# MHT CET 2026 PCB Apr 24 Shift 1 Question Paper

Conducted by the State Common Entrance Test Cell, Maharashtra

**Time Allowed: 180 Minutes** **Total Questions: 200** **Maximum Marks: 200**

## General Instructions

(i) This **PCB** paper is from **MHT CET 2026**, conducted by the **State Common Entrance Test Cell, Maharashtra**.

(ii) Answer all **200 multiple choice questions**: **50 Physics**, **50 Chemistry** and **100 Biology**.

(iii) Each question offers **four choices**, with **one correct answer**.

(iv) Allow **90 minutes for Physics and Chemistry together**, followed by **90 minutes for Biology**. The first group closes before the second opens.

(v) Every correct answer earns **1 mark**.

(vi) There is **no negative marking**. Unanswered questions score zero.

**1.** $\vec{A}$ and $\vec{B}$ are expressed as $\vec{A} = 2\hat{i} + \hat{j}$ and $\vec{B} = \hat{i} - \hat{j}$. Unit vector perpendicular to $\vec{A}$ and $\vec{B}$ is

(A) $\frac{\hat{i}-\hat{j}+\hat{k}}{\sqrt{3}}$ (B) $\frac{\hat{i}+\hat{j}-\hat{k}}{\sqrt{3}}$

(C) $\frac{\hat{i}+\hat{k}}{\sqrt{3}}$ (D) $-\hat{k}$

**2.** The physical quantity $P = \frac{a^3b^2}{c^{1/3}d^{1/4}}$, where the percentage error in a, b, c, and d are 1%, $\frac{3}{2}$%, 3%, and 2% respectively. Then the percentage error in P is

(A) 14 % (B) 14.5 %

(C) 7 % (D) 7.5 %

**3.** For uniform acceleration in linear motion which of the following is **NOT CORRECT**?

(A) The area under the velocity-time graph equals the displacement. (B) Velocity-time graph is non-linear.

(C) Acceleration is the slope of velocity-time graph. (D) Velocity-time graph is linear.

**4.** Consider the following forces-(a) Force of friction, (b) Collision forces, (c) Normal reaction generated by the surface and (d) Tension in strings.
Which of these are electromagnetic forces?

(A) Only (a), (c) and (d) (B) Only (b)

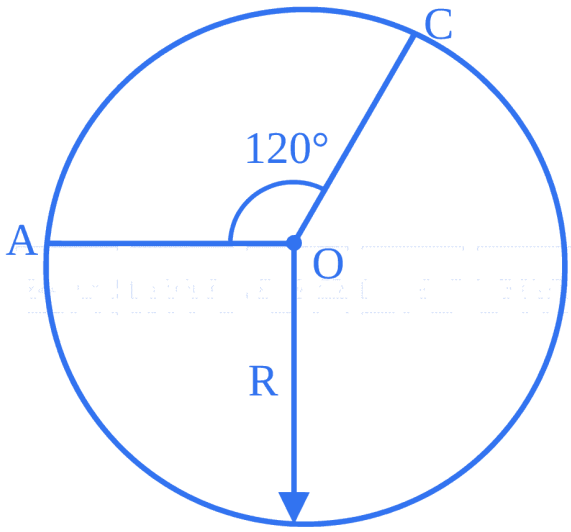
(C) All (a), (b), (c) and (d) (D) Only (c) and (d)

**5.** A flywheel used to prepare earthenware pots is set into rotation at 50 rpm. It is in the form of a disc of mass 5 kg and radius 0.2 m. A lump of clay (to be taken equivalent to a particle) of mass 0.8 kg falls on it and adheres to it at a certain distance 'x' from the centre. The value of 'x' if the wheel now rotates at 40 rpm, is

(A) 1 m (B) $\frac{1}{4}$ m

(C) $\frac{1}{\sqrt{32}}$ m (D) $\frac{1}{\sqrt{8}}$ m

**6.** From a uniform circular disc of mass M and radius R, part AOC is removed as shown in the figure. The M.I. of the remaining portion of the disc about an axis passing through the centre and perpendicular to the plane of the disc is




(A) $\frac{MR^2}{3}$ (B) $\frac{MR^2}{9}$

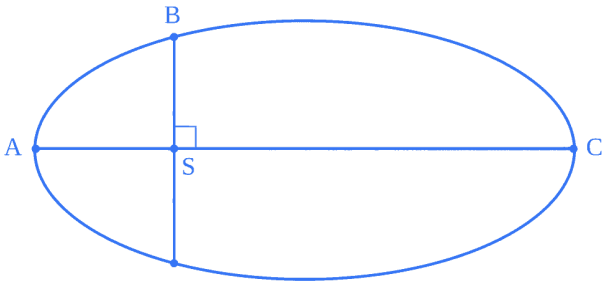
(C) $\frac{MR^2}{6}$ (D) $\frac{MR^2}{12}$

**7.** A thin circular ring of mass M and radius r is rotating about its axis with a constant angular velocity $\omega$. Six objects, each of mass m, are kept gently to the opposite ends of three diameters of the ring. The angular velocity of the ring will be

(A) $\frac{(M+6m)\omega}{M}$ (B) $\frac{M\omega}{6m}$

(C) $\frac{M\omega}{M+6m}$ (D) $\frac{(M-6m)\omega}{M+6m}$

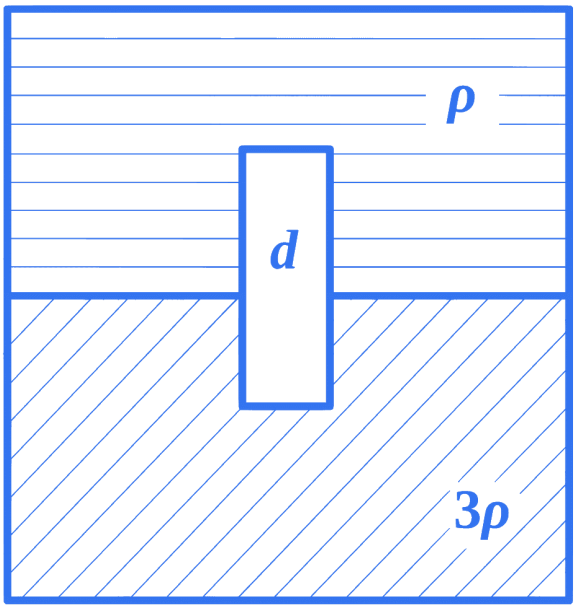
**8.** The kinetic energies of planets in an elliptical orbit about the Sun, at positions A, B and C are $K_A$, $K_B$ and $K_C$, respectively. AC is the major axis and SB is perpendicular to AC at the position of the Sun as shown in figure. Then




(A) $K_B < K_A < K_C$ (B) $K_A > K_B > K_C$

(C) $K_A < K_B < K_C$ (D) $K_B > K_A < K_C$

**9.** A solid cylinder of length $l$ and cross-sectional area A is immersed such that it floats with its axis vertical at the liquid-liquid interface with length $\frac{l}{3}$ in the denser liquid as shown in the figure. The lower density liquid is open to the atmosphere, having pressure $P_0$. The density of a solid cylinder is




(A) $\frac{3\rho}{2}$ (B) $\frac{2\rho}{3}$

(C) $\frac{5\rho}{3}$ (D) $\frac{3\rho}{5}$

**10.** An ice cube floats in water. The percentage of volume of ice cube outside the water is [density of water = 1 g/cc, density of ice = 0.9 g/cc]

(A) 40 % (B) 30 %

(C) 10 % (D) 5 %

**11.** A certain number of spherical drops of a liquid of radius 'r' coalesce to form a single drop of the radius 'R' and volume V. If T is the surface tension of the liquid, then the energy released in this process is

(A) $VT\left(\frac{1}{r}-\frac{1}{R}\right)$ (B) $3VT\left(\frac{1}{r}-\frac{1}{R}\right)$

(C) $2VT\left(\frac{1}{r}-\frac{1}{R}\right)$ (D) $4VT\left(\frac{1}{r}-\frac{1}{R}\right)$

**12.** Three spheres P, Q and R, having radii of 2 m, 3 m and 4 m respectively, are coated with lamp-black on their outer surfaces. The wavelengths corresponding to maximum intensity are 200 nm, 300 nm and 400 nm respectively. If the powers radiated by them are $P_P$, $P_Q$ and $P_R$ respectively, then

(A) $P_P$ is maximum (B) $P_Q$ is maximum

(C) $P_R$ is maximum (D) $P_P = P_Q = P_R$

**13.** A metal sphere cools from 80°C to 60°C in 10 minute. The time taken (in minute) by it to cool from 60°C to 40°C if the room temperature is 30°C, is

(A) 10 (B) 20

(C) 30 (D) 40

**14.** The rectangular surface area (12 cm × 6 cm) of the black body, at a temperature 127°C, emits heat energy at the rate of Q units per second. If the length and breadth of the surface area are each reduced to half of its initial value and the temperature is increased to 327°C, then the emission of heat energy will be

(A) $\frac{9Q}{4}$ (B) $\frac{81Q}{16}$

(C) $\frac{81Q}{32}$ (D) $\frac{81Q}{64}$

**15.** A gas for which $\gamma$ is 3/2 is heated at constant pressure. The percentage of heat supplied for external work is nearly

(A) 11 % (B) 22 %

(C) 33 % (D) 44 %

**16.** A mono-atomic ideal gas, initially at temperature $T_1$ is enclosed in a cylinder fitted with a frictionless piston. The gas is allowed to expand adiabatically to a temperature $T_2$ by releasing the piston suddenly. $L_1$ and $L_2$ are the lengths of gas columns before and after the expansion, respectively. The value of $\frac{T_1}{T_2}$ is $\left[\gamma = \frac{5}{3}\right]$

(A) $\left(\frac{L_1}{L_2}\right)^{\frac{2}{3}}$ (B) $\left(\frac{L_2}{L_1}\right)^{\frac{2}{3}}$

(C) $\left(\frac{L_1}{L_2}\right)^{\frac{5}{3}}$ (D) $\left(\frac{L_2}{L_1}\right)^{\frac{5}{3}}$

**17.** There are two vessels A and B with rigid walls containing ideal gases. The pressure, temperature and volume are $P_A$, $T_A$ and V in the vessel A and $P_B$, $T_B$ and V in vessel B. The vessels are now connected through a small tube. In equilibrium, pressure is P and temperature is T, then $\frac{P}{T}$ is {number of moles of gas in vessel A = number of moles of gas in vessel B}

(A) $\frac{1}{2}\left(\frac{P_A}{T_A} + \frac{P_B}{T_B}\right)$ (B) $\frac{3}{2}\left(\frac{P_A}{T_A} + \frac{P_B}{T_B}\right)$

(C) $\frac{3}{4}\left(\frac{P_A}{T_A} + \frac{P_B}{T_B}\right)$ (D) $\frac{5}{4}\left(\frac{P_A}{T_A} + \frac{P_B}{T_B}\right)$

**18.** Two particles A and B execute S.H.M.s of periods T and $\frac{5T}{2}$. If they start from the mean position, then the phase difference between them when the particle A completes two oscillations will be (in radian)

(A) $\frac{\pi}{5}$ (B) $\frac{3\pi}{5}$

(C) $\frac{6\pi}{5}$ (D) $\frac{12\pi}{5}$

**19.** A body is suspended from the two light springs separately. The periods of vertical oscillations are T and 3T respectively. The same body is suspended from two springs connected first in parallel and then in series. The periods of oscillation in both cases, respectively, are

(A) $\frac{2T}{\sqrt{5}}$, $\sqrt{5}T$ (B) $\frac{3T}{\sqrt{10}}$, $\sqrt{10}T$

(C) $\frac{4T}{\sqrt{15}}$, $\sqrt{15}T$ (D) $\sqrt{5}T$, $\frac{2T}{\sqrt{5}}$

**20.** If the length of seconds pendulum on the surface of the earth is 1 m. The length of the seconds pendulum on the surface of the planet is $\left\{g_{planet} = \frac{7}{2}g_{earth}\right\}$ {periodic time of the seconds pendulum is same on both planets}

(A) $\frac{1}{7}\ m$ (B) $\frac{2}{7}\ m$

(C) $\frac{7}{2}\ m$ (D) $7\ m$

**21.** A wave is represented by the equation $y = 0.2\ \sin 4\pi\left[\frac{t}{0.08} + \frac{x}{0.8} + \frac{1}{12}\right]$ in SI units. The expression represents a wave traveling in the

(A) positive x-direction with velocity 10 m/s and with wavelength 0.4 m.

(B) negative x-direction with velocity 10 m/s and with wavelength 0.4 m.

(C) positive x-direction with velocity 20 m/s and with wavelength 0.6 m.

(D) negative x-direction with velocity 20 m/s and with wavelength 0.6 m.

**22.** The length of a sonometer wire AB is 176 cm. Where should the two bridges be placed from end A to divide the wire into three segments whose fundamental frequencies are in the ratio 1 : 2 : 3?

(A) 90 cm and 140 cm (B) 96 cm and 144 cm

(C) 92 cm and 142 cm (D) 94 cm and 48 cm

**23.** Two identical straight wires are stretched so as to produce 8 beats per second when vibrating simultaneously with tensions $T_1$ and $T_2$ respectively. On changing the tensions, the beat frequency remains unchanged. This will happen when $(T_1 > T_2)$

(A) both $T_1$ and $T_2$ is decreased by value 256 N

(B) both $T_1$ and $T_2$ is increased by value 256 N

(C) $T_1$ is decreased or $T_2$ is increased

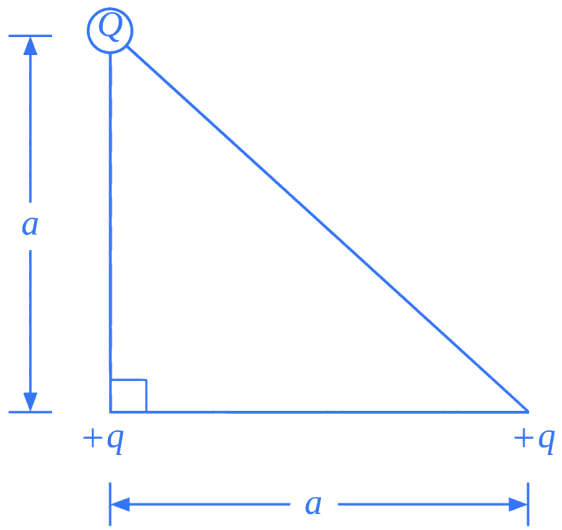
(D) $T_1$ is increased or $T_2$ is decreased

**24.** The density of oxygen is 16 times that of hydrogen. The ratio of the velocity of sound in oxygen to that in hydrogen is

(A) 1 : 4 (B) 4 : 1

(C) 1 : 2 (D) 2 : 1

**25.** Three charges Q, $+q$ and $+q$ are placed at the vertices of the right angle triangle (isosceles triangle) as shown. The net electrostatic energy of the configuration is zero, if Q is equal to [a = length of two equal sides of a triangle]




(A) $\frac{-q}{1+\sqrt{2}}$ (B) $\frac{-\sqrt{2}q}{1+\sqrt{2}}$

(C) $\frac{-q}{1+\sqrt{3}}$ (D) $-q$

**26.** Three metallic spherical shells (not concentric) of radii R, 2R and 4R are given charges $Q_1$, $Q_2$ and $Q_3$ respectively. It is found that the surface charge densities on the outer surfaces of the shells are equal. Then, the ratio of the charges $Q_1 : Q_2 : Q_3$, is

(A) 1 : 2 : 4 (B) 1 : 3 : 9

(C) 1 : 4 : 16 (D) 1 : 6 : 12

**27.** The amount of work done in increasing voltage across the plates of capacitor from 5 V to 10 V is W. The work done in increasing it from 10 V to 20 V is

(A) $W$ (B) $2W$

(C) $3W$ (D) $4W$

**28.** Three identical parallel plate air capacitors are connected in series to a battery of e.m.f. V. If two capacitors are completely filled with dielectric material of constant k, then potential difference across the third capacitor will become

(A) $\frac{k}{V(k+2)}$ (B) $\frac{kV}{(k+2)}$

(C) $\frac{k-2}{kV}$ (D) $\frac{V}{k(k+2)}$

**29.** A potentiometer wire has length 4 m and resistance 8 Ω. The resistance that must be connected in series with the wire and the driving battery of e.m.f. 2 V, so as to get a potential gradient of 1 mV per cm on the wire is

(A) 50 Ω (B) 42 Ω

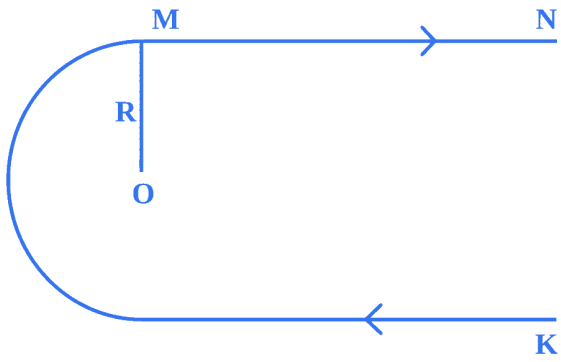
(C) 40 Ω (D) 32 Ω

**30.** A resistance is to be measured using a meter bridge; the student chooses the standard resistance R to be 100 Ω. The student finds the null point at $l_1 = 16$ cm. To get the null point near the middle of the wire, the value of R will be

(A) 49 Ω (B) 39 Ω

(C) 19 Ω (D) 29 Ω

**31.** If the current 'i' is passing through the wire, it has a shape as shown in the figure. The radius of the curved part is R and the linear part is assumed to be very long. The magnetic induction of the field at the point O, is
($\mu_0$ =permeability of free space)




(A) $\frac{\mu_0 i}{2\pi R}\left(2+\frac{\pi}{2}\right)$ (B) $\frac{\mu_0 i}{4\pi R}(2+\pi)$

(C) $\frac{\mu_0 i}{2\pi R}\left(1+\frac{3\pi}{2}\right)$ (D) $\frac{\mu_0 i}{\pi R}\left(1+\frac{\pi}{2}\right)$

**32.** In a cyclotron, for the same values of B and R, what is the ratio of the maximum kinetic energies of $\alpha$ particles and deuteron? {Mass of deuteron $= 2m_p$, charge on deuteron $= +e$}

(A) 1 (B) 2

(C) 3 (D) 4

**33.** There are four lightweight rod samples P, Q, R and S separately suspended by thread. A bar magnet is slowly brought near to each sample and the following observations are noted
(a) P is weakly repelled
(b) R is strongly attracted
(c) S remains unaffected
(d) Q is weakly attracted
Which of the following is true?

(A) R is of a diamagnetic material
(B) P is of a non-magnetic material
(C) S is of a ferromagnetic material
(D) Q is of a paramagnetic material

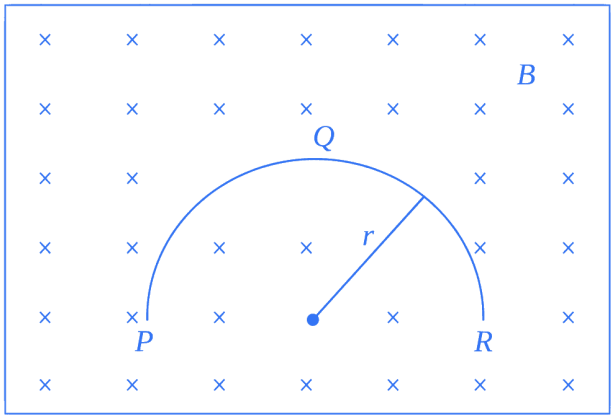
**34.** A wire of length $l$ in the form of a square loop is in a plane normal to magnetic field B. If the length of the wire is decreasing at the rate $\frac{dl}{dt}$, the e.m.f. induced is $e_1$. If this wire is converted into a circular loop, the e.m.f. induced in a circular loop is $e_2$. Then $\frac{e_1}{e_2}$ is

(A) $\frac{\pi}{2}$
(B) $\frac{\pi}{4}$
(C) $\frac{3\pi}{4}$
(D) $\pi$

**35.** Semicircular wire of radius R is rotated in a uniform magnetic field about an axis passing through its ends. If the frequency of rotation is f, the amplitude of induced e.m.f. in the wire is [B= magnetic field induction]

(A) $\pi^2 Rf B$
(B) $\pi^2 R^2 f B$
(C) $2\pi^2 Rf B$
(D) $2\pi^2 Rf^2 B$

**36.** A thin semicircular conducting ring (PQR) of radius r is falling with its plane vertical in a horizontal magnetic field B as shown in the figure. The potential difference developed across the ring when its speed is v, is
$\{\sin(90)^\circ = 1\}$




(A) $\pi r B v$ and terminal R is at higher potential
(B) $\frac{Bv\pi r^2}{2}$ and terminal P is at higher potential
(C) $2rBv$ and terminal R is at higher potential
(D) zero

**37.** An alternating voltage is given as, $E = 100\sqrt{2}\sin 100t$
This voltage E is applied to a capacitor of 1 $\mu$F. The current reading in an a.c. ammeter in mA is

(A) 10
(B) 20
(C) 40
(D) 80

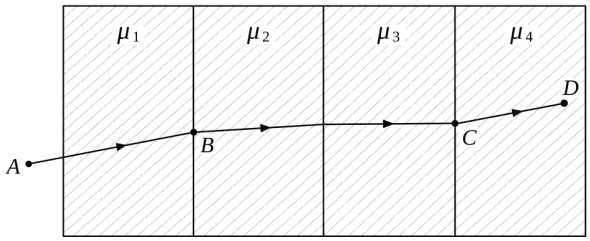
**38.** The alternating voltage is given by $V = V_0 \sin\left(\omega t + \frac{\pi}{6}\right)$. When will the voltage be maximum for the first time?
$\{\sin(90)^\circ = 1\}$

(A) $\frac{T}{12}$
(B) $\frac{T}{6}$
(C) $\frac{T}{3}$
(D) $\frac{T}{2}$

**39.** A series LCR circuit is connected across a source E of e.m.f. $E = 15\sin\left(50\pi t - \frac{\pi}{3}\right)$. The current from the supply is $I = 5\sin\left(50\pi t + \frac{\pi}{6}\right)$. The impedance of the circuit and the phase difference between e.m.f. and current are, respectively, [all the quantities in the above two equations are in SI units.]

(A) 5 Ω, $\left(\frac{\pi}{6}\right)^c$
(B) 3 Ω, $\left(\frac{\pi}{2}\right)^c$
(C) 7 Ω, $\left(\frac{\pi}{12}\right)^c$
(D) 9 Ω, $\left(\frac{\pi}{4}\right)^c$

**40.** A ray of light passes through four transparent media with refractive indices $\mu_1$, $\mu_2$, $\mu_3$ and $\mu_4$ as shown in the figure. The surfaces of all media are parallel. If the emergent ray CD is parallel to the incident ray AB, then




(A) $\mu_1 = \mu_2$ (B) $\mu_2 = \mu_3$

(C) $\mu_3 = \mu_4$ (D) $\mu_4 = \mu_1$

**41.** An object is placed 15 cm from a concave mirror of focal length 10 cm, then the nature of the image formed will be

(A) magnified and inverted (B) magnified and erect

(C) small in size and inverted (D) small in size and erect

**42.** In Young's double slit, 18 fringes are observed to be formed in a certain segment of the screen when light of wavelength 400 nm is used. If the wavelength is changed to 600 nm, the number of fringes observed in the same segment of the screen is

(A) 6 (B) 12

(C) 18 (D) 24

**43.** In Young's double slit experiment using a monochromatic light of wavelength $\lambda$. The path difference (in terms of an integer n) corresponding to any point having one fourth of its peak intensity is

$\{\cos(\pi/3) = 1/2,\ \cos(4\pi/3) = -1/2\}$

(A) $\left(n \pm \frac{1}{2}\right)\lambda,\ n = 0,1,2$

(B) $\left(n \pm \frac{1}{3}\right)\lambda,\ n = 0, 1, 2$

(C) $\left(n \pm \frac{1}{4}\right)\lambda,\ n = 0, 1, 2$

(D) $\left(n \pm \frac{1}{5}\right)\lambda,\ n = 0, 1, 2$

**44.** The additional energy that should be given to an electron to reduce its de-Broglie wavelength from 1 nm to 0.5 nm is $x$ times the initial kinetic energy. The value of $x$ is

(A) 0.5 (B) 2

(C) 3 (D) 4

**45.** In a photoelectric cell, for the incident radiation of wavelength $\lambda$, the fastest electron has speed 'v'. If the wavelength of incident radiation is changed to $\frac{\lambda}{3}$, the speed of the fastest emitted electron is

(A) $v\left(\frac{1}{\sqrt{3}}\right)$ (B) $v(\sqrt{3})$

(C) less than $v(\sqrt{3})$ (D) greater than $v(\sqrt{3})$

**46.** Two spherical nuclei have mass numbers 216 and 64 with their radii $R_1$ and $R_2$ respectively. The ratio $\frac{R_1}{R_2}$ is

(A) 1 : 2 (B) 1 : 3

(C) 2 : 3 (D) 3 : 2

**47.** A radioactive nucleus ${}_{92}X^{235}$ decays to ${}_{91}Y^{231}$. Which of the following particles are emitted?

(A) One alpha and one beta particle (B) Two deuterons and one positron

(C) One alpha and one proton (D) One proton and four neutrons

**48.** Which of the following statements is **NOT TRUE**?

(A) The majority carriers in n-type semiconductors are electrons. (B) The resistance of an intrinsic semiconductor decreases with increase in temperature.

(C) Doping pure silicon crystal with trivalent impurities gives p-type semiconductor. (D) The majority carriers in n-type semiconductors are holes.

**49.** For a common emitter amplifier, the audio signal voltage across the collector resistance of 2 k$\Omega$ is 4 V. If the current amplification factor of the transistor is 100 and the base resistance is 1 k$\Omega$, then the input voltage is

(A) 10 mV (B) 15 mV

(C) 20 mV (D) 25 mV

**50.** Below we give four entries for the truth table of two point input OR gate. Which two are wrong?

| | $A$ | $BY$ |
|---|---|---|
| i | 1 | 01 |
| ii | 1 | 10 |
| iii | 0 | 01 |
| iv | 0 | 11 |

(A) (i) and (ii) (B) (ii) and (iii)

(C) (iii) and (iv) (D) (iv) and (i)

**51.** What is the number of moles of Cl atoms present in n moles of tear gas and in n moles of mustard gas respectively?

(A) $2n$ and $3n$ (B) $3n$ and $2n$

(C) $n$ and $3n$ (D) $n$ and $2n$

**52.** Find the mass of lime obtained by heating 500 g of 90% pure lime stone. [Molar masses Ca = 40 g/mol, O = 16 g/mol & C = 12 g/mol]

(A) 252 g (B) 280 g

(C) 265 g (D) 230 g

**53.** Find the wave number of the $4^{th}$ line in the Lyman series of H spectrum. (R = Rydberg constant)

(A) $24/(25R)$ $cm^{-1}$ (B) $25/(25R)$ $cm^{-1}$

(C) $(25R)/24$ $cm^{-1}$ (D) $(24R)/25$ $cm^{-1}$

**54.** Which has the maximum electropositive character?

(A) Cu (B) Cs

(C) Ba (D) Cr

**55.** Identify the correct decreasing order of lattice enthalpy for metal fluorides from following.

(A) KF > NaF > LiF (B) NaF > KF > LiF

(C) LiF > KF > NaF (D) LiF > NaF > KF

**56.** Which of the following relations is correct regarding rate of diffusion of a gas?

(A) directly proportional to its density (B) directly proportional to its molecular mass

(C) directly proportional to the square of its molecular mass (D) inversely proportional to the square root of its molecular mass

**57.** What is the work done in the formation of 1 mole gaseous methane from solid carbon and gaseous hydrogen at 27°C? ( $R = 8.314$ J $k^{-1}$ $mol^{-1}$)

(A) −2.4942 kJ (B) +2.4942 kJ

(C) −24.942 kJ (D) +24.942 kJ

**58.** Which of the following is applicable for isothermal process?

(A) $W = -Q$

(B) $-\Delta U = -W$

(C) $\Delta U = Q_v$

(D) $Q_p = \Delta U + P_{ext}\Delta V$

**59.** The bond enthalpies of H-H, Cl-Cl, and H-Cl bonds are 437 kJ/mol, 239 kJ/mol, and 433 kJ/mol respectively. Calculate the enthalpy of formation of HCl.

(A) 249 kJ/mol (B) −248 kJ/mol

(C) −95 kJ/mol (D) 98 kJ/mol

**60.** Calculate the amount of NaOH in g/L in a one L solution of it with the pH of 12. (Molar mass of NaOH = 40 g/mol)

(A) 0.4 g/L (B) 2 g/L

(C) 4 g/L (D) 0.2 g/L

**61.** The solubility of AgBr at 298 K is $2 \times 10^{-7}$ kg/$dm^3$. Find the solubility product of AgBr at same temperature. [Molar mass of AgBr = 188 g/mol]

(A) $1.981 \times 10^{-12}$ (B) $1.632 \times 10^{-12}$

(C) $1.425 \times 10^{-12}$ (D) $1.124 \times 10^{-12}$

**62.** Which of the following aqueous solutions of salts is neutral?

(A) $NH_4NO_3$ (B) KCN

(C) $KNO_3$ (D) $CuCl_2$

**63.** Identify the gas that readily decolourises acidified $KMnO_4$ solution.

(A) $CO_2$ (B) $SO_2$

(C) $NO_2$ (D) $H_2S$

**64.** Which of the following statement is NOT correct about a racemic mixture?

(A) It is an equimolar mixture of enantiomers. (B) Enantiomers have identical refractive index.

(C) It is optically active. (D) It is optically inactive.

**65.** Which of the following exhibits $-I$ effect?

(A) $-C(CH_3)_3$ (B) $-NO_2$

(C) $-C_2H_5$ (D) $-CH_3$

**66.** Identify the product obtained when toluene reacts with chlorine in the presence of $FeCl_3$.

(A) benzyl chloride (B) m-Chloro toluene

(C) chlorobenzene (D) o-Chlorotoluene and p-Chlorotoluene

**67.** Chlorobenzene is formed by the reaction between benzene and chlorine in presence of $AlCl_3$. Which of the following species actually attacks the benzene ring in this reaction?

(A) $Cl^-$ (B) $Cl_2$

(C) $Cl^+$ (D) $AlCl_4^-$

**68.** What is the general molecular formula for alkenes?

(A) $C_nH_{2n+2}$ (B) $C_nH_{2n}$

(C) $C_nH_{2n-2}$ (D) $C_nH_n$

**69.** Which of the following crystals are the hardest and most incompressible of all materials.

(A) Magnesium oxide (B) Diamond

(C) Sugar (D) Copper

**70.** The volume of fcc unit cell is $5.6 \times 10^{-23}$ cm$^3$. Calculate the molar mass of metal if the density of metal is 20.4 g cm$^{-3}$. [$N_A = 6.022 \times 10^{23}$]

(A) 172 g mol$^{-1}$ (B) 192 g mol$^{-1}$

(C) 156 g mol$^{-1}$ (D) 180 g mol$^{-1}$

**71.** The silicon doped with gallium forms

(A) n-type semiconductor (B) both n and p-type semiconductor

(C) an intrinsic semiconductor (D) p-type semiconductor

**72.** Calculate relative lowering of vapor pressure of 1 molal glucose solution in water at room temperature. (molar mass of water = 18)

(A) $2.1 \times 10^{-3}$ (B) $1.5 \times 10^{-2}$

(C) $2.5 \times 10^{-3}$ (D) $1.8 \times 10^{-2}$

**73.** Which of the following solutions has maximum vapour pressure?

(A) 1 M copper sulphate solution (B) 0.01 M copper sulphate solution

(C) 0.5 M copper sulphate solution (D) 2 M copper sulphate solution

**74.** The molar conductivity of 0.02 M electrolytic solution is 220 $\Omega^{-1}$ cm$^2$ mol$^{-1}$ at 25 °C. Find its conductivity.

(A) 0.0044 $\Omega^{-1}$ cm$^{-1}$ (B) 0.0022 $\Omega^{-1}$ cm$^{-1}$

(C) 0.0011 $\Omega^{-1}$ cm$^{-1}$ (D) 0.0033 $\Omega^{-1}$ cm$^{-1}$

**75.** A 0.02 M KCl solution has conductivity $k = 2.76 \times 10^{-3}$ S cm$^{-1}$. Find molar conductivity.

(A) 130 S cm$^2$mol$^{-1}$ (B) 138 S cm$^2$mol$^{-1}$

(C) 148 S cm$^2$mol$^{-1}$ (D) 150 S cm$^2$mol$^{-1}$

**76.** The standard electrode potential of Zn, Ag and Cu are $-0.76$, 0.80 and 0.34 volt respectively, then identify the correct statement from following.

(A) Ag can oxidise Zn and Cu (B) Ag can reduce $Zn^{2+}$ and $Cu^{2+}$

(C) Zn can reduce $Ag^+$ and $Cu^{2+}$ (D) Cu can oxidise Zn and Ag

**77.** What is the value of standard electrode potential of the standard hydrogen gas electrode?

(A) +1.00 V (B) $-1.00$ V

(C) 0.00 V (D) +0.50 V

**78.** Integrated rate law for zero order reaction is

(A) $K = \frac{2.303}{t} \log_{10} \frac{[A]_0}{[A]_t}$ (B) $K = \frac{2.303}{t} \log_{10} \frac{a}{a-x}$

(C) $K = \frac{0.693}{t_{1/2}}$ (D) $K = \frac{[A]_0 - [A]_t}{t}$

**79.** The rate constant for the first order reaction is given by $\ln k = 15 - (1.5 \times 10^4)/T$. Calculate the activation energy.

(A) 125 kJ mol$^{-1}$ (B) 120 kJ mol$^{-1}$

(C) 130 kJ mol$^{-1}$ (D) 140 kJ mol$^{-1}$

**80.** For the reaction, $NO_{2(g)} + CO_{(g)} \rightarrow NO_{(g)} + CO_{2(g)}$ the rate expression is found to be: rate $= k[NO_2]^2$. What is the order of reaction with respect to CO?

(A) 2 (B) 0

(C) 1 (D) 1/2

**81.** Find the color of the gold nanoparticles in solution.

(A) Yellow (B) Pink

(C) Black (D) Red

**82.** What type of solutions is starch in water?

(A) true solution (B) suspension

(C) lyophilic sol (D) lyophobic sol

**83.** Find the number of total atoms of all halogens present in 1 mole molecule of inter halogen compounds having $+7$ oxidation state of central halogen.

(A) $4.82 \times 10^{24}$ (B) $4.21 \times 10^{24}$

(C) $3.61 \times 10^{23}$ (D) $3.01 \times 10^{23}$

**84.** Which of the following is the correct order of basicity of lanthoids in their common oxidation state?

(A) $La^{3+} > Lu^{3+} > Ce^{3+} > Eu^{3+}$

(B) $Ce^{3+} > Lu^{3+} > La^{3+} > Eu^{3+}$

(C) $Lu^{3+} > Ce^{3+} > Eu^{3+} > La^{3+}$

(D) $La^{3+} > Ce^{3+} > Eu^{3+} > Lu^{3+}$

**85.** Identify the geometry and magnetic behavior of the complex $[Ni(CO)_4]$.

(A) square planar geometry and diamagnetic

(B) tetrahedral geometry and diamagnetic

(C) square planar geometry and paramagnetic

(D) tetrahedral geometry and paramagnetic.

**86.** Identify homoleptic complex from following.

(A) Bis(ethylenediamine)dithiocyanatoplatinum(IV)

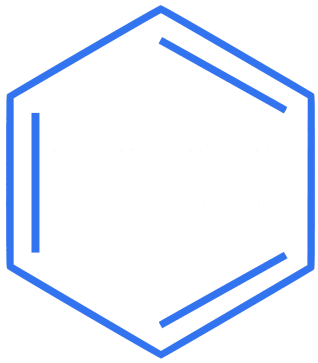
(B) Tetraamminecopper(II) ion

(C) Triamminetrinitrocobalt(III)

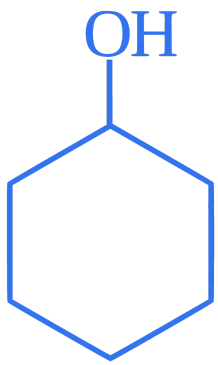
(D) Triamminetrithiocyanatorhodium(III)

**87.** Identify the product formed when the mixture of Phenol and Hydrogen is passed over nickel catalyst at 433 K.

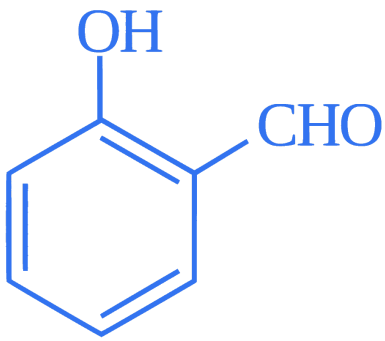
(A)



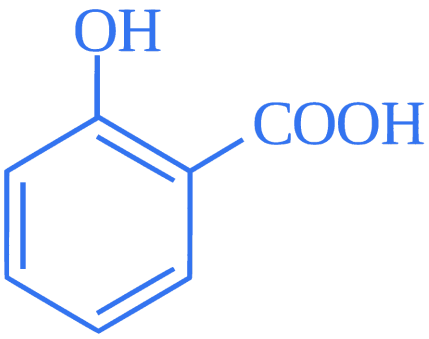
(B)




(C)




(D)



**88.** Phenols react with neutral ferric chloride, then which coloration is NOT produced?

(A) Purple (B) violet

(C) green (D) Black

**89.** Identify a final product obtained when Pent-3-enenitrile is treated with $AlH(i\text{-}Bu)_2$ followed by acid hydrolysis.

(A) Pent-3-enol (B) Pentanoic acid

(C) But-3-enol (D) Pent-3-enal

**90.** Which of the following undergoes Haloform reaction?

(A) HCHO (B) $C_2H_5Cl$

(C) $(CH_3)_2CO$ (D) $CH_3$-O-$CH_3$

**91.** Identify the product of acid hydrolysis of propane nitrile.

(A) Propanal (B) Acetic acid

(C) Propionamide (D) Propanoic acid

**92.** Which of the following amines has imino functional group?

(A) Ethyl amine (B) Trimethyl amine

(C) Dimethyl amine (D) Aniline

**93.** The chemical formula of Hinsberg reagent is:

(A) $C_6H_5SO_3Cl$ (B) $C_6H_5SO_2Cl$

(C) $C_2H_5SO_2Cl$ (D) $C_6H_5N_2Cl$

**94.** Identify product 'B' in the following sequence of reactions.

Aniline $\xrightarrow{NaNO_2+HCl,\ 273\ K} A \xrightarrow{H_2O,\ \Delta} B + N_2 \uparrow$

(A) Sodium phenoxide (B) Phenol

(C) Benzenediazonium chloride (D) Nitrobenzene

**95.** Which of the following reagents is used to identify one primary alcoholic group of glucose?

(A) $Br_2$ water (B) dilute $HNO_3$

(C) Acetic anhydride (D) $NH_2OH$

**96.** Match List I with List II

| List I (CARBOHYDRATE) | List II (TYPE) |
|---|---|
| (A). Glycogen | (I). Oligosaccharide |
| (B). Stachyose | (II). Monosaccharide |
| (C). Ribose | (III). Polysaccharide |

Choose the **correct** answer from the options given below:

(A) (A) - (I), (B) - (III), (C) - (II) (B) (A) - (III), (B) - (I), (C) - (II)

(C) (A) - (I), (B) - (II), (C) - (III) (D) (A) - (III), (B) - (II), (C) - (I)

**97.** $O_2$ gas has very low solubility in water. However, its solubility in blood is excessively high. This is because of

(A) water is less viscous than blood (B) blood is colloidal mixture

(C) binding of $O_2$ molecule to hemoglobin in blood. (D) blood has low pressure

**98.** Which one of the following polymers is NOT obtained by condensation polymerisation?

(A) Nylon 6,6 (B) Buna-N

(C) Bakelite (D) Terylene

**99.** Identify the monomer of natural rubber.

(A) Acrylonitrile (B) Isoprene

(C) Epsilon-caprolactam (D) Tetrafluoroethylene

**100.** Which of the following are not used for the treatment of humans?

(A) Antiseptics (B) Disinfectants

(C) Antimalarials (D) Antibiotics

**101.** In the Tobacco Mosaic Virus (TMV), hereditary material is _____ .

(A) single stranded DNA
(B) single stranded RNA
(C) double stranded DNA
(D) double stranded RNA

**102.** Glycogen stored in animal body is converted into glucose through _____ .

(A) glycolysis
(B) hydrolysis
(C) reduction
(D) oxidation

**103.** Glucosinolates protect _____ plant from pest attack.

(A) tomato
(B) soyabean
(C) cabbage
(D) cotton

**104.** Which one of the following is the activator for enzyme Pyruvate Kinase?

(A) $Zn^{++}$
(B) $Mg^{++}$
(C) $Ca^{++}$
(D) $Mn^{++}$

**105.** Which one of the following is NOT an objection against capillarity theory of ascent of sap in plants?

(A) Xylem tracheids compared to capillary tube show closed end walls.
(B) The xylem is not in direct contact with soil water.
(C) Because of capillarity, water can be raised to tall trees.
(D) Tall trees have wider xylem vessels which do not support capillarity.

**106.** When a few plasmolysed cells are kept in _____ solution, the cells become turgid.

(A) hypertonic
(B) hypotonic
(C) isotonic
(D) 20% sugar

**107.** Which one of the following is NOT needed for the facilitated diffusion in plants?

(A) Concentration gradient
(B) Aquaporins
(C) Ion channel
(D) Expenditure of energy

**108.** The term water potential is also used for _____ pressure.

(A) suction
(B) osmotic
(C) wall
(D) turgor

**109.** Stomatal transpiration takes place during day time in the following plants EXCEPT_____.

(A) Lotus
(B) Mango
(C) Grass
(D) Cactus

**110.** Identify the INCORRECT match regarding the mineral element and its occurrence in living cell.
Mineral element — constituent of

(A) Nitrogen — protein
(B) Phosphorus — cell wall
(C) Magnesium — chlorophyll
(D) Calcium — middle lamella of cell wall

**111.** Which among the following represents amidation during nitrogen fixation in plants?

(A) $\alpha$-Ketoglutaric acid $+ NH_4^+ + NADPH_2 \rightarrow$ Glutamic acid $+ H_2O + NADP$
(B) Glutamic acid $+$ oxaloacetic acid $\rightarrow \alpha$-Ketoglutaric acid $+$ Aspartic acid
(C) Glutamic acid $+ NH_4^+ +$ ATP $\rightarrow$ glutamine $+$ ADP
(D) $2NH_3 + 3O_2 \rightarrow 2HNO_2 + 2H_2O$

**112.** Total number of ATP molecules utilised in one glycolytic pathway is _____.

(A) 2
(B) 4
(C) 6
(D) 8

**113.** Glycolysis occurs in _____

(A) mitochondrion
(B) peroxisome
(C) cytoplasm
(D) nucleus

**114.** The ultimate electron acceptor in ETS in aerobic respiration is _____ and it reacts with protons to form _____.

(A) Cytochrome a, water
(B) Molecular oxygen, metabolic water
(C) Glucose, Carbon dioxide
(D) Hydrogen, acetaldehyde

**115.** Given below are two statements:
Statement (I): There is accumulation of lactic acid in skeletal muscles during vigorous exercise.
Statement (II): Lactic acid is reconverted into pyruvic acid during resting stage of skeletal muscles.
In light of the above statements, choose the *most appropriate* answer from the options given below.

(A) Both Statement (I) and Statement (II) are correct.
(B) Both Statement (I) and Statement (II) are incorrect.
(C) Statement (I) is correct but Statement (II) is incorrect.
(D) Statement (I) is incorrect but Statement (II) is correct.

**116.** Gibberellins promote bolting prior to flowering in plants like _____.

(A) tomato
(B) cabbage
(C) apple
(D) pear

**117.** Intrinsic plasticity is observed in the leaves of _____.

(A) coriander
(B) butter cup
(C) *Hibiscus*
(D) mango

**118.** Geometric growth can be expressed mathematically by the equation $W_1 = W_0e^{rt}$. '$W_1$' stands for _____.

(A) initial size
(B) final size
(C) time of growth
(D) growth rate

**119.** The hardest substance of human body is _____

(A) enamel
(B) dentin
(C) cementum
(D) histone

**120.** Vitamin $B_{12}$ is synthesised in (A) and intrinsic factor present in (B) helps in absorption of vit $B_{12}$ from food.

(A) (A) - Stomach ; (B) - Bile juice
(B) (A) - Liver; (B) – Gastric juice
(C) (A) - Liver ; (B) Succus entericus
(D) (A) - Duodenum ; (B) - Pancreatic juice

**121.** Given below are two statements.
Statement I - Degradation of fats increases formation of ketone bodies in diabetes insipidus.
Statement II - Entero-gastrone slows gastric contractions and inhibits secretion of gastric juice.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**122.** Which one of the following is NOT the role of bile?

(A) Emulsification of fat
(B) Activation of lipid digesting enzymes
(C) Imparting colour to faecal matter
(D) Secretion of trypsinogen enzyme.

**123.** Absorption of Aspirin takes place in _____.

(A) stomach
(B) mouth
(C) small intestine
(D) large intestine

**124.** Given below are two statements.
Statement I - Portal area is present at the junction of adjacent hepatic lobules.
Statement II - Portal area shows presence of hepatic cords, sinusoid and Kupffer cells.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**125.** The oxyhaemoglobin dissociation curve shifts towards left due to increase in _____.

(A) pH
(B) temperature
(C) DPG
(D) $ppCO_2$

**126.** _____ is a common respiratory illness characterized by inflammation of the lungs, cough and fever, chills, shortness of breath.

(A) Sinusitis
(B) Bronchitis
(C) Laryngitis
(D) Pneumonia

**127.** Which of the following statements are correct?
(A) Intrathoracic pressure decreases during inspiration.
(B) Activation of pneumotaxic center stimulates inspiration.
(C) During expiration, pressure gradient operates from lungs to the atmosphere.
(D) Cavity of lungs decreases during expiration.
(E) Diaphragm contracts during expiration.
Select the correct option

(A) C, D and E only
(B) A and B only
(C) A, C and D only
(D) D and E only

**128.** Select the INCORRECT statement.

(A) Blood pressure is directly proportional to the viscosity of blood.
(B) In women, usually the BP increases after menopause.
(C) The hormone ADH reduces BP.
(D) Blood loss in an accident decreases the BP.

**129.** Given below are two statements.
Statement I - Acidophils secrete histamines.
Statement II - Cyanophils show anti-histaminic property.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**130.** With reference to human plasma, select the CORRECT match.

(A) Anticoagulant – Prothrombin
(B) Regulators - Antibodies
(C) Waste - Heparin
(D) Protein - Properdin

**131.** Select the INCORRECT statement with reference to silent heart attack.

(A) It is also known as silent myocardial infarction.
(B) Extreme chest pain, hypertension and shortness of breath are not seen in the patient.
(C) Extreme chilling is experienced.
(D) The patient feels discomfort.

**132.** Haemolytic disease of the new born can occur in case a _____.

(A) Rh+ve woman marries Rh-ve man.
(B) Rh-ve woman marries Rh+ve man.
(C) Rh+ve woman marries O+ve man.
(D) Rh-ve woman marries O-ve man.

**133.** In Birds, ammonia is converted into 'A' in 'B' by 'C' and excreted through kidney.
Identify A, B and C

(A) A- uric acid, B-pancreas and C-urea cycle.
(B) A- urea, B-kidney and C-ornithine cycle
(C) A- urea, B-liver and C-Krebs cycle
(D) A- uric acid, B-liver and C-inosinic acid pathway

**134.** Counter current multiplier system occurs between _____ and _____.

(A) Loop of Henle and Bowman's Capsule
(B) Vasa recta and Loop of Henle
(C) Collecting ducts and Loop of Henle
(D) Vasa recta and glomerulus

**135.** Urethral internal sphincter present between urinary bladder and urethra is made up of _____ muscles and is _____ in nature.

(A) skeletal and involuntary
(B) smooth and involuntary
(C) skeletal and voluntary
(D) smooth and voluntary

**136.** Which one of the following pair is ammonotelic?

(A) Birds and protozoa
(B) Spiders and molluscs
(C) Land snails and protozoa
(D) Aquatic invertebrates and bony fishes

**137.** Match the pair.

| Column I (Type of pressure during ultrafiltration) | Column II (values) |
|---|---|
| (A) Glomerular hydrostatic pressure | (I) 30 mm of Hg |
| (B) Opposing osmotic pressure of blood | (II) 15 mm of Hg |
| (C) Opposing capsular pressure | (III) 10 mm of Hg |
| (D) Net filtration pressure | (IV) 55 mm of Hg |

Choose the correct option

(A) A - IV, B - I, C - III, D - II
(B) A - IV, B - II, C - I, D - III
(C) A - IV, B - III, C - II, D - I
(D) A - IV, B - I, C - II, D - III

**138.** Given below are two statements.
Statement I - The lens and cornea divide the cavity of eyeball into two chambers.
Statement II - The ability of the lens by which the light rays from far or near objects are focused on the retina is called accommodation.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**139.** Select the INCORRECT statement regarding cerebrum from the following.

(A) Cerebral cortex is made up of grey matter and white matter lies inside it.
(B) Gyri and sulci of cerebral cortex increase surface area of grey matter.
(C) Two lateral ventricles are connected to diocoel by the duct of Sylvius.
(D) Grey matter shows presence of cell bodies, dendrons and non medullated fibres.

**140.** Which one of the following nerves is NOT a part of Dentist's nerve?

(A) Ophthalmic
(B) Maxillary
(C) Abducens
(D) Mandibular

**141.** The cranial nerve III is _____.

(A) Facial
(B) Trigeminal
(C) Oculomotor
(D) Vagus

**142.** Rate of saltatory conduction of nerve impulse in mammalian myelinated nerve fibers is _____.

(A) 120 m/sec
(B) 100 m/sec
(C) 60 m/sec
(D) 20 m/sec

**143.** Which of the following is NOT a symptom of Cushing's disease?

(A) High BP
(B) Obesity
(C) Glucosuria
(D) Natriuresis

**144.** Human ovary secretes _____ types of hormones.

(A) 2
(B) 3
(C) 4
(D) 5

**145.** Which one of the following is NOT endodermal in origin?

(A) Thymus gland
(B) Thyroid gland
(C) Parathyroid gland
(D) Pineal gland

**146.** Which one of the following statements is CORRECT with reference to hypophyseal portal vein?

(A) It starts with hypothalamus and ends into neurohypophysis.
(B) It starts with hypothalamus and ends into adenohypophysis.
(C) It starts with hypophysis and ends into hypothalamus.
(D) It starts with hypophysis and ends into heart via superior vena cava.

**147.** If the osmolarity of blood increases due to sweating, osmoreceptors trigger release of _____ .

(A) renin from JGA
(B) ADH from neurohypophysis
(C) ANP from Heart
(D) calcitriol from kidney

**148.** Select the correct statement.

(A) In *Hydra*, the bud is developed within the body.
(B) In *Spongilla*, internal bud develops during favourable season.
(C) Corals reproduce asexually by formation of gametes.
(D) The process of budding is observed in some ascidians.

**149.** The process of sexual reproduction in animals involves

(A) meiosis only
(B) mitosis only and fusion of gametes to form a diploid zygote
(C) meiosis and fusion of gametes to form diploid zygote
(D) mitosis only

**150.** Given below are two statements.
Statement I - Intine is made up of cellulose and pectin.
Statement II - In most of the angiospermic plants, the pollen grains are shed from the anther at 2-celled stage.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**151.** Which one of the following does NOT promote cross pollination?

(A) Herkogamy
(B) Self sterility
(C) Heteromorphy
(D) Cleistogamy

**152.** In an ovule, one of the male gamete fuses with haploid female gamete to produce a diploid zygote, the process is called

(A) chalazogamy
(B) mesogamy
(C) syngamy
(D) siphonogamy

**153.** Match type of outbreeding device given in Column I with respective example given in Column II

| **Column (I)** | **Column (II)** |
|---|---|
| (A) Protogyny | (I) *Calotropis* |
| (B) Herkogamy | (II) *Primula* |
| (C) Self sterility | (III) *Gloriosa* |
| (D) Heterostyly | (IV) *Thea* |

Choose the correct option

(A) A - III, B - IV, C - II, D - I
(B) A - III, B - I, C - II, D - IV
(C) A - III, B - I, C - IV, D - II
(D) A - II, B - III, C - IV, D - I

**154.** Match type of pollinating agent given in Column I with respective example given in Column II

| **Column (I)** | **Column (II)** |
|---|---|
| (A) Sunbirds | (I) Chiropterophily |
| (B) Bats | (II) Entomophily |
| (C) Insects | (III) Ornithophily |

Choose the correct option

(A) A - II, B - III, C - I
(B) A - III, B - II, C - I
(C) A - III, B - I, C - II
(D) A - I, B - III, C - II

**155.** The prostate gland is composed of _____ lobes.

(A) 5 - 10
(B) 10 - 15
(C) 20 - 30
(D) 35 - 45

**156.** The secretion of estrogen is carried out by the _____ under the influence of FSH.

(A) Primordial follicle
(B) Secondary follicle
(C) Primary follicle
(D) Oogonia

**157.** Complete the following analogy:
Cu-T : Suppress sperm motility
LNG-20 : _____

(A) Phagocytosis of sperms
(B) Makes cervix hostile to the sperm
(C) Inhibition of ovulation
(D) Alters the quality of cervical mucus

**158.** Deficiency of clotting factor VIII or IX in the blood causes _____.

(A) thalassemia
(B) sickle-cell anaemia
(C) nephritis
(D) haemophilia

**159.** Hypertrichosis is _____ character.

(A) X - linked
(B) Y - linked
(C) autosomal dominant
(D) autosomal recessive

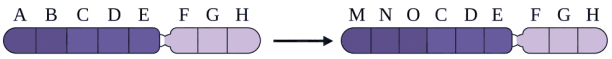
**160.** Which type of sex determination is seen in honey bees?

(A) ZZ-ZW type
(B) XX male - XY female type
(C) Haplo-diploid type
(D) XX female - XY male type

**161.** Which one of the following disorder shows symptoms of excess of phenylalanine in urine of humans?

(A) Albuminuria
(B) Gout arthritis
(C) Urinary tract infection
(D) Phenylketonuria

**162.** Identify the chromosomal aberration from the given diagram




(A) Deletion
(B) Duplication
(C) Inversion
(D) Translocation

**163.** Given below are two statements.
Statement I - Only males can suffer from haemophilia.
Statement II - The gene for normal clotting of blood in human is recessive.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**164.** Given below are two statements.
Statement I - RNA acts as biocatalyst and catalytic RNA is ribozyme.
Statement II - Due to repeated replication and mutation, varieties of RNA molecules of varying sizes are formed.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**165.** Along with Histone like DNA binding proteins which enzyme maintains supercoiled state in packaging of DNA in prokaryotes?

(A) DNA polymerase and RNA primase
(B) DNA ligase and helicase
(C) DNA gyrase and topoisomerase I
(D) Phosphorylase and RNA polymerase

**166.** The repressor protein in lac operon is produced by the action of _____.

(A) operator gene
(B) regulator gene
(C) promoter gene
(D) structural gene

**167.** In protein synthesis, during elongation of a polypeptide chain, the charged tRNA carrying the aminoacid is received at ___ site and uncharged tRNA is released from ___ site of the ribosome respectively.

(A) 'A' and 'P'
(B) 'P' and 'A'
(C) 'A' and 'E'
(D) 'P' and 'E'

**168.** During replication the enzyme that forms double helix to form daughter DNA molecule is _____.

(A) topoisomerase
(B) ligase
(C) permease
(D) helicase

**169.** If the number of adenine nitrogenous base in a given DNA segment is 25 and the number of guanine is 45, What would be the total number of nucleotides in that segment?

(A) 50
(B) 70
(C) 90
(D) 140

**170.** The nucleotide sequence of anticodon is complementary to nucleotide sequence present on_____.

(A) DNA (B) tRNA
(C) mRNA (D) rRNA

**171.** Correct sequence of epochs of coenozoic era from ancient to recent is _____.

(A) Miocene, Pliocene, Palaeocene, Pleistocene
(B) Pleistocene, Pliocene, Oligocene, Miocene
(C) Pliocene, Pleistocene, Oligocene, Miocene
(D) Oligocene, Miocene, Pliocene, Pleistocene

**172.** Identify the fossil of man who showed following characteristics.
A) Cranial capacity is 900 cc
B) Fossil was obtained in Peking
C) Existed about 1.5 mya
In the light of above statements, choose the correct answer.

(A) *Homo erectus* (B) Neanderthal man
(C) *Homo habilis* (D) *Australopithecus*

**173.** Potential mates do not meet though live in same geographic region but occupy separate habitat. This type of isolation is _____.

(A) Ethological (B) Ecological
(C) Temporal (D) Mechanical

**174.** Metastasis is _____

(A) uncontrolled division of cells and formation of lumps of tissue.
(B) spreading of cells from one organ to another via blood.
(C) treatment and prevention of AIDS.
(D) treatment of Cancer by radiation.

**175.** Widal Test is used for diagnosis of _____.

(A) Pneumonia (B) AIDS
(C) Typhoid (D) Malaria

**176.** Which of the following is NOT a vector borne disease?

(A) Malaria (B) Dengue
(C) Filariasis (D) Ascariasis

**177.** Men over 'X' yrs. of age and have daily high consumption of 'Y' have increased risk of prostate cancer.
The 'X' and 'Y' are

(A) 40, carbohydrate (B) 50, vit B
(C) 40, Proteins (D) 50, fat

**178.** In which of the following disorders of bacterial origin, use of vapourizer is recommended?
(A) Pneumonia
(B) Emphysema
(C) Acute bronchitis
(D) Sinusitis
Select the correct option.

(A) B and C only (B) C and D only
(C) A and D only (D) A and C only

**179.** Given below are two statements.
Statement I - There is no need of agitation in callus culture however it is necessary in suspension culture.
Statement II - During tissue culture techniques, the temperature of the lab is maintained between 18 to 20°C.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**180.** Match the object given in Column I with respective sterilizing agent given in Column II

| **Column (I)** | **Column (II)** |
|---|---|
| (A) Nutrient medium | (I) 20% ethyl alcohol treatment |
| (B) Glass wares | (II) autoclaving |
| (C) Explant | (III) use of hot air oven |

(A) A - II, B - I, C - III (B) A - II, B - III, C - I
(C) A - I, B - II, C - III (D) A - III, B - II, C - I

**181.** Which one of the following biofertilizer makes the plant associated with them grow luxuriantly in less irrigated lands?

(A) *Rhizobium* (B) Vesiculo Arbuscular Mycorrhizae
(C) *Anabaena* (D) *Azospirillum*

**182.** Which one of the following pairs is INCORRECTLY matched?

(A) Phosphate Solubilizing bio fertilizer — *Agrobacterium*
(B) Symbiotic nitrogen fixing microbe — *Frankia*
(C) Non symbiotic nitrogen fixing microbe — *Beijerinckia*
(D) Free living mycoherbicide — *Bacillus thuringiensis*

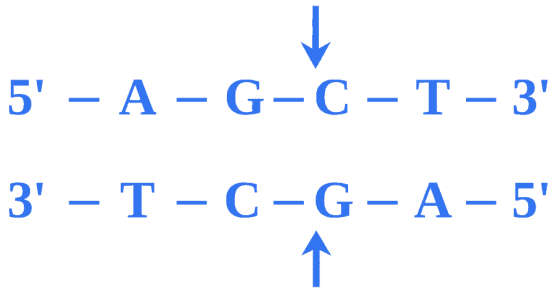
**183.** Dosa, Dhokla and Idli are the fermented preparations of rice and black Gram with _____ species of bacteria.

(A) *Leuconostoc* and *Streptococcus*
(B) *Lactobacillus* and *Streptococcus*
(C) *Bacillus* and *Streptomyces*
(D) *Pseudomonas* and *Streptomyces*

**184.** In genetic engineering, the term chimeric DNA is applied to _____.

(A) passenger DNA
(B) vehicle DNA
(C) rDNA
(D) complementary DNA

**185.** The restriction endonuclease responsible for cleaving the given restriction site is _____.




(A) Alu I
(B) Bam HI
(C) Eco RI
(D) Hind II

**186.** The enzyme Taq polymerase during PCR cycle is actually involved in which of the following steps?

(A) Both denaturation and annealing
(B) Both annealing and primer extension
(C) Annealing only
(D) Primer extension only

**187.** 'PAGE, SDS PAGE' are the methods of which of the following?

(A) Electrophoresis
(B) PCR
(C) Fermentation
(D) Traditional biotechnology

**188.** Given below are two statements.
Statement I - In germline gene therapy, the healthy genes are introduced into germ cells like sperms, eggs and early embryo for the transmission of modified genetic information to the next generation.
Statement II - Somatic cell gene therapy is the only feasible option for the treatment of acquired disorders such as cancer, rheumatoid arthritis and thalassemia etc.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**189.** Which one of the following is NOT an example of prey-predator interaction?

(A) Sparrows and seeds
(B) Frogs and Locusts
(C) Monarch butterfly and birds
(D) Clown fish and sea anemone

**190.** Density of population of a species decreases in case of which of the following phenomena?
A. Increase in immigration
B. Decrease in birth rate
C. Decrease in emigration
D. Increase in death rate.

(A) A and B only
(B) B and C only
(C) B and D only
(D) C and D only

**191.** In a population, the most common evolutionary stable strategy for a sex ratio is when _____.

(A) Number of males exceeds the number of females.
(B) Number of females exceeds the number of males.
(C) males and females are in a ratio of 1:1
(D) females are economically independent from males.

**192.** Basic unit of ecological hierarchy is _____.

(A) Biome
(B) Community
(C) Population
(D) Organism

**193.** Which one of the following is a sedimentary ecological cycle?

(A) Carbon
(B) Nitrogen
(C) Phosphorus
(D) Oxygen

**194.** Choose the INCORRECT statement with respect to Pyramid of energy.

(A) When energy flows from a particular trophic level to the next trophic level, some energy is always lost as heat at each step.
(B) In smaller food chains, more energy is available than in the longer food chains.
(C) Energy increases while passing from producers to consumers.
(D) It is never inverted.

**195.** Which one of the following processes does NOT help in nutrient cycling?

(A) Photosynthesis
(B) Respiration
(C) Decomposition
(D) Evaporation

**196.** Given below are two statements.
Statement I - Exchange of phosphorus between organism and the environment is very high.
Statement II - Atmospheric inputs of carbon through rainfall are much smaller than phosphorus.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.
(B) Both statement I and statement II are incorrect.
(C) Statement I is correct but statement II is incorrect.
(D) Statement I is incorrect but statement II is correct.

**197.** Which one of the following is NOT a biodiversity hot spot in India?

(A) Eastern Himalayas
(B) Western Ghats
(C) Indo-Burma region
(D) Rann of Kutch

**198.** Which of the following are sacred groves found in India?
A. Khasi and Jaintia Hills in Meghalaya.
B. Western Ghat regions of Maharashtra
C. Aravalli Hills of Rajasthan
D. Ladakh region of Himalayas
E. Chanda and Sarguja areas of Madhya Pradesh
Choose the correct option given below:

(A) A, B and C only
(B) A, B and E only
(C) A, B, C and D only
(D) A, B, C and E only

**199.** Which one of the following is also known as 'Terror of Bengal'?

(A) Tiger
(B) *Eichhornia crassipes*
(C) Carrot grass
(D) *Commelina benghalensis*

**200.** The water hyacinth (*Eichhornia crassipes*) is a native of _____.

(A) Central Europe
(B) Central Africa
(C) Amazon basin
(D) South Africa

**- End of Question Paper -**