

DATE : 07/05/2017



Aakash

Medical | IIT-JEE | Foundations

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Test Booklet Code

Y

(PITA)

Time : 3 hrs.

Max Marks : 720

Answers & Solutions

for

NEET - 2017

IMPORTANT INSTRUCTIONS :

1. The Answer Sheet is inside this Test Booklet. When you are directed to open the Test Booklet , take out the Answer Sheet and fill in the particulars on **side-1** and **side-2** carefully with **blue / black** ball point pen only.
2. The test is of **3** hours duration and Test Booklet contains 180 questions. Each question carries **4** marks. For each correct response, the candidate will get **4** marks. For each incorrect response, **one mark** will be deducted from the total scores. The maximum marks are **720**.
3. Use **Blue/ Black Ball Point Pen only** for writing particulars on this page/ marking responses.
4. Rough work is to be done on the space provided for this purpose in the Test Booklet only.
5. **On completion of the test, the candidate must hand over the Answer Sheet to the invigilator before leaving the Room/Hall. The candidates are allowed to take away this Test Booklet with them.**
6. The CODE for this Booklet is **Y**. Make sure that the code printed on **Side-2** of the Answer Sheet is the same as that on this Test Booklet. In case of discrepancy, the candidate should immediately report the matter to the Invigilator for replacement of both the Test Booklet and the Answer Sheet.
7. The candidate should ensure that the Answer Sheet is not folded. Do not make any stray marks on the Answer sheet. Do not write your Roll No. anywhere else except in the specified space in the Test Booklet / Answer Sheet.
8. Use of white fluid for correction is **NOT** permissible on the Answer Sheet.

1. A molecule of a substance has permanent dipole moment p . A mole of this substance is polarised by applying a strong electrostatic field E . The direction of the field is suddenly changed by an angle of 60° . If N is the Avogadro's number the amount of work done by the field is :

- (1) $2 N p E$ (2) $\frac{1}{2} N p E$
(3) $N p E$ (4) $\frac{3}{2} N p E$

Answer (2)

Sol. $W = NPE [\cos 0^\circ - \cos 60^\circ]$

$$= \frac{1}{2} NPE$$

2. If the angle of a prism is 60° and angle of minimum deviation is 40° , then the angle of refraction will be

- (1) 4° (2) 30°
(3) 20° (4) 3°

Answer (2)

Sol. $r = \frac{A}{2} = \frac{60^\circ}{2} = 30^\circ$

3. A student performs an experiment of measuring the thickness of a slab with a vernier calliper whose 50 divisions of the vernier scale are equal to 49 divisions of the main scale. He noted that zero of the vernier scale is between 7.00 cm and 7.05 cm mark of the main scale and 23rd division of the vernier scale exactly coincides with the main scale. The measured value of the thickness of the given slab using the calliper will be :

- (1) 7.73 cm (2) 7.23 cm
(3) 7.023 cm (4) 7.073 cm

Answer (3)

Sol. $L.C = 1MSD - 1VSD$

$$= 0.05 - \frac{49}{50} \times 0.05$$

$$= 0.001 \text{ cm}$$

$$\text{Thickness} = 7.0 + 23 \times 0.001$$

$$= 7.023 \text{ cm}$$

4. If the longest wavelength in the ultraviolet region of hydrogen spectrum is λ_0 . then the shortest wavelength in its infrared region is :

- (1) $\frac{46}{7} \lambda_0$ (2) $\frac{20}{3} \lambda_0$
(3) $\frac{36}{5} \lambda_0$ (4) $\frac{27}{4} \lambda_0$

Answer (4)

Sol. longest wavelength in uv in Lyman series

$$\frac{1}{\lambda_0} \propto (10.2) \text{ eV}$$

Shortest wavelength in I.F in Paschen series

$$\frac{1}{\lambda} \propto 1.51 \text{ eV}$$

$$\frac{\lambda}{\lambda_0} = \frac{27}{4} \therefore \lambda = \frac{27}{4} \lambda_0$$

5. A circular coil of radius 10 cm, 500 turns and resistance 2Ω is placed with its plane, perpendicular to the horizontal component of the earth's magnetic field. It is rotated about its vertical diameter through 180° in 0.25s. The induced e.m.f in the coil is (Take $H_E = 3.0 \times 10^{-5} \text{ T}$) :

- (1) $6.6 \times 10^{-4} \text{ V}$ (2) $1.4 \times 10^{-2} \text{ V}$
(3) $2.6 \times 10^{-2} \text{ V}$ (4) $3.8 \times 10^{-3} \text{ V}$

Answer (4)

Sol. $E_{av} = -\frac{\Delta q}{\Delta t}$

$$= \frac{NAB[\cos 0 - \cos 180]}{\Delta t} = 3.8 \times 10^{-3} \text{ V}$$

6. Two reasons for using soft iron as the material for electromagnets

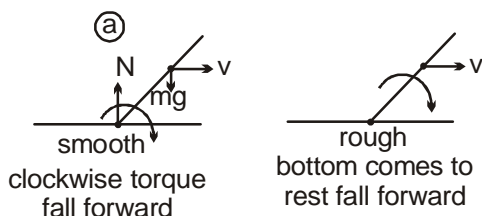
- (1) low permeability and high retentivity
(2) high permeability and low retentivity
(3) low permeability and low retentivity
(4) high permeability and high retentivity

Answer (2)

7. A girl jumps down from a moving bus, along the direction of motion of the bus, tilting slightly forward. She falls on (a) a sheet of ice (b) a patch of glue.

- (1) In case (a) she falls backward and in case (b) she falls forward
- (2) In both cases (a) and (b) she falls forward
- (3) In both cases (a) and (b) she falls backward
- (4) In case (a) she falls forward and in case (b) she falls backward

Answer (2)



Sol.

8. A person has near point at 60 cm. The focal length of spectacles lenses to read at 22 cm having glasses separated 2 cm from the eyes, is :

- (1) 40 cm
- (2) 10 cm
- (3) 20 cm
- (4) 30 cm

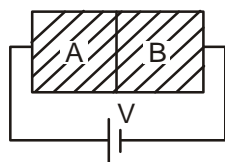
Answer (4)

Sol. $v = -60$ cm $u = -20$ cm

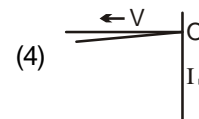
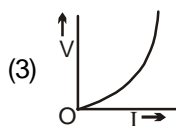
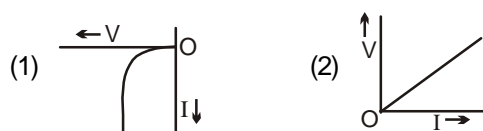
$$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$

$$f = 30 \text{ cm}$$

9. Two sides of a semiconductor germanium crystal A and B are doped with arsenic and indium, respectively. They are connected to a battery as shown in figure



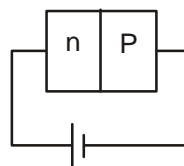
The correct graph between current and voltage for the arrangement is



Answer (1)

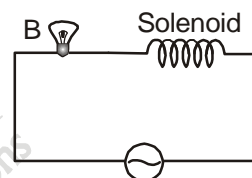
Sol. Arsenic – pentavalent

Indium – trivalent



Reverse Bias

10. A bulb connected in series with an air-cored solenoid is lit an a.c source. If a soft iron core is introduced in the solenoid



- (1) The bulb stops glowing
- (2) The bulb will glow brighter
- (3) There is no change in glow of bulb
- (4) The bulb will become dimmer

Answer (4)

Sol. $X_L = L\omega$

more is μ more is L and \therefore more is X_L and less is current

11. Due to Doppler effect, the shift in wavelength observed is 0.1\AA , for a star producing a wavelength 6000\AA . The velocity of recession of the star will be :

- (1) 20 km s^{-1}
- (2) 2.5 km s^{-1}
- (3) 10 km s^{-1}
- (4) 5 km s^{-1}

Answer (4)

Sol. $\Delta\lambda = 0.1\text{\AA}$, $\lambda = 6000\text{\AA}$

$$\frac{\Delta\lambda}{\lambda} = \frac{V}{C} \Rightarrow \frac{0.1}{6000} = \frac{V}{3 \times 10^8}$$

$$\Rightarrow V = \frac{3 \times 10^8 \times 0.1}{6000} = \frac{3 \times 10^7}{6 \times 10^3} = 0.5 \times 10^4.$$

12. A metal rod of 1m length, is dropped exact vertically on to a hard metal floor. With an oscilloscope, it is determined that the impact produces a longitudinal wave of 1.2k Hz frequency. The speed of sound in the metal rod is :

- (1) 600 m/s (2) 2400 m/s
(3) 1800 m/s (4) 1200 m/s

Answer (2)

Sol. $f = \frac{V}{2l}$

$$1.2 \times 10^3 = \frac{V}{2 \times 1} \quad V = 2.4 \times 10^3 \text{ m/s}$$

13. The angular momentum of a rigid body of mass m about an axis is n times the linear momentum (P) of the body. Total kinetic energy of the rigid body is :

- (1) $\frac{n^2 P^2}{2}$ (2) $\frac{P^2 [1+n^2]}{2m}$
(3) $\frac{n^2 P^2}{2m}$ (4) $n^2 P^2 \times 2m$

Answer (Incomplete Data)

14. A parallel-plate capacitor is to be designed, using a dielectric of dielectric constant 5, so as to have a dielectric strength of 10^9 Vm^{-1} . If the voltage rating of the capacitor is 12kV, the minimum area of each plate required to have a capacitance of 80 pF is :

- (1) $10.5 \times 10^{-6} \text{ m}^2$ (2) $21.7 \times 10^{-6} \text{ m}^2$
(3) $25.0 \times 10^{-5} \text{ m}^2$ (4) $12.5 \times 10^{-5} \text{ m}^2$

Answer (2)

Sol. $K = 5, E = 10^9 \text{ V/m}, V = 12 \times 10^3 \text{ V}$

$C = 80 \times 10^{-12} \text{ F}, A = ?$

$$C = \frac{K \epsilon_0 A}{d}, E = \frac{V}{d} \quad C = \frac{K \epsilon_0 A E}{V}$$

$$80 \times 10^{-12} = \frac{5 \times 8.85 \times 10^{-12} \times A \times 10^9}{12 \times 10^3}$$

$$A = \frac{80 \times 10^{-12} \times 12 \times 10^3}{5 \times 8.85 \times 10^{-12} \times 10^9} = \frac{960 \times 10^{-9}}{5 \times 8.854 \times 10^{-3}} = 21.7 \times 10^{-6}$$

15. A cyclist on a level road takes a sharp circular turn of radius 3m ($g=10\text{ms}^{-2}$). If the coefficient of static friction between the cycle tyres and the road is 0.2,

at which of the following speeds will the cyclist not skid while taking the turn?

- (1) 14.4 km h⁻¹ (2) 7.2 km h⁻¹
(3) 9 km h⁻¹ (4) 10.8 km h⁻¹

Answer (2)

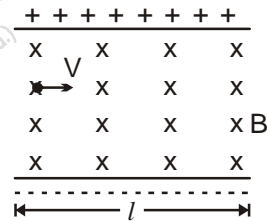
Sol. $r = 3\text{m}, \mu = 0.2$

$$\frac{V_{\max}}{rg} = \mu$$

$$\Rightarrow V_{\max} = \sqrt{\mu rg}$$

$$= \sqrt{0.2 \times 3 \times 10} = \sqrt{6} \text{ m/s} = 8.8 \text{ km/hr}$$

16. An electron moves straight inside a charged parallel plate capacitor of uniform charge density σ . The space between the plates is filled with uniform magnetic field of intensity B, as shown in the figure. Neglecting effect of gravity, the time of straight line motion of the electron in the capacitor is :



- (1) $\frac{\epsilon_0 / B}{\sigma}$ (2) $\frac{\sigma}{\epsilon_0 / B}$
(3) $\frac{\epsilon_0 B}{\sigma}$ (4) $\frac{\sigma}{\epsilon_0 B}$

Answer (1)

Sol. $V = \frac{E}{B} = \frac{\sigma}{B \epsilon_0}$

$$t = \frac{l}{V} = \frac{l B \epsilon_0}{\sigma}$$

17. Inside a parallel plate capacitor the electric field E varies with time as t^2 . The variation of induced magnetic field with time is given by :

- (1) t^2 (2) no variation
(3) t^3 (4) t

Answer (4)

Sol. $\oint \mathbf{B} \cdot d\mathbf{l} = \mu_0 I_D$

$$= A\mu_0 \epsilon_0 \frac{dE}{dt}$$

$$\Rightarrow B \times 2\pi r = \pi r^2 \mu_0 \epsilon_0 \times 2t \Rightarrow B \propto t$$

18. The volume of 1 mole of an ideal gas with the adiabatic

exponent γ is changed according to the relation $V = \frac{b}{T}$

where $b = \text{constant}$. The amount of heat absorbed by the gas in the process if the temperature is increased by ΔT will be :

(1) $\left(\frac{1-\gamma}{\gamma+1}\right)R\Delta T$ (2) $\frac{R}{\gamma-1}\Delta T$

(3) $\left(\frac{2-\gamma}{\gamma-1}\right)R\Delta T$ (4) $\frac{R\Delta T}{\gamma-1}$

Answer (3)

Sol. $V \cdot T = b$

$$VdT + TdV = 0$$

$$-\frac{VdT}{T} = dV$$

$$\Delta Q = \Delta U + W = n\epsilon \Delta T - nR\Delta T$$

$$= \frac{nR}{\gamma-1}\Delta T - nR\Delta T = \frac{nR\Delta T(2-\gamma)}{\gamma-1}$$

19. Two coherent sources of intensity ratio α interfere. The

value of $\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}}$ is :

(1) $\sqrt{\frac{\alpha}{1+\alpha}}$ (2) $\frac{2\sqrt{\alpha}}{1+\alpha}$

(3) $\frac{1+\alpha}{2\sqrt{\alpha}}$ (4) $\frac{1-\alpha}{1+\alpha}$

Answer (2)

Sol. Given $\frac{I_1}{I_2} = \alpha$; $I_{\max} = (\sqrt{I_1} + \sqrt{I_2})^2 \propto (\sqrt{\alpha} + 1)^2$

$$I_{\min} = (\sqrt{I_1} - \sqrt{I_2})^2 \propto (\sqrt{\alpha} - 1)^2$$

$$\frac{I_{\max} - I_{\min}}{I_{\max} + I_{\min}} = \frac{(\sqrt{\alpha} + 1)^2 - (\sqrt{\alpha} - 1)^2}{(\sqrt{\alpha} + 1)^2 + (\sqrt{\alpha} - 1)^2} = \frac{2\sqrt{\alpha}}{1 + \alpha}$$

20. When the temperature of a gas is raised from 30°C to 90°C , the percentage increase in the r.m.s velocity of the molecules will be :

(1) 60 % (2) 10 %

(3) 15 % (4) 30 %

Answer (2)

Sol. $v_{\text{r.m.s}} \propto \sqrt{T}$ $\frac{v_2}{v_1} = \sqrt{\frac{363}{303}} = \sqrt{1.2} = 1.1$

$$\frac{v_2}{v_1} - 1 = 1.1 - 1 = 0.1 \times 100 = 10\%$$

21. A parallel beam of light of wavelength λ is incident normally on a single slit of width d . Diffraction bands are obtained on a screen placed at a distance D from the slit. The second dark band from the central bright band will be at a distance given by :

(1) $\frac{2\lambda D}{d}$ (2) $\lambda d D$

(3) $\frac{\lambda D}{2d}$ (4) $\frac{2\lambda d}{D}$

Answer (1)

Sol. For dark fringes

$$d \sin\theta = n\lambda$$

$$d \times \frac{y}{D} = n\lambda \quad \text{or, } y = \frac{n\lambda D}{d} \quad y = \frac{2\lambda D}{d}$$

22. A thin uniform rod of mass 'M' and length 'L' is rotating about a perpendicular axis passing through its centre with a constant angular velocity ' ω '. Two objects each

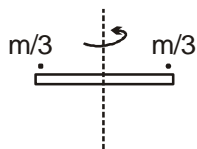
of mass $\frac{M}{3}$ are attached gently to the two ends of the

rod. The rod will now rotate with an angular velocity of :

(1) $\frac{1}{3}\omega$ (2) $\frac{1}{7}\omega$

(3) $\frac{1}{6}\omega$ (4) $\frac{1}{2}\omega$

Answer (1)



Sol.

$$L_f = L_i$$

$$\left[\frac{ML^2}{12} + \frac{M}{3} \left(\frac{L}{2} \right)^2 \times 2 \right] \times \omega' = \frac{ML^2}{12} \times \omega$$

$$\text{So, } \omega' = \omega/3$$

23. Two open organ pipes of fundamental frequencies n_1 and n_2 are joined in series. The fundamental frequency of the new pipe so obtained will be :

(1) (n_1+n_2) (2) $\frac{n_1+n_2}{2}$

(3) $\sqrt{n_1^2+n_2^2}$ (4) $\frac{n_1 n_2}{n_1+n_2}$

Answer (4)

Sol.

$$\frac{V}{2l_1} = n \quad \text{or, } l_1 = \frac{V}{2n_1} \quad \text{similarly } l_2 = \frac{V}{2n_2}$$

$$\text{Required } v = \frac{V}{2(l_1+l_2)} = \frac{V}{2\left(\frac{V}{2n_1} + \frac{V}{2n_2}\right)} = \frac{n_1 n_2}{n_1+n_2}$$

24. The density of a metal at normal pressure is ρ . Its density when it is subjected to an excess pressure p is ρ' . If B is Bulk modulus of the metal, the ratio of $\frac{\rho'}{\rho}$ is

(1) $1 + \frac{B}{\rho}$ (2) $\frac{1}{1 - \frac{p}{B}}$

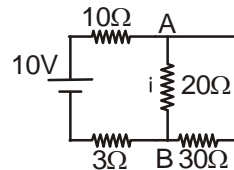
(3) $1 + \frac{p}{B}$ (4) $\frac{1}{1 + \frac{p}{B}}$

Answer (2)

$$\text{Sol. } B = \frac{\Delta p}{-\frac{\Delta v}{v}} = \frac{-\Delta p}{\frac{v_2}{v_1} - 1} = \frac{p}{1 - \frac{\rho}{\rho'}}$$

$$\therefore 1 - \frac{\rho}{\rho'} = \frac{p}{B} \quad \therefore \frac{\rho'}{\rho} = \frac{1}{1 - \frac{p}{B}}$$

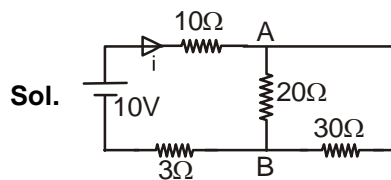
25. In the electrical circuit shown in the figure, the current i through the side AB is



(1) $\frac{6}{25}$ A (2) $\frac{10}{33}$ A

(3) $\frac{1}{5}$ A (4) $\frac{10}{63}$ A

Answer (1)



Sol.

$$i = \frac{10}{25} \text{ A} \quad \therefore i_{AB} = \frac{3}{5} \times i = \frac{6}{25} \text{ A}$$

26. If the mass of neutron is 1.7×10^{-27} kg, then the de-Broglie wavelength of neutron of energy 3eV is : ($h=6.6 \times 10^{-34}$ Js)

(1) 1.4×10^{-11} m (2) 1.6×10^{-10} m

(3) 1.65×10^{-11} m (4) 1.4×10^{-10} m

Answer (3)

$$\text{Sol. } \lambda = \frac{h}{\sqrt{2mE}} = \frac{0.286}{\sqrt{E(\text{in eV})}} \text{ \AA}$$

$$\therefore \lambda = \frac{0.286}{\sqrt{3}} \text{ \AA} = 1.65 \times 10^{-11} \text{ m}$$

27. Imagine earth to be a solid sphere of mass M and radius R . If the value of acceleration due to gravity at a depth ' d ' below earth's surface is same as its value at a height ' h ' above its surface and equal to

$\frac{g}{4}$ (where g is the value of acceleration due to gravity

on the surface of earth), the ratio of $\frac{h}{d}$ will be :

(1) 1 (2) $\frac{4}{3}$

(3) $\frac{3}{2}$ (4) $\frac{2}{3}$

Answer (2)

Sol. $g_h = g \left(\frac{R}{R+h} \right)^2 = \frac{g}{4} \Rightarrow h = R$

$g_d = g \left(1 - \frac{d}{R} \right) = \frac{g}{4} \Rightarrow d = \frac{3}{4}R \quad \therefore \frac{h}{d} = \frac{4}{3}$

28. In a certain planetary system, it is observed that one of the celestial bodies having a surface temperature of 200K, emits radiation of maximum intensity near the wavelength 12 μm. The surface temperature of a nearby star which emits light of maximum intensity at a wavelength λ = 4800Å, is :

- (1) 7500 K (2) 5000 K
(3) 2500 K (4) 10000 K

Answer (2)

Sol. $\lambda_1 T_1 = \lambda_2 T_2$

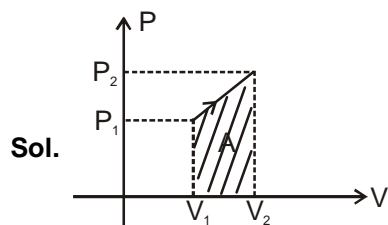
$12 \times 10^{-6} \times 200 = 4800 \times 10^{-10} \times T_2$

$T_2 = 5000K$

29. One mole of a gas obeying the equation of state $P(V-b) = RT$ is made to expand from a state with coordinates (P_1, V_1) to a state with (P_2, V_2) along a process that is depicted by a straight line on a P-V diagram. Then, the work done is given by

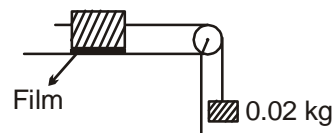
- (1) $\frac{1}{2} (P_2 - P_1)(V_2 + V_1 + 2b)$
(2) $\frac{1}{2} (P_1 + P_2)(V_2 - V_1)$
(3) $\frac{1}{2} (P_2 - P_1)(V_2 - V_1)$
(4) $\frac{1}{2} (P_1 + P_2)(V_2 - V_1 + 2b)$

Answer (2)



$w = A = \frac{1}{2} (P_1 + P_2)(V_2 - V_1)$

30. A metal block of base area 0.2m² is connected to a 0.02 kg mass via a string that passes over an ideal pulley as shown in figure. A liquid film of thickness 0.6 mm is placed between the block and the table. When released the block moves to the right with a constant speed of 0.17 m/s. The co-efficient of viscosity of the liquid is :



- (1) $3.45 \times 10^3 \text{ Pa-s}$ (2) $3.45 \times 10^{-2} \text{ Pa-s}$
(3) $3.45 \times 10^{-3} \text{ Pa-s}$ (4) $3.45 \times 10^2 \text{ Pa-s}$

Answer (3)

Sol. $mg = \eta^A \left(\frac{V}{Z} \right)$

$\therefore \eta = \frac{mgZ}{AV} = \frac{(0.02)(10)(0.6 \times 10^{-3})}{(0.2)(0.17)}$
 $= 3.45 \times 10^{-3} \text{ Pa-s}$

31. The energy liberated per nuclear fission is 200 MeV. If 10²⁰ fissions occur per second the amount of power produced will be

- (1) $2 \times 10^{22} \text{ W}$ (2) $32 \times 10^8 \text{ W}$
(3) $16 \times 10^8 \text{ W}$ (4) $5 \times 10^{11} \text{ W}$

Answer (2)

Sol. $P = \left(\frac{dN}{dt} \right) (\Delta E) = 10^{20} \times 200 \times 10^6 \times 1.6 \times 10^{-19}$
 $= 32 \times 10^8 \text{ W}$

32. A ball of mass 1 kg is thrown vertically upwards and returns to the ground after 3 seconds. Another ball, thrown at 60° with vertical also stays in air for the same time before it touches the ground. The ratio of the two heights are

- (1) 1 : 3 (2) 1 : 2
(3) 1 : 1 (4) 2 : 1

Answer (3)

Sol. As $T_1 = T_2 \Rightarrow v_y = \text{identical}$

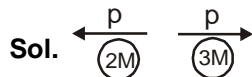
$\therefore \text{As } H = \frac{v_y^2}{2g}$

$\therefore H_1 = H_2$

33. A body initially at rest, breaks up into two pieces of masses $2M$ and $3M$ respectively, together having a total kinetic energy E . The piece of mass $2M$, after breaking up, has a kinetic energy :

- (1) $\frac{2E}{5}$ (2) $\frac{E}{2}$
 (3) $\frac{E}{5}$ (4) $\frac{3E}{5}$

Answer (4)



$$KE \propto \frac{1}{\text{mass}} \quad [\because p = \text{constant}]$$

$$\therefore KE_{2M} = \frac{3}{5}E$$

34. A light beam is incident on a denser medium whose refractive index is 1.414 at an angle of incidence 45° . Find the ratio of width of refracted beam in a medium to the width of the incident beam in air.

- (1) $\sqrt{3} : \sqrt{2}$ (2) $1 : \sqrt{2}$
 (3) $\sqrt{2} : 1$ (4) $\sqrt{2} : \sqrt{3}$

Answer (1)

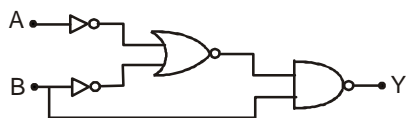
Sol. $1 \sin 45^\circ = \sqrt{2} \sin \theta_{\text{med}}$

$$\therefore \theta_{\text{med}} = 30^\circ$$

$$\therefore \frac{d_{\text{med}}}{\cos \theta_{\text{med}}} = \frac{d_{\text{air}}}{\cos \theta_{\text{air}}}$$

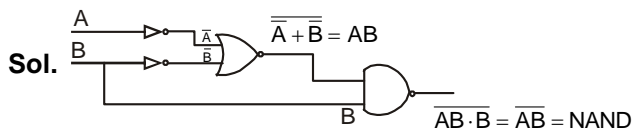
$$\therefore \frac{d_{\text{med}}}{d_{\text{air}}} = \frac{\cos 30^\circ}{\cos 45^\circ} = \frac{\sqrt{3}}{\sqrt{2}}$$

35. From the circuit of the following Logic gates, the basic logic gate obtained is :

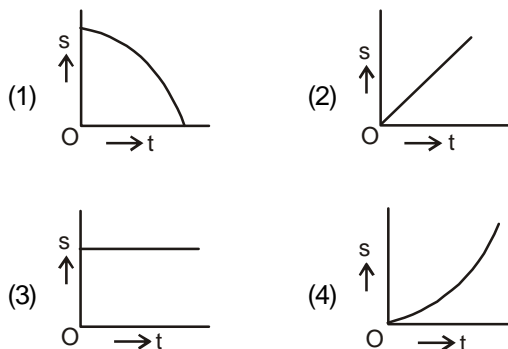


- (1) NAND gate (2) AND gate
 (3) OR gate (4) NOT gate

Answer (1)



36. A body starts moving unidirectionally under the influence of a source of constant power. Which one of the graph correctly shows the variation of displacement(s) with time (t) ?



Answer (4)

Sol. $P = \frac{\frac{1}{2}mv^2}{t} \Rightarrow v \propto \sqrt{t}$

\therefore velocity increases with time

\therefore slope of s-t graph should increase

37. In an experiment of photoelectric effect the stopping potential was measured to be V_1 and V_2 with incident light of wavelength λ and $\lambda/2$, respectively. The relation between V_1 and V_2 is

- (1) $V_2 > 2V_1$ (2) $V_2 < V_1$
 (3) $V_1 < V_2 < 2V_1$ (4) $V_2 = 2V_1$

Answer (1)

Sol. $\frac{hc}{\lambda} = \phi + eV_1$

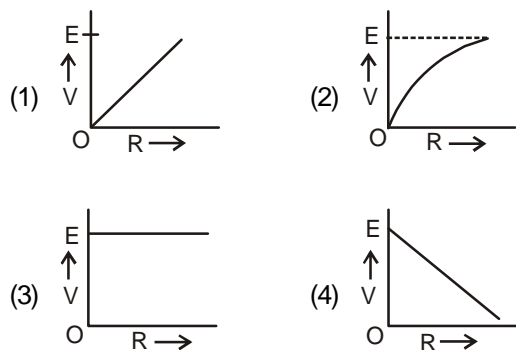
$$\frac{2hc}{\lambda} = \phi + eV_2$$

$$\therefore 2\phi + 2eV_1 = \phi + eV_2$$

$$\therefore V_2 = 2V_1 + \frac{\phi}{e}$$

$$\therefore V_2 > 2V_1$$

38. A cell of emf E and internal resistance ' r ' is connected to a variable external resistor ' R '. The graph which gives the terminal voltage of cell ' V ' with respect to R is

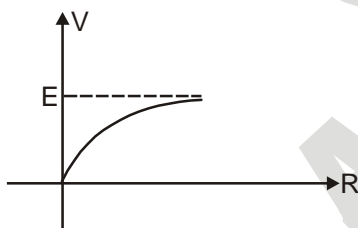


Answer (2)

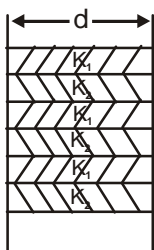
Sol. $V = \left(\frac{E}{R+r} \right) R = \frac{E}{\left(1 + \frac{r}{R} \right)}$

\therefore as $R \rightarrow 0 \Rightarrow V \rightarrow 0$

$R \rightarrow \infty \Rightarrow V \rightarrow E$



39. A wall consists of alternating blocks of length ' d ' and coefficient of thermal conductivity K_1 and K_2 respectively as shown in figure. The cross sectional area of the blocks are the same. The equivalent coefficient of thermal conductivity of the wall between left and right is :



- (1) $\frac{K_1 + K_2}{2}$
- (2) $\frac{2K_1 K_2}{K_1 + K_2}$
- (3) $\frac{K_1 + K_2}{3}$
- (4) $\frac{3K_1 K_2}{K_1 + K_2}$

Answer (1)

Sol. As all are in parallel

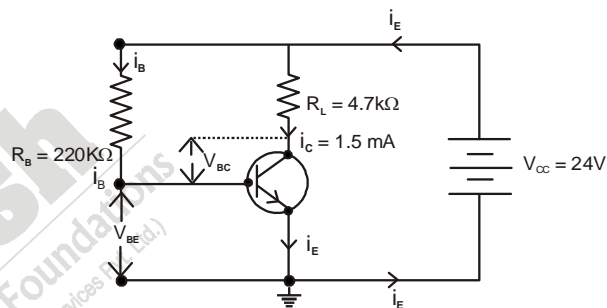
Let area of each blocks be A

$\therefore C_{eq} = 3(C_1 + C_2)$

$\Rightarrow K_{eq} \frac{\epsilon_0 (6A)}{d} = 3 \left(\frac{K_1 \epsilon_0 A}{d} + \frac{K_2 \epsilon_0 A}{d} \right)$

$\therefore K_{eq} = \frac{K_1 + K_2}{2}$

40. A common emitter amplifier circuit is shown in the figure below. For the transistor used in the circuit the current amplification factor, $\beta_{dc} = 100$. Other parameters are mentioned in the figure.



We find that :

- (1) $V_{BE} = +18.2V$, $V_{BC} = -3.45 V$ and amplifier is working
- (2) $V_{BE} = +18.5 V$, $V_{BC} = +2.85 V$ and amplifier is not working
- (3) $V_{BE} = +20.7 V$, $V_{BC} = +3.75 V$ and amplifier is not working
- (4) $V_{BE} = +21.5 V$, $V_{BC} = -2.75 V$ and amplifier is working

Answer (3)

Sol. $V_{BE} = V_{CC} - I_B R_B$

$R_B = 24 - 15 \times \frac{1.5 \times 10^{-3}}{100} \times 220 \times 10^3 = 20.7 V$

$V_{CE} = V_{CC} - I_C R_C$

$R_C = 24 - 1.5 \times 10^{-3} \times 4.7 \times 10^3 = 16.95 V$

$\therefore V_{BC} = V_{BE} - V_{CE} = 3.75 V$

41. The angle between $\vec{A} - \vec{B}$ and $\vec{A} \times \vec{B}$ is ($\vec{A} \neq \vec{B}$):

- (1) 60° (2) 90°
(3) 120° (4) 45°

Answer (2)

Sol. $(\vec{A} - \vec{B}) \Rightarrow$ in the plane of \vec{A} and \vec{B}

$(\vec{A} \times \vec{B}) \Rightarrow$ perpendicular to plane of \vec{A} and \vec{B}

$\therefore (\vec{A} - \vec{B})$ perpendicular to $(\vec{A} \times \vec{B})$

42. A satellite of mass m is in circular orbit of radius $3 R_E$ about earth (mass of earth M_E , radius of earth R_E). How much additional energy is required to transfer the satellite to an orbit of radius $9 R_E$?

- (1) $\frac{GM_E m}{3R_E}$ (2) $\frac{GM_E m}{18R_E}$
(3) $\frac{3GM_E m}{2R_E}$ (4) $\frac{GM_E m}{9R_E}$

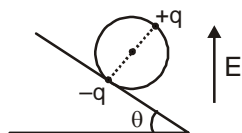
Answer (4)

Sol. $\Delta E = TE_2 - TE_1$

$$= -\frac{GmM_e}{2(9R_E)} + \frac{GmM_e}{2(3R_E)}$$

$$= \frac{GmM_e}{9R_E}$$

43. A wheel having mass m has charges $+q$ and $-q$ on diametrically opposite points. It remains in equilibrium on a rough inclined plane in the presence of a vertical electric field E . Then value of E is :



- (1) $\frac{mg \tan \theta}{q}$ (2) $\frac{mg}{q}$
(3) $\frac{mg}{2q}$ (4) $\frac{mg \tan \theta}{2q}$

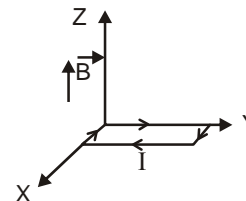
Answer (3)

Sol. $\tau_E = \tau_{\text{gravity}}$

$$\Rightarrow q(2R) E \sin \theta = mg \sin \theta \cdot R$$

$$\therefore E = \frac{mg}{2q}$$

44. A uniform magnetic field of 0.3 T is established along the positive Z-direction. A rectangular loop in XY plane of sides 10 cm and 5 cm carries a current of $I = 12$ A as shown. The torque on the loop is :



- (1) $+1.8 \times 10^{-2} \hat{i}$ NM (2) $-1.8 \times 10^{-2} \hat{j}$ NM
(3) Zero (4) $-1.8 \times 10^{-2} \hat{i}$ NM

Answer (3)

Sol. \vec{M} is parallel to \vec{B}

$$\therefore \vec{M} \times \vec{B} = 0$$

45. The rotational kinetic energy of a solid sphere of mass 3 kg and radius 0.2 m rolling down an inclined plane of height 7 m is :

- (1) 42 J (2) 60 J
(3) 36 J (4) 70 J

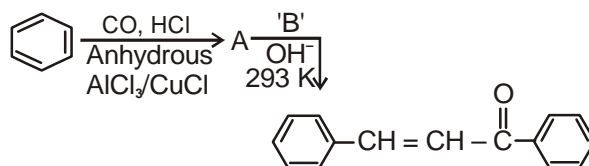
Answer (2)

$$\text{Sol. } mgh = \frac{1}{2} \left(\frac{7}{5} mR^2 \right) \omega^2$$

$$\therefore KE_{\text{rot}} = \frac{1}{2} \left(\frac{2}{5} mR^2 \right) \omega^2 = \frac{2}{7} mgh$$

$$= \frac{2}{7} \times 3 \times 10 \times 7 = 60 \text{ J}$$

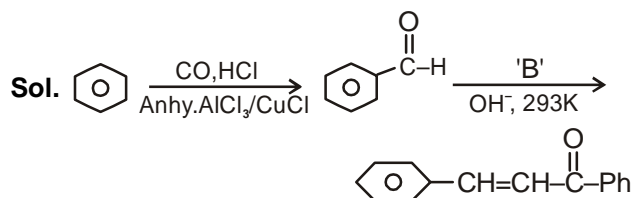
46. Consider the following sequence of reactions :



The substance 'B' is

- (1) Acetone (2) Benzene
(3) Acetophenone (4) Benzaldehyde

Answer (3)



'B' must be 'acetophenone' gives "crossed Aldol condensation"

47. Toluene in the vapour phase is in equilibrium with a solution of benzene and toluene having mole fraction of toluene 0.50. If vapour pressure of pure benzene is 119 torr and that of toluene is 37.0 torr at the same temperature, mole fraction of toluene in vapour phase will be :

- (1) 0.325 (2) 0.462
(3) 0.237 (4) 0.506

Answer (3)

Sol. $P_t^\circ = 37$ torr

$$P_b^\circ = 119 \text{ torr} \quad y_t = \frac{P_t^\circ x_t}{P_t^\circ x_t + P_b^\circ x_b}$$

$$x_t = 0.5 \quad = \frac{37 \times 0.5}{37 \times 0.5 + 119 \times 0.5}$$

$$= \frac{37}{37 + 119} = 0.237$$

48. Among halogens, the one which can oxidise water to oxygen is :

- (1) iodine (2) chlorine
(3) bromine (4) fluorine

Answer (4)

Sol. $2F_2 + 2H_2O \rightarrow 4HF + O_2$

49. The reaction : $ArN_2Cl \xrightarrow{Cu/HCl} ArCl + N_2$ is known as

- (1) Balz Schiemann reaction
(2) Sandmeyer reaction
(3) Finkelstein reaction
(4) Gattermann reaction

Answer (4)

Sol. $Ar-N_2^+Cl^- \xrightarrow{Cu/HCl} Ar-Cl + N_2$
It is gattermann reaction

50. Amongst the following compounds the one which is most easily sulphonated is

- (1) Chlorobenzene (2) Benzene
(3) Nitro benzene (4) Toluene

Answer (4)

Sol. Toluene is easily sulphonated as

$-CH_3$ is activating group

51. The standard equilibrium constant, K_p at 298 K for the reaction, $N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$ is 5.8×10^5 .

The value of standard equilibrium constant, if the concentration of gases is expressed in terms of mol/L, will be :

[Given : $R = 0.08314 \text{ L bar K}^{-1} \text{ mol}^{-1}$]

- (1) 3.99×10^9 (2) 3.51×10^6
(3) 3.84×10^7 (4) 3.56×10^8

Answer (4)

Sol. $K_p = K_c(RT)^{\Delta ng}$

$$\therefore K_c = \frac{K_p}{(RT)^{\Delta ng}} = \frac{5.8 \times 10^5}{(0.08314 \times 298)^{2-4}} = \frac{5.8 \times 10^5}{(0.08314 \times 298)^{-2}}$$

$$= 3.56 \times 10^8$$

52. Which one of the following ions is not tetrahedral in shape ?

- (1) $[NiCl_4]^{2-}$ (2) NH_4^+
(3) BF_4^- (4) $[Cu(NH_3)_4]^{2+}$

Answer (4)

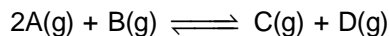
Sol. $[Cu(NH_3)_4]^{2+}$ is a square planar complex

53. The letter 'D' in D-glucose signifies :

- (1) configuration at the penultimate Chiral Carbon
(2) configuration at all Chiral Carbons
(3) dextrorotatory
(4) that it is a monosaccharide

Answer (1)

54. Consider the following reaction for which the change in enthalpy is positive



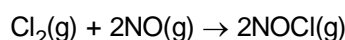
Which of the following will not affect the equilibrium ?

- (1) Presence of catalyst
- (2) Change in concentration of reactants
- (3) Change in pressure
- (4) Change in temperature

Answer (1)

Sol. Presence of catalyst does not alter equilibrium

55. Consider the reaction between chlorine and nitric oxide



On doubling the concentration of both reactants, the rate of the reaction increases by a factor of 8. However, if only the concentration of Cl_2 is doubled, the rate increases by a factor of 2. The order of this reaction with respect to NO is :

- (1) 3
- (2) 0
- (3) 1
- (4) 2

Answer (4)

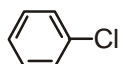
Sol. rate law is

$$r = K[Cl_2]^1 [NO]^2$$

Hence order of reaction = 1+2=3

∴ O.R. with respect to NO = 2

56. Which of the following will react faster through S_N1 mechanism ?

- (1) CH_3CH_2Cl
- (2) $H_2C = CH - CH_2Cl$
- (3) 
- (4) $CH_2 = CHCl$

Answer (2)

Sol. As $CH_2 = CH - \overset{\oplus}{C}H_2$ is highly stable due to resonance

57. The correct statement regarding ethane conformation is :

- (1) Rotation around carbon-carbon bond in ethane molecule is not possible, because ethane molecule contains both sigma(σ) bond and pi(π) bond between the carbon and carbon and ethane has very high boiling point.

- (2) Rotation around carbon-carbon bond in ethane molecule is not possible, because ethane molecule contains a pi(π) bond between the carbon and carbon and ethane has very low melting point.
- (3) Rotation around carbon-carbon bond in ethane molecule is not possible, because ethane molecule contains both sigma(σ) bond and pi(π) bond between the carbon and carbon.
- (4) Rotation around carbon-carbon bond in ethane molecule is possible because of cylindrical symmetry of sigma(σ) bond between carbon-carbon atoms.

Answer (4)

Sol. Ethane doesn't have π bond

58. Which of the following lanthanoids shows +4 oxidation state to acquire noble gas configuration ?

(At nos. : La = 57, Ce = 58, Eu = 63 and Yb = 70)

- (1) Eu
- (2) Ce
- (3) Yb
- (4) La

Answer (2)

Sol. Ce, Pr have +4 oxidation state

59. The tendency to form monovalent compounds among the Group 13 elements is correctly exhibited in :

- (1) $B \approx Al \approx Ga \approx In \approx Tl$
- (2) $B < Al < Ga < In < Tl$
- (3) $Tl < In < Ga < Al < B$
- (4) $Tl \approx In < Ga < Al < B$

Answer (2)

Sol. +1 oxidation state stability increases down the group due to inert pair effect

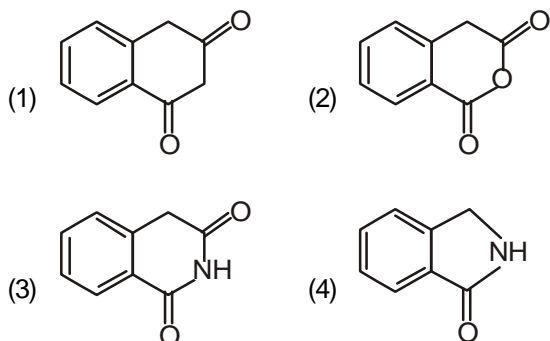
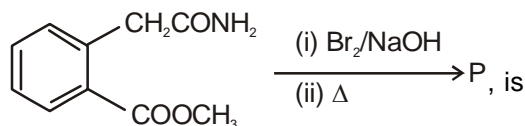
60. Which of the following complex ions is not diamagnetic ?

- (1) $[Sc(H_2O)_3(NH_3)_3]^{3+}$
- (2) $[Ti(en)_2(NH_3)_2]^{4+}$
- (3) $[Cr(NH_3)_6]^{3+}$
- (4) $[Zn(NH_3)_6]^{2+}$

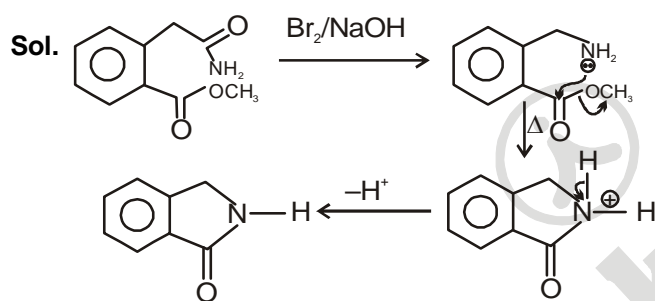
Answer (3)

Sol. Cr^{+3} have d^3 , so paramagnetic

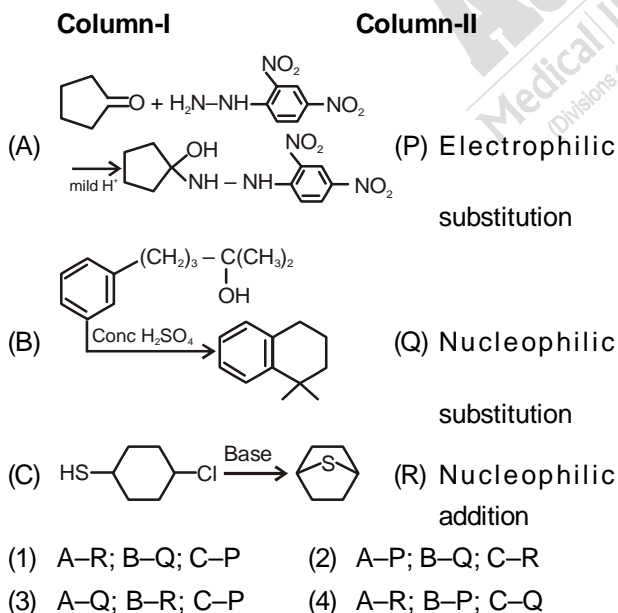
61. The product (P) of the following reaction



Answer (4)



62. Match Column-I with Column-II:



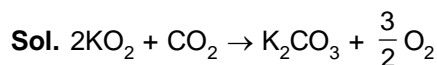
Answer (4)

Sol. Fact

63. Which of the following absorbs carbon dioxide and releases oxygen?

- (1) K_2O (2) CaO
(3) KO_2 (4) KOH

Answer (3)



64. Of the following, the largest value of entropy at 25°C and 1 atm is that of

- (1) CH_4 (2) H_2
(3) C_2H_6 (4) C_2H_2

Answer (3)

Sol. More number of bonds

65. Which of the following pairs shows highest bond dissociation enthalpy among halogens and lowest bond dissociation enthalpy among hydrogen halides?

- (1) I_2, HI (2) F_2, HF
(3) Cl_2, HCl (4) Br_2, HBr

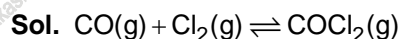
Answer (No option correct)



66. For the reaction $\text{CO}(\text{g}) + \text{Cl}_2(\text{g}) \rightleftharpoons \text{COCl}_2(\text{g})$, $\frac{K_p}{K_c}$ is equal to

- (1) $(RT)^2$ (2) $\frac{1}{RT}$
(3) RT (4) \sqrt{RT}

Answer (2)



$$\Delta n_g = -1$$

$$K_p = K_c (RT)^{\Delta n_g}$$

$$\frac{K_p}{K_c} = \frac{1}{RT}$$

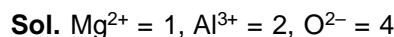
67. A compound formed by Mg, Al and O, is found to have cubic close array of oxide ions in which Mg^{2+}

occupying $\frac{1}{8}$ th of tetrahedral voids and Al^{3+} ions

occupying $\frac{1}{2}$ the octahedral voids. The formula for the compound is

- (1) MgAlO (2) MgAl_4O_2
(3) $\text{Mg}_2\text{Al}_3\text{O}_2$ (4) MgAl_2O_4

Answer (4)



68. Which of these artificial sweetener is unstable at cooking temperature?

- (1) Saccharin (2) Aspartame
(3) Alitame (4) Sucralose

Answer (2)

Sol. As per NCERT

69. Strong reducing behaviour of H_3PO_2 is due to

- (1) Low coordination number of P
(2) Low oxidation state of P
(3) Presence of one $-OH$ group and two $P-H$ bonds
(4) Presence of two $-OH$ groups and one $P-H$ bonds

Answer (3)

70. For the tetrahedral complex $[MnBr_4]^{2-}$, the spin only magnetic moment value is

[At. no. of Mn = 25]

- (1) 2.4 (2) 1.7
(3) 5.9 (4) 4.8

Answer (3)

Sol. $Mn^{+2} = [Ar]^{18} 3d^5 4s^0 \therefore [MnBr_4]^{2-}$ is tetrahedral complex

$$\begin{aligned} \boxed{1111} t_2 & \quad n=5 \\ \mu &= \sqrt{n(n+2)} \\ \boxed{111} t & \quad = \sqrt{5(5+2)} \\ & \quad = \sqrt{35} = 5.9 \end{aligned}$$

71. The total number of orbitals present for principle quantum number, $n = 4$ is

- (1) 30 (2) 12
(3) 15 (4) 16

Answer (4)

Sol	Subshell	No. of orbital
	s	1
	p	3
	d	5
	f	7

\therefore Total = 16

72. Under isothermal and reversible conditions, the term "free energy" in thermodynamics signifies

- (1) Expansion work done on the system
(2) Non-expansion work done by the system

(3) Expansion work done by the system

(4) Non-expansion work done on the system

Answer (2)

Sol. $-\Delta G_{\text{system}} = W_{\text{non-expansion}}$

73. Which of the following statements is incorrect?

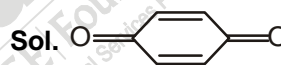
- (1) Lyophilic sols are more stable than lyophobic sols
(2) In coagulation of a negative sol, flocculating power is in the order of $Al^{3+} > Ba^{2+} > Na^+$
(3) In the flocculation of a positive sol, flocculating power is in the order, $Cl^- > SO_4^{2-} > PO_4^{3-} > [Fe(CN)_6]^{4-}$
(4) Lyophilic colloids have greater affinity for solvents

Answer (3)

74. The oxidation of phenol with chromic acid gives

- (1) An aldehyde
(2) A simple diketone
(3) A Conjugated diketone
(4) Ortho benzoquinone

Answer (3)



conjugated diketone

75. For the reaction, $XA + YB \rightarrow ZC$, if

$\frac{-d[A]}{dt} = \frac{-d[B]}{dt} = \frac{1.5d[C]}{dt}$, then the correct statement among the following is

- (1) The value of $Y = 2$
(2) The value of $X = Y = Z = 3$
(3) The value of $X = Y = 3$
(4) The value of $X = 2$

Answer (3)

Sol. $\frac{-d[A]}{dt} = \frac{-d[B]}{dt} = \frac{1.5d[C]}{dt} \dots\dots(1)$

For the reaction,



$$\frac{-d[A]}{Xdt} = \frac{-d[B]}{Ydt} = \frac{d[C]}{Zdt} \dots\dots(2)$$

On comparing (1) and (2)

$$X : Y : Z = 1 : 1 : \frac{1}{1.5}$$

$$= 1 : 1 : \frac{2}{3}$$

$$= 3 : 3 : 2$$

$$X = Y = 3, Z = 2$$

76. Given that $\wedge_m^\alpha = 133.4$ (AgNO₃);

$\wedge_m^\alpha = 149.9$ (KCl); $\wedge_m^\alpha = 144.9$ S cm² mol⁻¹ (KNO₃);
the molar conductivity at infinite dilution for AgCl is

(1) 132 S cm² mol⁻¹ (2) 140 S cm² mol⁻¹

(3) 138 S cm² mol⁻¹ (4) 134 S cm² mol⁻¹

Answer (3)

Sol. \wedge_m^∞ (AgCl) = \wedge_m^∞ (AgNO₃) + \wedge^∞ (KCl) - \wedge^∞ (KNO₃)

$$= (133.4 + 149 - 144.9) \text{ S cm}^2$$

$$= 138.4 \text{ S cm}^2$$

77. Which of the following statements is incorrect?

(1) Of $\bar{\text{O}}-\text{C}\equiv\bar{\text{O}}, \text{O}=\text{C}=\text{O}$, the structures,

$\bar{\text{O}}-\text{C}\equiv\bar{\text{O}}$ is most stable structure

(2) The bond angle follows the order CH₄ > NH₃ > H₂O > H₂S

(3) The bond order follows the order O₂⁺ > O₂ > O₂⁻ > O₂²⁻

(4) Strength of 'H' bond follows the order HF > H₂O > NH₃ > HCl

Answer (1)

Sol. $\bar{\text{O}}-\text{C}\equiv\bar{\text{O}}$ is less stable than O = C = O
(Charge separation) (Neutral)

78. Among the following acids, the strongest acid is

(1) Cl₃CCOOH (2) NCCH₂COOH

(3) O₂NCH₂COOH (4) F₃CCOOH

Answer (4)

Sol. -CF₃ is the strongest electron withdrawing group

79. The electron distribution in dⁿ coordination complexes depends on magnitude of crystal field splitting, (Δ₀) and pairing energy (P). The condition which favours formation of high spin complexes is

(1) t_{2g}⁴e_g⁰ (2) Δ₀ > P

(3) Δ₀ < P (4) Δ₀ = P

Answer (3)

80. Match the polymer in **Column-I** to the monomer from **Column-II** and assign the **correct** code

Column-I (Polymer)	Column-II (Monomer)
(a) Nylon-6	(i) ethylene glycol, terephthalic acid
(b) Dacron	(ii) urea, formaldehyde
(c) Glyptal	(iii) ethylene glycol, phthalic acid
(d) Novolac	(iv) Phenol, formaldehyde
	(v) Caprolactum

Code:

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

Answer (2)

81. The [Co(H₂O)₆]²⁺ ion has three unpaired electrons. The hybridization of Co in [Co(H₂O)₆]²⁺ is

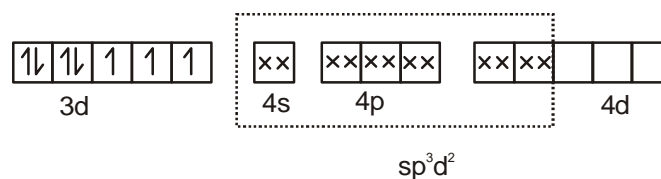
(1) d²sp³ (2) sp³

(3) dsp² (4) sp³d²

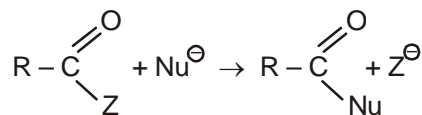
Answer (4)

Sol. $\left[\text{Co}(\text{H}_2\text{O})_6 \right]^{2+}$, N = 3 unpaired electrons
d⁷

Co²⁺ : [18Ar]3d⁷



82. If the rate of the reaction

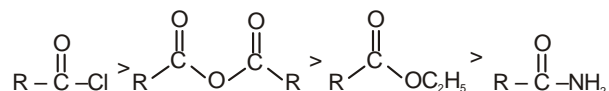


is fastest, then Z is

- (1) $OCOCH_3$ (2) Cl
(3) NH_2 (4) OC_2H_5

Answer (2)

Sol. Reactivity order during nucleophilic acyl substitution,



83. Depressant used in the concentration of an ore containing ZnS and PbS is

- (1) Na_2SO_4 (2) Na_2CO_3
(3) NaCl (4) NaCN

Answer (4)

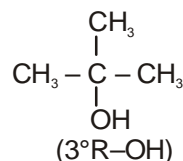
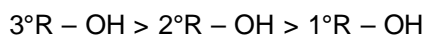
Sol. NaCN is used as depressant

84. Of the following alcohols, the one that would react fastest with conc. HCl and anhydrous $ZnCl_2$ is

- (1) 2-methylpropanol (2) Butan-1-ol
(3) Butan-2-ol (4) 2-methylpropan-2-ol

Answer (4)

Sol. Reactivity of alcohol with Lucas Reagent



85. A hydrocarbon contains 85.7% C. If 42 mg of the compound contains 3.01×10^{20} molecules, the molecular formula of the compound will be

- (1) C_2H_4 (2) C_3H_6
(3) C_6H_{12} (4) $C_{12}H_{24}$

Answer (3)

	%	Moles	Relative mol
C	85.7	$(85.7/12)=7.14$	1
H	14.3	$(14.3/1)=14.3$	2

Sol.

Hence, Empirical Formula = CH_2 , Empirical Weight = 14

$$\frac{3.01 \times 10^{20}}{6.02 \times 10^{23}} = \text{No. of mol of molecule} = \frac{42 \times 10^{-3}}{M}$$

$$\frac{1}{2} \times 10^{-3} = \frac{42 \times 10^{-3}}{M}$$

$M = 84$ i.e. Molecular weight = 84 g/mol

$$\therefore \text{Atomicity} = \frac{84}{14} = 6$$

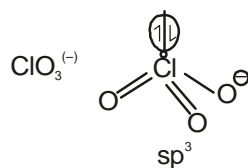
\therefore Molecular formula = C_6H_{12}

86. Which of the following pair of species is not iso-structural?

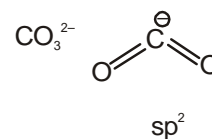
- (1) BrO_3^- , XeO_3 (2) ICl_4^- , XeF_4
(3) ClO_3^- , CO_3^{2-} (4) IBr_2^- , XeF_2

Answer (3)

Sol. ClO_3^- and CO_3^{2-} are not iso-structural



Tetrahedral geometry
pyramidal shape



Trigonal planar

87. For dry cleaning of clothes instead of tetrachloroethane which is carcinogen in nature, which of the following solvents can be used?

- (1) Petrol (2) Liquid CO_2
(3) H_2O_2 (4) Liquid O_3

Answer (1)

Sol. Petrol

88. The zinc/silver oxide cell is used in electric watches. The reaction is as following,
 $Zn^{2+} + 2e^- \rightarrow Zn$; $E^0 = -0.760\text{ V}$
 $Ag_2O + H_2O + 2e^- \rightarrow 2Ag + 2OH^-$; $E^0 = 0.344\text{ V}$
 If F is $96,500\text{ C mol}^{-1}$, ΔG^0 of the cell will be
 (1) $413.021\text{ kJ mol}^{-1}$ (2) $113.072\text{ kJ mol}^{-1}$
 (3) $213.072\text{ kJ mol}^{-1}$ (4) $313.082\text{ kJ mol}^{-1}$

Answer (3)

Sol. $Zn^{2+} + 2e^- \rightarrow Zn$, $E^0 = -0.760\text{ V}$
 $Ag_2O + H_2O + 2e^- \rightarrow 2Ag + 2OH^-$, $E^0 = +0.344\text{ V}$
 Both are reduction potential

As, $E^0_{Ag_2O/2Ag} > E^0_{Zn^{2+}/Zn}$

\therefore Cell reaction will be

At Anode: $Zn \longrightarrow Zn^{2+} + 2e^-$, $E^0 = +0.760\text{ V}$
 At Cathode: $Ag_2O + H_2O + 2e^- \longrightarrow 2Ag + 2OH^-$, $E^0 = +0.344\text{ V}$

Cell reaction: $Zn + Ag_2O + H_2O \longrightarrow Zn^{2+} + 2Ag + 2OH^-$

$n = 2$, $E^0_{cell} = 1.104\text{ V}$

$\therefore \Delta G^0 = -nFE^0_{cell}$

$\Delta G^0 = -2 \times 96500 \times 1.10$

$= -213072\text{ J/mol}$

$= -213.072\text{ kJ/mol}$

$|\Delta G^0| = 213.072\text{ kJ/mol}$

89. Which of the following hydrides has the largest bond angle?
 (1) H_2Se (2) H_2S
 (3) H_2Te (4) H_2O

Answer (4)

Sol. Bond angle $H_2O - 104.5^\circ$

$H_2S - 92^\circ$

$H_2Se - 91^\circ$

$H_2Te - 90^\circ$

\therefore Maximum bond angle is of H_2O

90. Which of the following amino acid is **not** optically active?
 (1) Glycine (2) Proline
 (3) Serine (4) Leucine

Answer (1)

Sol. Glycine is not optically active as it does not have chiral carbon ($H_2N - CH_2 - COOH$)

91. Which statement is wrong about photorespiration?
 (1) RuBP binds with O_2 to form two molecules of phosphoglycolate
 (2) Photorespiration occurs in C_3 plants and not C_4 plants
 (3) There is no synthesis of ATP or NADPH
 (4) RuBisCO has higher affinity for CO_2 than O_2

Answer (1)

92. Select the wrong statement:
 (1) Chromosomal Theory of Inheritance was proposed by Sutton
 (2) Law of Dominance and Law Independent Assortment were proposed by Mendel.
 (3) Linkage and recombination were discovered by Sutton
 (4) Three scientists independently rediscovered the Mendel's laws in 1900

Answer (3)

93. Which of the following is not a ciliary movement?
 (1) Food gathering in Paramecium
 (2) Removal of dust particles in trachea
 (3) Passage of ova through female reproductive tract
 (4) Movement of macrophages and leucocytes

Answer (4)

94. The correct sequence of involvement of cell organelles in secretion of proteins from the cell is:
 (1) Nucleus \rightarrow Endoplasmic reticulum \rightarrow Ribosomes \rightarrow Golgi apparatus \rightarrow Secretory vesicles \rightarrow Plasma membrane
 (2) Nucleus \rightarrow Ribosomes \rightarrow Endoplasmic reticulum \rightarrow Golgi apparatus \rightarrow Secretory vesicles \rightarrow Plasma membrane
 (3) Nucleus \rightarrow Ribosomes \rightarrow Endoplasmic reticulum \rightarrow Lysosomes \rightarrow Plasma membrane
 (4) Nucleus \rightarrow Endoplasmic reticulum \rightarrow Ribosomes \rightarrow Golgi apparatus \rightarrow Lysosomes \rightarrow Plasma membrane

Answer (2)

95. Continental drift led to disappearance of a number of South American mammals because:
- (1) Alteration of vegetation was not conducive to their survival
 - (2) There was an outbreak of a number of infectious diseases
 - (3) Sudden change in the climatic conditions
 - (4) They were outcompeted by more highly evolved animals reaching here from North America

Answer (4)

96. Opposite type of phyllotaxy is not present in:
- (1) Mango
 - (2) Guava
 - (3) *Calotropis*
 - (4) Mint

Answer (1)

97. The Pacinian corpuscle responds to rapid changes in:
- (1) Light intensity
 - (2) Gravity
 - (3) Pressure
 - (4) Temperature

Answer (3)

98. Thymosin is responsible for:
- (1) Decreased production of T-lymphocytes
 - (2) Inhibiting the production of antibodies
 - (3) Decreasing the blood calcium level in old individuals
 - (4) Increased production of T-lymphocytes

Answer (4)

99. Which of the following type of muscle fibres will be the first one to undergo fatigue?
- (1) Aerobic fibres
 - (2) Slow oxidative fibres
 - (3) Fast oxidative-glycolytic fibres
 - (4) Fast glycolytic fibres

Answer (4)

100. Tree planting helps reduce global warming as trees:
- (1) Can respire in light
 - (2) Give out O₂
 - (3) Create shade thereby cooling the ground
 - (4) Can sequester CO₂

Answer (4)

101. To protect and improve the quality of environment, the Government of India passed the Environment (Protection) Act in the year:
- (1) 1968
 - (2) 1953
 - (3) 1923
 - (4) 1986

Answer (4)

102. Which technique helps to identify a bacterial or viral pathogen in a human body even when its concentration is very low and clinical symptoms are not yet visible?
- (1) Differential leucocyte count
 - (2) ELISA
 - (3) Total leucocyte count
 - (4) PCR

Answer (4)

103. Which of the following represents correct match of feature with the given set of animals?

Feature	Animals
(1) Metameric segmentation	– Earthworm, Leech, Liver fluke
(2) Respiratory system	– Cockroach, Tapeworm, Starfish
(3) Bilateral symmetry	– Hydra, Tapeworm, Sea urchin
(4) Jointed appendages	– Prawn, Centipede, Grasshopper

Answer (4)

104. Matche Column-I with Column-II and select the correct option using codes given below.

Column-I	Column-II
(1) Cytokinin	(i) stimulates closure of stomata
(2) Ethylene	(ii) increases stem length
(3) Gibberellin	(iii) promotes lateral shoot growth
(4) Abscisic acid	(iv) found in large amount in tissues undergoing senescence

Codes:

(1)	(2)	(3)	(4)
(1) (iii)	(iv)	(ii)	(i)
(2) (iii)	(ii)	(iv)	(i)
(3) (iv)	(i)	(iii)	(ii)
(4) (ii)	(iv)	(i)	(iii)

Answer (1)

105. Which one of the following is not an IUD?

- | | |
|-------------------|------------------|
| (1) Vaults | (2) Cu T |
| (3) Multiload 375 | (4) Progestasert |

Answer (1)

106. The hollow foliar structure in a wheat embryo that encloses the shoot apex and a few leaf primordia is called:

- | | |
|----------------|-----------------|
| (1) Coleoptile | (2) Coleorrhiza |
| (3) Epicotyl | (4) Hypocotyl |

Answer (1)

107. Which of the following statements is correct with respect to cell cycle?

- (1) DNA content of cell remains constant during entire cell cycle
- (2) A cell in G₁ phase has double the amount of DNA than a cell in G₂ phase
- (3) Each chromosome has two chromatids in G₁ phase
- (4) Nerve cells in adult human are in G₀ state

Answer (4)

108. Select the correct option:

- (1) IUI can help a woman with premature menopause to bear a child
- (2) GIFT involves IVF to help women who cannot produce ovum to bear a child
- (3) ZIFT involves IVF to help women who cannot produce ovum to bear a child.
- (4) ZIFT involves IVF to help women who have damaged Fallopian tubes to bear a child

Answer (3)

109. A fat molecule is formed from:

- (1) Three glycerol molecules and one fatty acid molecule
- (2) One glycerol molecule and one fatty acid molecule
- (3) Three glycerol molecules and three fatty acid molecules.
- (4) One glycerol molecule and three fatty acid molecules

Answer (4)

110. Restriction endonucleases are:

- (1) Used in genetic engineering for ligating two DNA molecules
- (2) Used for in vitro DNA synthesis
- (3) Synthesized by bacteria as part of their defense mechanism
- (4) Present in mammalian cell for degradation of DNA when the cell dies

Answer (3)

111. In Lactational amenorrhoea, ovulation does not occur during the period of intense lactation because of:

- (1) High level of FSH and LH
- (2) Surge of Estrogen
- (3) Stimulation of GnRH
- (4) High level of Prolactin

Answer (4)

112. Choose the false statement regarding *Petromyzon*

- (1) The circulatory system is closed
- (2) The body is devoid of scales
- (3) Mouth is circular and lacks jaws
- (4) It migrates to the ocean for spawning

Answer (4)

113. Select wrong statement:

- (1) DNA stores genetic information
- (2) There is now enough evidence that essential processes like metabolism, translation and splicing evolved around RNA
- (3) DNA may act as a catalyst
- (4) RNA can splice itself and is also able to act as a catalyst

Answer (3)

	Substance	Glomerular Filtrate	Reabsorbed	Urine
(i)	Proteins	2g	1.9g	0.1g
(ii)	Glucose	162g	162g	0g
(iii)	Urea	54g	24g	30g
(iv)	Creatinine	1.6g	0g	1.7g

114.

- (a) Glucose is completely reabsorbed
- (b) Urea is partially reabsorbed
- (c) Proteins are secreted into urine
- (d) Creatinine is secreted into urine

Answer (4)

Which of the following options, in view of above statements is correct?

- (1) (a), (c) and (d)
- (2) (a), (b) and (c)
- (3) (b), (c) and (d)
- (4) (a), (b) and (d)

115. Identify and select the wrong statement out of the following:

- (1) In conifers the needle like leaves are well adapted to extremes of temperature, moisture conservation and onslaught of wind.
- (2) Roots of pines enter into a symbiotic relationship with higher fungi.
- (3) The coralloid roots in *Cycas* have nitrogen fixing cyanobacteria
- (4) The giant redwood tree *Sequoia*, one of the tallest trees is an angiosperm.

Answer (4)

116. Air pollution can result in Emphysema, which is

- (1) Damage to any Lung tissue causing increase in elasticity of the air sacs
- (2) Chronic damage to air sacs or alveoli leading to abnormal reduction in respiratory surface area

- (3) Persistent inflammation and damage to the cells lining the bronchi and bronchioles
- (4) An allergic reaction causing muscle spasms in the bronchial walls

Answer (2)

117. An example of flagellate protozoan is:

- (1) *Plasmodium*
- (2) *Paramecium*
- (3) *Trypanosoma*
- (4) *Entamoeba*

Answer (3)

118. In a hypothetical population of 100 individual having 'r'=0.5/female/year, what will be the population size in 6 years (with e = 2.72) showing exponential rate of growth?

- (1) 448
- (2) 1218
- (3) 739
- (4) 2012

Answer (4)

119. Which of the following statements is true for phloem in plants?

- (1) Phloem fibres are made up of collenchymatous cells
- (2) Sieve tube elements are multicellular with wide lumen and rich cytoplasm.
- (3) Companion cells help in maintaining the pressure gradient in sieve tubes.
- (4) Phloem parenchyma is abundantly present in monocots

Answer (3)

120. Which of the following ossicles is adhered to tympanic membrane of middle ear?

- (1) Malleus
- (2) Incus
- (3) Stapes
- (4) Utricle

Answer (1)

121. Growth hormone Auxin was isolated by F.W. Went from tips of seedling coleoptile of

- (1) Rice
- (2) Maize
- (3) Wheat
- (4) Oat

Answer (4)

122. Special feature about *Strobilanthus kunthiana* (neelakuranji) is its flowering once in :

- (1) 25 years (2) 12 years
 (3) 50 - 100 years (4) 6 years

Answer (2)

123. Which of the following pairs is **not** correctly matched?

Vegetative Propagules	Example
(1) Stolons	- Agave
(2) Offset	- Water hyacinth
(3) Eyes	- Potato
(4) Rhizome	- Ginger

Answer (1)

124. Which of the following is **not** true for callus culture?

- (1) It can be used for micropropagation
 (2) Somaclonal variation is generated
 (3) Parenchyma tissue increases by continuous mitotic divisions
 (4) Meiotic divisions are frequent

Answer (4)

125. Which of the following symmetry is exhibited by Echinoderm Larvae ?

- (1) Bilateral (2) Radial
 (3) Asymmetrical (4) Biradial

Answer (1)

126. A large amount of about 180 L of fluid is filtered by the human kidneys per day. Which one of the following renal corpuscle features does **not** justify this?

- (1) The efferent arteriole is wider than the afferent arteriole causing easier outflow of blood from the glomerulus.
 (2) The glomerular capillaries have a large surface area
 (3) The glomerular capillaries are fenestrated and hence leakier than other capillaries
 (4) The glomerular capillaries have a higher blood pressure than the other capillaries of the body

Answer (1)

127. Which of the following is **not** true of organisms in the Kingdom Monera ?

- (1) They reproduce by mitosis
 (2) They originated at least 3.5 billion years ago
 (3) They have prokaryotic cellular organization
 (4) They may be autotrophic or heterotrophic in nature

Answer (1)

128. Flippers of Penguins and Dolphins are the example of

- (1) Radiation (2) Homologous structure
 (3) Analogous structure (4) Divergent evolution

Answer (3)

129. A genetically engineered bacterium first used for cleaning the oil spills, was a species of :

- (1) *Rhizobium* (2) *Escherichia*
 (3) *Pseudomonas* (4) *Bacillus*

Answer (3)

130. What is **not** true for an angiospermic embryo sac ?

- (1) One male gamete is discharged into it during fertilization
 (2) It is present within an ovule
 (3) It represents female gametophyte
 (4) Its formation is preceded by meiosis

Answer (1)

131. In gene therapy to treat adenosine deaminase deficiency disorder, which of the patients blood cells are used ?

- (1) Thrombocytes
 (2) Erythrocytes
 (3) Lymphocytes
 (4) Both Erythrocytes and Lymphocytes

Answer (3)

132. The sequential events from initial stage till climax stage in a succession are called :

- (1) Migration (2) Ecesis
 (3) Sere (4) Nudation

Answer (3)

133. Van Mahotsava is a festival of :

- (1) Conservation of sacred groves
- (2) Planting trees in open areas
- (3) Taking oath to protect trees
- (4) Worshipping trees

Answer (2)

134. Which of the following **cannot** be measured by spirometry ?

- (1) Vital capacity
- (2) Tidal volume
- (3) Inspiratory reserve volume
- (4) Residual volume

Answer (4)

135. Which of the following statements is **correct** ?

- (1) AIDS is caused by a group of viruses called rhinovirus.
- (2) Acquired immunity is pathogen specific.
- (3) The exaggerated response of the immune system to certain antigens present in the environment is called Auto-immunity.
- (4) Bone marrow acts as a filter of the blood by trapping blood borne micro-organisms.

Answer (2)

136 Select the sac fungus :

- | | |
|-----------------------|---------------------|
| (1) <i>Albugo</i> | (2) <i>Agaricus</i> |
| (3) <i>Neurospora</i> | (4) <i>Mucor</i> |

Answer (3)

137. The recessive genes located on X-chromosome in humans are always :

- (1) sub-lethal
- (2) expressed in females
- (3) expressed in males
- (4) lethal

Answer (3)

138. Choose the correct sequence representing the ploidy of Nucellus; Megaspore mother cell; Megaspore; Egg cell; Zygote; A polar nucleus of embryo sac; Secondary nucleus and Primary endosperm nucleus.

- (1) n ; $2n$; $2n$; n ; $2n$; n ; $2n$; and $2n$
- (2) $2n$; $2n$; n ; $2n$; n ; $2n$; $3n$; and $2n$
- (3) $2n$; $2n$; n ; n ; $2n$; n ; $2n$; and $3n$
- (4) $2n$; n ; n ; $2n$; $3n$; $2n$; n ; and $3n$

Answer (3)

139. Signals for the onset of parturition originate from :

- (1) Mother's hypothalamus
- (2) Foetus and placenta
- (3) Mother's uterus
- (4) Mother's pituitary

Answer (2)

140. Which of the following structures does **not** open into the genital chamber of female cockroaches ?

- (1) A pair of collateral glands
- (2) A single median oviduct
- (3) Spermatheca
- (4) A pair of anal cerci

Answer (4)

141. All the components of the conducting system can generate an action potential for the contraction of heart muscle, but the sino-atrial node acts as the pacemaker because :

- (1) The sino-atrial node has a lower inherent rate of depolarisation
- (2) All the other components in heart cannot conduct the action potential
- (3) Only the sino-atrial node is auto-excitable and auto-rhythmic
- (4) The sino-atrial node has a higher inherent rate of depolarisation

Answer (4)

142. The chief function of vessels in the plant body is to :

- (1) Eliminate excess of water
- (2) Transport food materials manufactured in the leaves to other parts of the plant
- (3) Store food material in the form of starch or fat
- (4) Conduct water and mineral salts

Answer (4)

143. Select the incorrect option with respect to features present in three animals.

	Characters	Cockroach	Earthworm	Frog
1)	Development	direct	indirect	indirect
2)	Blood vascular system	open	closed	closed
3)	Body surface	dry	moist	moist
4)	Eyes	compound	absent	simple

Answer (1)

Sol.

144. "MOET" technique is used for super-ovulation in :

- (1) Elephants (2) Fish
 (3) Cattles (4) Chickens

Answer (3)

145. Continued self-pollination results in:

- (1) Genetic drift (2) Heterosis
 (3) Inbreeding depression (4) Polyembryony

Answer (3)

146. If the ratio of (T+C)/(A+G) in one strand of DNA is 1.43, same ratio in the complementary strand is:

- (1) 2.10 (2) 0.35
 (3) 0.70 (4) 1.43

Answer (3)

147. A complex of ribosomes attached to a single strand of mRNA is known as:

- (1) Okazaki fragment (2) Polymer
 (3) Polyribosome (4) Polypeptide

Answer (3)

148. The protein coat around a virus is called:

- (1) Capsule (2) Core
 (3) Capsid (4) Trichome

Answer (3)

149. A couple claimed in court that a child belonged to them. Their claim can be true if the DNA fingerprint pattern of the child shows.

- (1) 50% bands similar to father and 50% similar to mother DNA fingerprint pattern
 (2) 100% similarity to both the parents DNA fingerprint as both contribute equally to zygote formation

(3) 100% similarity to mother's DNA print because of maternal inheritance.

(4) 100% similarity to father's DNA print due to large number of mitochondria in sperm

Answer (1)

150. Which of the following statements regarding enzyme inhibition is correct?

- (1) Non competitive inhibitors often bind to the enzyme irreversibly
 (2) Competitive inhibition is seen when substrate competes with an enzyme for binding to an inhibition protein.
 (3) Competitive inhibition is seen when the substrate and the inhibitor compete.
 (4) Non competitive inhibition of an enzyme can be overcome by adding large amount of substrate.

Answer (3)

151. Which of the following values will depict correct respiratory quotient when tripalmitin (a fatty acid) is used as a respiratory substrate?

- (1) 1.1 (2) 1
 (3) 0.7 (4) 0.9

Answer (3)

152. Cholecystokinin acts on:

- (1) Pancreas and gall bladder
 (2) Gastric glands and liver
 (3) Pancreas and duodenum
 (4) Pancreas and intestine

Answer (1)

153. An athlete while running fell on the track. She used her hands to sustain minimal injury. In the process, her hands received the maximum blow on the joints. Which combination of joints would be badly affected in this accident ?

- (1) Cartilaginous and synaptic joints
 (2) Fibrous and cartilaginous joints
 (3) Fibrous and synovial joints
 (4) Cartilaginous and synovial joints

Answer (3)

154. Which of the following pathways is involved for packaging of secretory proteins ?

- (1) RER → Transface Golgi body → Cis face of Golgi body → Secretory vesicles
- (2) Transface of Golgi body → Cis face of Golgi body → RER → SER → Secretory vesicles
- (3) RER → Cis face of Golgi body → Transface of Golgi body → Secretory vesicles
- (4) Cis face of Golgi body → Transface of Golgi body → RER → Secretory vesicles

Answer (3)

155. Which of the following statements is not true ?

- (1) Loop of Henle is largely responsible for concentrated urine
- (2) Descending limb of loop of Henle is impermeable to solutes
- (3) Distal convoluted tubule functions in K^+ , Na^+ homeostasis
- (4) Descending limb of loop of Henle is impermeable to water

Answer (4)

156. Which one of the following is not true for the experiments of Mendel on pea ?

- (1) His experiments had large sampling size
- (2) He chose characters of two contrasting states
- (3) He used true-breeding lines
- (4) His observations were based on natural, open pollination

Answer (4)

157. The technique of DNA fingerprinting, is superior to conventional fingerprinting because it can:

- (1) Be generated more rapidly, and is inexpensive
- (2) Generate unique fingerprints for each finger
- (3) Compare the whole DNA sequence of two individuals
- (4) Differentiate between polymorphic DNA sequences among individuals

Answer (4)

158. An inflorescence with younger flowers at the base and the older ones at its apex is known as :

- (1) Hypanthodium (2) Head
- (3) Recemose (4) Cymose

Answer (4)

159. Name the element which is the main constituent of the ring structure of chlorophyll and helps to maintain the ribosome structure

- (1) Phosphorus (2) Calcium
- (3) Magnesium (4) Nitrogen

Answer (3)

160. The type of ribosomes is same in:

- (1) Eukaryotic cytoplasm, mitochondria and endoplasmic reticulum
- (2) Cytoplasm of eukaryotic cells, their mitochondria and chloroplasts
- (3) Cytoplasm of eukaryotic cells, their chloroplasts and microbodies
- (4) Prokaryotes, mitochondria and chloroplasts

Answer (4)

161. Which of the following ecologists has tried to put price-tags on nature's life support services ?

- (1) Robert May (2) David Tilman
- (3) Robert Constanza (4) Paul Ehrlich

Answer (3)

162. Tetradyamous stamens are characteristic of:

- (1) Brassicaceae (2) Solanaceae
- (3) Fabaceae (4) Liliaceae

Answer (1)

163. Which scientist proposed 'Rivet popper hypothesis' related to biodiversity and Ecosystems ?

- (1) Tansley
- (2) Alexander von Humboldt
- (3) Paul Ehrlich
- (4) David Tilman

Answer (3)

164. Which of the following enzymes is not protein ?

- (1) Ribozyme (2) Polymerase
- (3) Ligase (4) Lysozyme

Answer (1)

165. Which of the following statements is not true ?

- (1) Energy pyramids of an ecosystem tend to diminish at higher trophic levels
- (2) A single organism can feed at several trophic levels
- (3) Detritivores feed at all trophic levels except the producer level
- (4) Primary consumers are herbivores

Answer (3)

166. The increase in concentration of the toxicant at successive trophic levels is referred to as:

- (1) Biomagnification
- (2) Eutrophication
- (3) Bioremediation
- (4) Biotransformation

Answer (1)

167. Select the **correct** option :

- (1) Klinefelter's syndrome is due to extra X chromosome and results in sterile male
- (2) Phenylketonuria is X linked disease and results in accumulation of phenylpyruvic acid
- (3) Down's syndrome is due to triploidy and results in mental retardation
- (4) Turner's syndrome is due to trisomy and results in sterile female

Answer (1)

168. Pollen grains can be stored for years in liquid nitrogen, maintained at temperature :

- (1) -120°C
- (2) -20°C
- (3) -70°C
- (4) -196°C

Answer (4)

169. Which of the following is a proteinaceous and water soluble photosynthetic pigment ?

- (1) Chlorophyll
- (2) Xanthophyll
- (3) Phycocyanin
- (4) Anthocyanin

Answer (3)

170. Given below are defined the various taxonomic aids used in taxonomy which facilitate identification and classification of organisms. Which one of the following is wrong ?

- (1) Key, floras, manuals, monographs and catalogues are useful aids for identification of plants and animals.

- (2) Herbarium is created to house live specimens of plant material.
- (3) Museums are established to keep preserved specimens of animals and plants.
- (4) Botanical garden and zoological parks are established to conserve and preserve live plants and animals respectively

Answer (2)

171. Which of the following plants has association with *Frankia* ?

- (1) Lentils
- (2) Alfalfa
- (3) Alnus
- (4) Sweet pea

Answer (3)

172. Match Column - I with Column - II and select the correct option.

Column - I	Column - II
(a) <i>Plasmodium</i>	(i) Ringworm
(b) <i>Wuchereria</i>	(ii) Amoebiasis
(c) <i>Entamoeba</i>	(iii) Elephantiasis
(d) <i>Microsporium</i>	(iv) Malaria

Option :

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

Answer (1)

173. What is the meaning of Bt in Bt cotton ?

- (1) Cotton seeds carrying and endotoxin gene from *Bacillus thuringiensis* against pink boll-worm
- (2) Baculovirus treated cotton seeds against pink boll-worm
- (3) Bigger thread of disease resistant cotton with better tensile strength.
- (4) Cotton produced by Biotechnology using restriction Enzyme and Ligases to resist microbial infection

Answer (1)

174. The difference between Marasmus and Kwashiorkor is that :

- (1) Marasmus is a deficiency of just proteins while Kwashiorkor is due to a deficiency of both proteins and calories.
- (2) Marasmus is caused by deficiency of Vitamin B while Kwashiorkor is caused by the deficiency of Vitamin D.
- (3) Marasmus is caused by a calorie deficiency while Kwashiorkor is caused by protein deficiency.
- (4) Marasmus is a simultaneous deficiency of proteins and calories while Kwashiorkor is due to just protein deficiency unaccompanied by calorie deficiency

Answer (4)

175. In the heart, as the action potential reaches the AV node from the SA node, there is a delay of the action potential. This delay is important because :

- (1) It allows right atria to receive the blood from vena cava
- (2) It allows atria to rest
- (3) It allows a stronger right atrial contraction
- (4) It allows ventricles to receive all the blood from the atria

Answer (4)

176. At what phase of meiosis homologous chromosomes are separated ?

- (1) Anaphase II (2) Prophase I
- (3) Prophase II (4) Anaphase I

Answer (4)

177. Trace the correct path of sperm from seminiferous tubules :

- (1) Rete testis → vasa efferentia → epididymis → vas deferens

(2) Rete testis → epididymis → vasa efferentia → vas deferens

(3) Vasa efferentia → rete testis → vas deferens → epididymis

(4) Epididymis → vasa efferentia → rete testis → vas deferens

Answer (1)

178. Consider the following statements and choose the correct option :

- (a) Six codons do not code for any amino acid
- (b) Codon is read in m-RNA in a contiguous fashion
- (c) Three codons function as stop codons
- (d) The initiator codon AUG codes for methionine

Option :

- (1) (a) is wrong
- (2) (a), (b) and (d) are wrong
- (3) (a), (b) and (c) are wrong
- (4) (b), (c) and (d) are wrong

Answer (1)

179. In roots absorption of water and minerals mostly occurs in the :

- (1) Root cap
- (2) Region of elongation
- (3) Region of maturation
- (4) Meristematic region

Answer (3)

180. Reserved material in prokaryotic cells is stored as :

- (A) Basal body (B) Inclusion Bodies
- (C) Mesosome (D) Polysome

Answer (2)

