTP) during first trimester is generally safe.
    b– Generally chances of conception are nil until mother breastfeeds the infant up to six year.
    c– Intrauterine devices like copper–T are effective contraceptives.
    d– Contraception pills may be taken up to one week after coitus to prevent conception
    Which two of the above statements are correct ?
    (1) a, c   (2) a, b
    (3) b, c   (4) c,d

142. In the polluted water bodies growth of the aerobic microbes helps in water treatment by
    (1) Reducing BOD and increasing dissolved oxygen
    (2) Increasing BOD and chemical oxygen demand
    (3) Reducing the dissolved nutrients
    (4) Increasing BOD and dissolved oxygen

143. Biomagnification is lowest in
   (1) Primary consumers
   (2) Secondary consumers
   (3) Producers
   (4) Decomposers

144. Match the amino acid in Column – I with their chemical nature in Column – II and choose the correct option given below

Column – I	Column –II
a. Glutamate	i. Aromatic
b. Lysine	ii. Neutral
c. Valine	iii. Acidic
d. Tyrosine	iv. Basic

   (1) a – iii, b – iv, c – ii, d – i
   (2) a – ii, b – i, c – iv, d – iii
   (3) a – iv, b – ii, c – i, d – ii
   (4) a – i, b – ii, c – iii, d – iv

145. Match the column I and II, and choose the correct combination from the options given

Column – I	Column –II
p. Water act	i. 1981
q. Environment protection act	ii. 1986
r. Air prevention and control of pollution act	iii. 1987
s. Amendment of Air act to include noise	iv. 1974

   (1) p – iv, q – iii, r – ii, s – i
   (2) p – iv, q – ii, r – i, s – iii
   (3) p – iii, q – ii, r – iv, s – i
   (4) p – iii, q – ii, r – i, s – iv

146. In case of increase in concentration of hydrogen ion, the Hb - O_2 dissociation curve will shift towards
   (1) Left side   (2) Right side
   (3) Remain as such, neither shift towards left nor towards right
   (4) First left and then right

147. Which of the following statement is not false ?
   (1) Intrinsic factor is essential for absorption of Vit B_{12}
   (2) Gastric gland never secretes even a small amount of lipase in adults
   (3) Rennin, a proteolytic enzyme (for milk proteins) found in gastic juice of infants
   (4) All

148. A wound making a hole through a person's chest brings about difficulty in breathing mainly because
   (1) it would damage the nerves to the diaphragm
   (2) air breathed in through the mouth and nose would escape through the hole
   (3) the negative pressure caused by action of the diaphragm would be lost through the hole
   (4) air would enter the lungs through the hole instead of the normal route through trachea and bronchi

149. This clotting factor is an important link between the intrinsic and extrinsic pathways and is deficient in haemophilia B
   (1) factor IX   (2) factor XII
   (3) factor VIII   (4) fibrinogen

150. The smallest cranial capacity is that of the
   (1) Modern man   (2) Cro–Magnon man
   (3) Neanderthal man   (4) Java man

151. The 'blue baby' syndrome results from
   (1) excess of dissolved oxygen
   (2) excess of TDS (total dissolved solids)
   (3) excess of chloride
   (4) methaemoglobinaemia

152. Photochemical smog pollution does not contain
   (1) Carbon dioxide
   (2) PAN (peroxyacyl nitrate)
   (3) Ozone
   (4) Nitrogen dioxide

153. Which fact about the mammary glands in human is false ?
   (1) A non–functional mammary gland is characteristic of all male mammals
   (2) Mammary glands are paired structures
   (3) It is a glandular tissue containing fixed amount of fat
   (4) Glandular tissue of each breast is divided into 15 – 20 mammary lobes containing clusters of cells called alveoli.

154. A protein is imagined as a line, the left end is represented by first amino acid and the right end is represented by the last amino acid. The first and last acids are called as
   (1) N–terminal amino acid and C–terminal amino acid respectively
   (2) C–terminal amino acid and N–terminal amino acid respectively
   (3) O–terminal amino acid and C-terminal amino acid respectively
   (4) NH_2 - terminal amino acid and COOH–terminal amino acid respectively

155. Which of the following is correctly matched w.r.t. era and its period ?
    (1) Paleozoic   –   Cretaceous
    (2) Mesozoic   –   Devonian
    (3) Cenozoic   –   Permian
    (4) Paleozoic   –   Carboniferous

156. Which of the folloiwng is an auto–immune disease?
    (1) Grave's disease   (2) Rheumatoid arthritis
    (3) Hashimoto's disease   (4) All of these

157. Interferons are
    (1) Allergens
    (2) Antibody molecules
    (3) Protein products of macrophages which destroy microbes
    (4) Protein secreted by virus infected cells which protect noninfected cells from further viral infection

158. Heroin is obtained by
    (1) alkylation of cocaine
    (2) acetylation of morphine
    (3) hydroxylation of morphine
    (4) methylation of benzodiazepines

159. Archaeopteryx is a connecting link between
    (1) Birds and reptiles
    (2) Reptiles and mammals
    (3) Annelids and arthropods
    (4) Amphibians and fishes

160. Epiboly is the process of
    (1) Rotation of gastrula within vitelline membrane so that animal pole becomes anterior
    (2) Overgrowth of micromeres which divide rapidly and spread downward over megameres except at yolk plug
    (3) Mass migration of cells from animal hemisphere so that upper micromeres migrate over edge of dorsal lip, roll inside and trucked beneath outer layer
    (4) Formation of small slit like invagination upon grey crescent

161. A transplant between individuals of the same species, but with different MHC/HLA alleles is
    (1) isograft   (2) allograft
    (2) autologus graft   (4) xenograft

162. Select the correct statement from the ones given below
    (1) Barbiturates when given to criminals make them tell the truth
    (2) Morphine is often given to persons who have undergone surgery as a pain killer
    (3) Chewing tobacco lowers blood pressur and heart rate
    (4) Cocaine is given to patients after surgery as it stimulates recovery

163. When population reaches carring capacity
    (1) Mortality Rate   =   Birth Rate
    (2) Mortality Rate   >   Birth Rate
    (3) Mortality Rate   <   Birth Rate
    (4) None of the above

164. Insulin facilitates the
    (1) Conversion of glucose in glycogen in the adipose tissue
    (2) Conversion of fats into fatty acids in the adipose tissue
    (3) Conversion of glucose in glycogen in the liver
    (4) Conversion of glycogen in glucose in the liver

165. I.   Adenine   IV. Cytosine
    II.   Guanine   V. Thymine
    III. Uracil
    Which of the above are represent pyrimidines ?
    (1) I, II, III   (2) II, III, IV
    (3) III, IV, V   (4) II, V, III

166. Diagram mention below showing intercellular compartment, which is correct order of cell walls
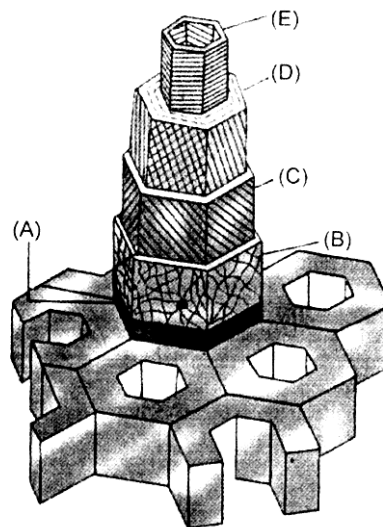
    (1) A–Primary cell wall, B–middle lamella, C Secondary wall–1, D–Secondary wall–2, E secondary wall–3
    (2) A– Middle lamella, B–Primary cell wall, C Secondary wall–1, D–Secondary wall–2, E Secondary wall –3
    (3) A–Primary cell wall, B–Middle lamella, C Secondary wall–3, D secondary wall-2, E Secondary wall –1
    (4) A–Secondary wall–1, B–Secondary wall–2, C– Secondary wall–3, D–Middle lamella, E–Primary cell wall

167. In which of the following condition progressive degenertion of skeletal muscles happens ?
   (1) Myasthenia gravis   (2) Muscular dystrophy
   (3) Tetany   (4) Arthritis

168. The function of Na^+ and K^+ pump is to move
   (1) Na^+ in and K^+ out   (2) Na^+ out and K^+ in
   (3) Na^+ out and Cl^- in   (4) Cl^- out and Na^+ in

169. Just a Xenopsylla is to Yersenia pestis, so is
   (1) Glossina palpalis to Wuchereria bancrofti
   (2) Culex to Plasmodium Falciparum
   (3) Homo sapiens to Taenia solium
   (4) Phlebotomus to Leishmania donovani

170. Exotic bread of cattle is
   (1) Friesian   (2) Holstein
   (3) Jersey   (4) All of the above

171. Match the following list of bioactive substances and their roles :

i.	Statin	a.	Removal of oil stains
ii.	Cyclosporin A	b.	Removal of clots from blood vessels
iii.	Streptokinase	c.	Lowering of blood cholesterol
iv.	Lipase	d.	Immunosuppressive agent

   Choose the correct match
   (1) i – b, ii – c, iii – a, iv – d
   (2) i – d, ii – b, iii – a, iv – c
   (3) i – d, ii – a, iii – b, iv – c
   (4) i – c, ii – d, iii – b, iv – a

172. In the secondary treatment of sewage, the order in which microbe growth is stimulated is
   (1) First aerobic, then anaerobic
   (2) First anaerobic then aerobic
   (3) Only aerobic microbes used
   (4) Only anaerobic microbes used

173. Read the following statements regarding HIV virus
   A. It is a type of retrovirus which has an envelope enclosing the diploid RNA genome
   B. It multiplies in helper T cells and produces progeny virus
   C. In the macrophages of host, RNA genome of the virus replicates to form viral DNA
   D. reverse transcriptase becomes inactive in the host cell
   How many of the above statements are correct ?
   (1) One   (2) Two
   (3) Four   (4) Three

174. Fossil X is older than fossil Y because :
   (1) Fossil Y was found in deeper sedimentation
   (2) Fossil X was found in deeper sedimentation
   (3) Fossil Y has some vestigial organs functional in X
   (4) Fossil Y has homologous and analogous organs of X

175. A potential danger to a population that has been greatly reduced in number is the :
   (1) Reduced gene flow
   (2) Hardy - Weinberg disequilibrium
   (3) Tendency towards assorative mating
   (4) Loss of genetic variability

176. Disruptive selection :
   (1) Eliminates uncommon forms of alelles
   (2) Does not favour intermediate forms of a trait
   (3) Shifts allele frequencies in a steady, consistent direction
   (4) All of the above

177. Industrial melanism is an example of :
   (1) Mutation   (2) Neo–Darwinism
   (3) Natural selection   (4) Neo–Lamarckism

178. The sympathetic nerves, in mammals, arise from
   (1) sacral nerves
   (2) 3rd, 7th, 9th and 10th cranial nerves
   (3) thoraco–lumbar nerves
   (4) cervical nerves

179. Given below is a schematic break up of the phases/stages of cell cycle
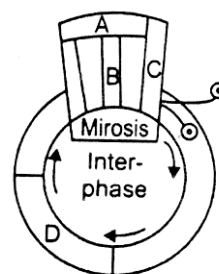
   Which one of the following is the correct indication of the stage/phase in the cell cycle ?
   (1) A–Cytokinesis   (2) B–Metaphase
   (3) C–Karyokinesis   (4) D–Synthetic phase

180. A woman may develop beard and moustaches due to
   (1) Hypersecretion of adrenal cortex
   (2) Hypersecretion of thyroxine
   (3) Hyposecretion of adrenaline
   (4) Hyposecretion of thyroxine

Target Test Series for NEET-2021

FULL TEST : 02 ANSWERS

| #	Ans		#	Ans		#	Ans		#	Ans
1.	(4)		46.	(4)		91.	(4)		136.	(3)
2.	(3)		47.	(4)		92.	(4)		137.	(2)
3.	(3)		48.	(2)		93.	(3)		138.	(2)
4.	(2)		49.	(3)		94.	(3)		139.	(1)
5.	(1)		50.	(2)		95.	(2)		140.	(4)
6.	(2)		51.	(4)		96.	(1)		141.	(1)
7.	(2)		52.	(4)		97.	(4)		142.	(1)
8.	(4)		53.	(4)		98.	(1)		143.	(1)
9.	(3)		54.	(4)		99.	(2)		144.	(1)
10.	(4)		55.	(4)		100.	(4)		145.	(2)
11.	(1)		56.	(4)		101.	(2)		146.	(2)
12.	(1)		57.	(3)		102.	(4)		147.	(4)
13.	(4)		58.	(4)		103.	(3)		148.	(3)
14.	(1)		59.	(3)		104.	(3)		149.	(1)
15.	(3)		60.	(2)		105.	(3)		150.	(4)
16.	(4)		61.	(3)		106.	(2)		151.	(4)
17.	(1)		62.	(3)		107.	(3)		152.	(1)
18.	(2)		63.	(1)		108.	(1)		153.	(3)
19.	(2)		64.	(3)		109.	(3)		154.	(1)
20.	(3)		65.	(1)		110.	(4)		155.	(4)
21.	(1)		66.	(4)		111.	(4)		156.	(4)
22.	(2)		67.	(1)		112.	(2)		157.	(4)
23.	(2)		68.	(2)		113.	(2)		158.	(2)
24.	(2)		69.	(2)		114.	(2)		159.	(1)
25.	(4)		70.	(4)		115.	(2)		160.	(2)
26.	(4)		71.	(4)		116.	(1)		161.	(2)
27.	(4)		72.	(4)		117.	(3)		162.	(2)
28.	(2)		73.	(2)		118.	(3)		163.	(1)
29.	(3)		74.	(4)		119.	(3)		164.	(3)
30.	(2)		75.	(3)		120.	(3)		165.	(3)
31.	(3)		76.	(2)		121.	(3)		166.	(2)
32.	(1)		77.	(4)		122.	(1)		167.	(2)
33.	(4)		78.	(2)		123.	(2)		168.	(2)
34.	(1)		79.	(3)		124.	(3)		169.	(4)
35.	(1)		80.	(1)		125.	(3)		170.	(4)
36.	(4)		81.	(2)		126.	(3)		171.	(4)
37.	(1)		82.	(2)		127.	(2)		172.	(1)
38.	(1)		83.	(2)		128.	(3)		173.	(4)
39.	(3)		84.	(1)		129.	(4)		174.	(2)
40.	(1)		85.	(2)		130.	(1)		175.	(4)
41.	(1)		86.	(3)		131.	(4)		176.	(2)
42.	(2)		87.	(4)		132.	(3)		177.	(3)
43.	(3)		88.	(4)		133.	(2)		178.	(3)
44.	(4)		89.	(3)		134.	(4)		179.	(4)
45.	(4)		90.	(3)		135.	(4)		180.	(1)

HINTS AND SOLUTIONS

PHYSICS

1. (2)

$2V_A = 3V_B$

$V_A = \dfrac{3v_0}{2}$

2. (3)

When a cart moves with some acceleration toward right, then a pseudo force (ma) acts on block towards left. The force (ma) is action force by a block on cart. Now, block will remain static w.r.t. cart, if frictional force $\pi R \geq mg$

$\Rightarrow \mu ma \geq mg$ [as R = ma]

$\Rightarrow a \geq \dfrac{g}{\mu}$

3. (3)
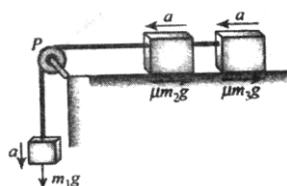
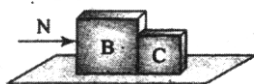$a = \dfrac{m_1 g - \mu(m_2 + m_3)g}{m_1 + m_2 + m_3} = \dfrac{m[g - 2\mu g]}{3m}$

$= \dfrac{g}{3}[1 - 2\mu]$

4. (4)

Acceleration of system of blocks is

$a = \dfrac{F}{m_A + m_B + m_C} = \dfrac{14}{4 + 2 + 1} = 2 \text{ m/s}^2$

Taking the blocks B and C as system

$N = (m_B + m_C) = (2 + 1) \times 2 = 6 \text{ N}$

5. (1)

By the law of conservation of energy.

i.e., $\Delta K + \Delta U = 0$

$\left(0 - \dfrac{1}{2}mv^2\right) + \left(\dfrac{1}{2}kx^2 - 0\right) = 0$

$\dfrac{1}{2}mv^2 = \dfrac{1}{2}kx^2$

$\Rightarrow x^2 = \dfrac{mv^2}{k}$

$\Rightarrow x = \sqrt{\left(\dfrac{mv^2}{k}\right)}$

$\Rightarrow x = \sqrt{\left(\dfrac{0.5 \times 1.5 \times 1.5}{50}\right)}$

$= 0.15 \text{ m}$

6. (2)

Work done = Area enclosed by F–x graph

$= \dfrac{1}{2} \times (3 + 6) \times 3 = 13.5 \text{J}$

7. (2)

$F = \dfrac{2mv \sin 30°}{t}$

Given, m = 0.5 kg, v = 12 m/s. t = 0.25 s

$\theta = 30°$

Hence, $F = \dfrac{2 \times 0.5 \times 12 \sin 30°}{0.25} = 24\text{N}$

8. (4)

$\Delta K + \Delta U = 0$

$\left[0 - \left(\dfrac{1}{2}I\omega^2 + \dfrac{1}{2}mv^2\right)\right] + \left(mg \times \dfrac{3v^2}{4g}\right) = 0$

$= \dfrac{1}{2}I\omega^2 = \dfrac{3}{4}mv^2 - \dfrac{1}{2}mv^2 = \dfrac{mv^2}{2}\left(\dfrac{3}{2} - 1\right)$

As cylinder is rolling $\omega = \dfrac{v}{R}$

or $\dfrac{1}{2}I\dfrac{v^2}{R^2} = \dfrac{mv^2}{4}$ or $I = \dfrac{1}{2}mR^2$

Hence, object is a disc

9. (3)

Initial angular momentum $L_{initial} = mv_0 R$

Initial angular momentum $L_{final} = mv\dfrac{R}{2}$

Conservation of angular momentum

$$mv_0R_0 = mv\frac{R_0}{2} \Rightarrow v = 2v_0$$

$$KE = \frac{1}{2}mv^2 = 2mv_0^2$$

10. **(4)**

$$I = I_A + I_B + I_C$$

$$= \left(\frac{2}{3}mv^2 + mr^2\right) + \left(\frac{2}{3}mr^2 + mr^2\right) + \frac{2}{3}mr^2$$

$$= 4\,mr^2$$

11. **(1)**

Gravitational potential at point a/2 distance from centre.

$$= -\frac{GM}{a} - \frac{GM}{a/2} = -\frac{3GM}{a}$$

12. **(1)**

Intensity of gravitational field (E) of the earth with distance (r) from the centre of the earth

$$E_{inside} = -\frac{GMr}{R^3} \Rightarrow E_{inside} \propto -r$$

$$E_{outside} = -\frac{GM}{r^2} \Rightarrow E_{outside} \propto -\frac{1}{r^2}$$

13. **(4)**

14. **(2)**

Pressure at equal depth is same

15. **(3)**

Conceptual

16. **(4)**

Heat gain by water = Heat lost by stem

$$m_H s_H \Delta\theta_1 = mLv + ms_H\Delta\theta_2$$
$$20 \times 1 \times (80 - 10) = m \times 540 + m \times 1 \times (100 - 80)$$
$$\Rightarrow 1400 = 560\,m \qquad \Rightarrow m = 2.5\,g$$
Total mass of water = 20 + 2.5 = 22.5 g

17. **(1)**

Newton's law of cooling

$$\frac{\theta_1 - \theta_2}{\Delta_t} = k\left[\frac{\theta_1 + \theta_2}{2} - \theta_0\right]$$

$$First \Rightarrow \frac{70-60}{5} K[65 - \theta_0]$$

$$\Rightarrow 2 = K[65 - \theta_0] \qquad\qquad (i)$$

$$Next \Rightarrow \frac{60-54}{5} = K[57 - \theta_0] \qquad (ii)$$

Dividing (i) and (ii) $\frac{5}{3} = \frac{65 - \theta_0}{57 - \theta_0}$

$$\Rightarrow 285 - 5\theta_0 - 195 - 3\theta_0 \Rightarrow 2\theta_0 = 90$$

$$\theta_0 = 45°$$

18. **(2)**

From the first law of thermodynamics

$$\Delta Q = \Delta U + \Delta W$$

For cyclic process $\Delta U = 0$

Hence Q = W

Work done W = area under P – V diagram

$$\Rightarrow Q = -2PV$$

19. **(2)**

Work done in PV–diagram is equal to area enclosed in P–V curve

$$\Rightarrow W = \frac{1}{2} \times 5 \times 10^{-3} \times 4 \times 10^5 = 10 \times 10^2$$

$$= 1000\,J$$

20. **(3)**

$$T \propto \sqrt{l}$$

21. **(1)**

$$m_1 g = KA$$

22. **(2)**

Hence, apparent frequency heard by the observer (driver) is given by

$$f' = f\left(\frac{v + v_0}{v - v_0}\right) \qquad (i)$$

where v = velocity of sound,

v_0 = velocity of car = v_s

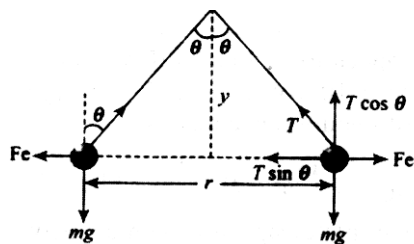Frequency of reflected sound heard by driver

$$n' = n\left(\frac{v + v_0}{v - v_s}\right)$$

It is given that n' = 2n

Hence, $2n = n\left(\dfrac{v + v_{car}}{v - v_{car}}\right) \Rightarrow v_{car} = v/3$

23. **(2)**

$$T\sin\theta = F_e$$
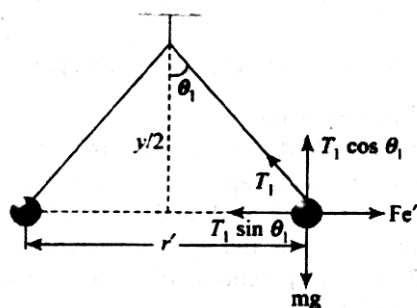
$T \sin \theta = F_e$ (i)

$T \cos \theta = mg$ (ii)

$$\tan \theta = \frac{F_e}{mg} \Rightarrow F_e = mg \tan \theta$$

Here, $F_e = k\dfrac{q^2}{r^2} = mg\dfrac{r/2}{y}$ (iii)

$T_1 \sin \theta_1 = F_e'$ (iv)

$T_1 \cos \theta_1 = mg$ (v)

$$\tan \theta_1 = \frac{F_e'}{mg} \Rightarrow F_e' = mg \tan \theta_1$$

Here $F_e' = k\dfrac{q^2}{r^2} = mg\dfrac{r'/2}{y/2}$ (vi)

From (iii) & (iv)

$$\frac{kq^2/r^2}{kq^2 r'^2} = \frac{r}{2r'}$$

$$\Rightarrow \left(\frac{r'^2}{r}\right) = \frac{1}{2} \text{ or } r' = \frac{r}{2^{1/3}}$$

24. **(2)**

$$P' = \sqrt{P^2 + P^2} = \sqrt{(qa)^2 + (qa)^2} = \sqrt{2}qa$$

25. **(4)**

$$c_{eff} = \frac{3}{2}c$$

26. **(4)**

$$V_{AB} = \sum iR - \sum \varepsilon$$

27. **(4)**

The gievn circuit is a balanced Whetstone's bridge circuit. Hence potential difference between A and B is zero.

28. **(2)**

When the proton is released from rest, it will experience force only due to electric field. Initial

acceleration of proton $a_0 = \dfrac{eE}{m} \Rightarrow \dfrac{ma_0}{e}$

Now the proton is projected towards north with a speed v_0

Initial acceleration of proton $3a_0 \dfrac{ev_0 B + eE}{m}$

$\Rightarrow ev_0 B + eE = 3ma_0$

$\Rightarrow ev_0 B = 3ma_0 - eE = 3ma_0 - ma_0 = 2ma_0$

$\Rightarrow B = \dfrac{2ma_0}{ev_0}$

29. **(3)**

Magnetic field due to straight wire I

$$\vec{B}_1 = \frac{\mu_0 i}{4\pi R}[\sin 90 + \sin 0°](-\hat{k})$$

$$= \frac{-\mu_0 I}{4\pi R}(\hat{k}) = \vec{B}_3$$

Magnetic field due to semicircular wire 2

$$B_2 = \frac{\mu_0 I}{4R}(-\hat{i}) = \frac{-\mu_0 I}{4\pi R}(\pi\hat{i})$$

Magnetic field $\vec{B}$ at centre, $\vec{B}_c = \vec{B}_1 + \vec{B}_2 + \vec{B}_3$

$$\Rightarrow \vec{B}_c = -\frac{\mu_0 I}{4\pi R}(\pi\hat{i} + 2\hat{k})$$

30. **(2)**

$$I = I_0 \cos^2 \phi$$

31. **(3)**

32. **(1)**

Magnetic flux density at O due to $C_1 D_1$

$$B_1 = \frac{\mu_0}{4\pi} \cdot \frac{2\pi i}{r} \frac{\theta}{2\pi} \text{outwards}$$

Magnetic flux density due to $C_2 D_2$ at O,

$B_2 = \dfrac{\mu_0}{4\pi} \cdot \dfrac{2\pi i}{2r} \cdot \dfrac{\theta}{2\pi}$ inwards

Similarly $B_3 = \dfrac{\mu_0}{4\pi} \cdot \dfrac{2\pi i}{2r} \cdot \dfrac{\theta}{2\pi}$ outwards

Taking outward field as positive and inward field as negative

Total magnetic field induction at O is

$B = \dfrac{\mu_0}{4\pi} \cdot \dfrac{2\pi i}{r} \cdot \dfrac{\theta}{2\pi}\left[1 - \dfrac{1}{2} + \dfrac{1}{4} - \dfrac{1}{8} + \dots \infty\right]$
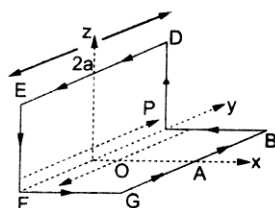
$\dfrac{\mu_0}{4\pi} \cdot \dfrac{i\theta}{r}\left[\dfrac{1}{1+\dfrac{1}{2}}\right]$

$= 10^{-7} \times \dfrac{7}{11} \times \dfrac{\pi}{3} \times \dfrac{2}{3}$

$= \dfrac{4}{9} \times 10^{-6}$ tesla outward

33. (4)

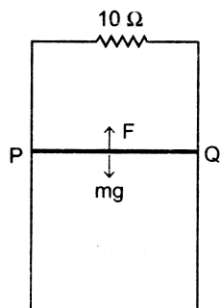The given loop is equivalent to two loops FGBPF and PDEFP.

Magnetic field due to loop PDEFP is along positive x-axis i.e., along $\hat{i}$. Therefore the direction of resultant magnetic field induction is along the resultant of $\hat{i}$ and $\hat{k}$ i.e. $\dfrac{1}{\sqrt{2}}(\hat{i}+\hat{k})$

34. (1)

$F = Bil = B\dfrac{e}{R}\cdot l = B\cdot\dfrac{(Blv)}{R}\cdot l$

For velocity to be constant, net force on PQ is zero

$\therefore \quad mg = F = \dfrac{B^2 l^2}{R} v$

$\therefore \quad \upsilon = \dfrac{mgR}{B^2 l^2}$

$= \dfrac{100}{1000} \times \dfrac{10 \times 10 \times 100 \times 100}{4 \times 50 \times 50} \qquad = 10 \text{ms}^{-1}$

35. (1)

$e = \dfrac{d\phi}{dt} = -B.\dfrac{dA}{dt}$

$e = -(40 \times 10^{-3})(-0.4)$

$= 16 \times 10^{-3}\,\text{V} = 16\,\text{mV}$

36. (4)

37. (1)

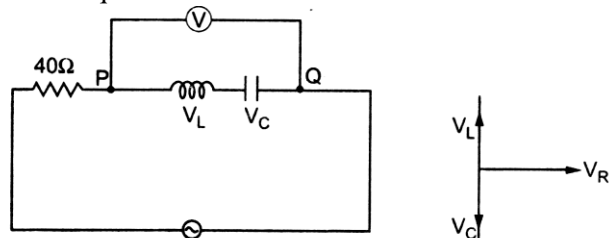$V_{rms} = \sqrt{\dfrac{V_0^2 + 0^2}{2}} = \dfrac{V_0}{\sqrt{2}}$

$V_{rms}^2\, T = \int_0^{T/2} V_0^2.dt + \int_{T/2}^{T} 0^2.dt = V_0^2 \cdot \dfrac{T}{2}$

$\therefore\ V_{rms}^2 = V_0^2 \dfrac{T}{2} \cdot \dfrac{1}{T} = \dfrac{V_0^2}{2}$

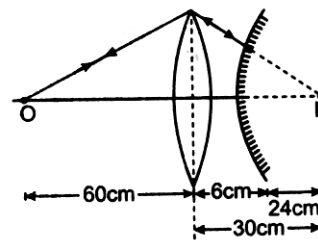or $\ V_{rms} = \dfrac{V_0}{\sqrt{2}}$

38. (1)

The equivalent circuit is

$X_L = X_C \qquad\qquad \therefore\ V_L = V_C$

$\therefore\ V_L - V_C = 0 \qquad$ or $\quad V_{PQ} = 0$

39. (1)

For the lens

$u = -60$

$f = +20$

$$\frac{1}{\upsilon} - \frac{1}{u} = \frac{1}{f}$$

$$\therefore \quad \frac{1}{\upsilon} = \frac{1}{f} + \frac{1}{u}$$

$$= \frac{1}{20} - \frac{1}{60}$$

$\therefore \quad \upsilon = 30\,\text{cm}$

40. (1)

In carbon $_6C^{12}$, there are 6 protons and 6 neutrons.

$6m_p = 6 \times 1.0078\,\text{u}$

$\quad = 6.0468\,\text{u}$

$6m_n = 6 \times 1.0087\,\text{u}$

$\quad = 6.0522\,\text{u}$

$\Delta m = 6.0468 + 6.0522 - 12.0000$

$\quad = 0.0990\,\text{u}$

or   B.E. $= 0.099 \times 931.4\,\text{MeV}$

$\quad = 92.2\,\text{MeV}$

Thus B.E. per nucleon $= \dfrac{92.2}{12} = 7.68\,\text{MeV}$

41. (1)

Rydberg constants are given by

$$R_H = \frac{R_\infty}{1 + \dfrac{m}{M_H}}, R_D = \frac{R_\infty}{1 + \dfrac{m}{M_D}}$$

$$R_\alpha = \frac{R_\infty}{1 + \dfrac{m}{M_\alpha}}$$

Since, $M_\alpha > M_D > M_H$

$\therefore \quad R_\alpha > R_D > R_H$

But $\lambda \propto \dfrac{1}{\text{Rydberg cons} \tan t}$

$\lambda_p > \lambda_D > \lambda_\infty$

$\therefore \quad \lambda_p > \lambda_D$ or $\lambda_D < \lambda_p$

42. (2)

$$\lambda_{min} = \frac{hc}{eV}$$

and de Broglie wavelength of the electron

$$= \lambda_d = \frac{h}{\sqrt{2meV}}$$

$$\therefore \quad \frac{\lambda_{min}}{\lambda_d} = \frac{hc}{eV} \times \frac{\sqrt{2meV}}{h}$$

$$= c\sqrt{\frac{2m}{eV}}$$

$$= 3 \times 10^8 \sqrt{\frac{2 \times 9.1 \times 10^{-31}}{1.6 \times 10^{-19} \times 10^4}}$$

$$= 10.1$$

43. (3)

$4 \times 1.1 = 4.4\,\text{MeV}$

$4 \times 7 = 28\,\text{MeV}$

$E = (28 - 4.4)\,\text{MeV} = 23.6\,\text{MeV}$

44. (4)

For forward bias, the voltage on n–side should be more negative than that on p–side and this condition is fulfilled in (4) only.

45. (1)

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50. (4)