MHT CET 2026 PCB Apr 21 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. The resultant of two vectors $\vec{A}$ and $\vec{B}$ is perpendicular to $\vec{A}$ and the magnitude is $\frac{1}{\sqrt{2}}$ times that of $\vec{B}$. The angle between $\vec{A}$ and $\vec{B}$ is

(A) 45° (B) 135°

(C) 90° (D) 120°

2. If two projectiles are projected with equal velocities at angles which are complementary to each other, then

(A) Heights attained by the projectiles are equal.

(B) The total time of flights are equal.

(C) The range of projectiles are equal.

(D) Their trajectories are equal

3. A man weighing 60 kg is standing in a lift. If the lift moves with an acceleration of $'x'\ \mathrm{m/s^2}$, the apparent weight of the man is 840 N. The acceleration $'x'$ of the lift is such that ($g = 10\ \mathrm{m/s^2}$)

(A) The lift ascends with an acceleration of 4 $\mathrm{m/s^2}$

(B) The lift descends with an acceleration of 4 $\mathrm{m/s^2}$

(C) The lift descends with an acceleration of 2 $\mathrm{m/s^2}$

(D) The lift ascends with an acceleration of 2 $\mathrm{m/s^2}$

4. If a road is banked at an angle θ, and the cyclist is leaning inward at an angle θ' to the vertical, for an ideal turn at the optimum speed, what is the relationship between the angles?

(A) $\theta' > \theta$ (B) $\theta' < \theta$

(C) θ' is always 90° (D) $\theta' = \theta$

5. A particle 'A' of mass ' 2m' and having initial velocity $'u'_A$ collides with particle B of mass ' m / 2' at rest. The collision is head on and elastic. If λ_A and λ_B are the de-Broglie wavelength of the particles 'A' and 'B' after collision, such that $\lambda_A = x\lambda_B$. The value of x is

(A) $\frac{2}{3}$ (B) $\frac{1}{2}$

(C) 1 (D) $\frac{1}{3}$

6. A thin uniform rod of mass 'M' and length 'L' lies in a x-y plane. Its centre is at the origin $(0, 0)$ and is oriented along the x-axis. What is the moment of inertia of this rod about an axis passing through point $(0, 2L/3)$ parallel to z- axis and perpendicular to the plane.

(A) $\frac{36}{19}ML^2$ (B) $\frac{2}{3}ML^2$

(C) $\frac{19}{36}ML^2$ (D) $\frac{3}{2}ML^2$

7. A thin circular ring of mass 'M' and radius 'r' is rotating about its axis with a constant angular velocity ω. Four objects, each of mass 'M / 2', are kept gently to the opposite ends of two perpendicular diameters of ring. The angular velocity of the ring will be

(A) $\omega/3$ (B) $\omega/2$

(C) 3ω (D) ω

8. An artificial satellite is revolving around a planet in a circular orbit close to its surface. The frequency of revolution (n) of a satellite in terms of density 'ρ' and radius 'R' of the planet is (G is the universal gravitational constant)

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

(C) $\sqrt{\frac{3\pi}{G\rho}}$ (D) $\sqrt{\frac{2\pi}{G\rho}}$

9. The cylindrical tube of a spray pump has radius 'R', one end of which has 'n' fine holes, each of radius 'r'. If the speed of the liquid in the tube is 'V' and speed of ejection of the liquid through the holes is 'V_1' and $r = xR$, then value of x is

(A) $\sqrt{\frac{nV_1}{V}}$ (B) $\sqrt{\frac{V}{nV_1}}$

(C) $n\sqrt{\frac{V}{V_1}}$ (D) $\frac{1}{n}\sqrt{\frac{V}{V_1}}$

10. In a capillary tube having the cross-sectional area 'A', the water rises to a height $'h'_1$. If the cross-sectional area is reduced by 'A/25', the rise of water in capillary is $'h'_2$. If $h_2 = xh_1$, the value of x is

(A) $\frac{2\sqrt{6}}{5}$ (B) $\frac{5}{2\sqrt{6}}$

(C) $\frac{\sqrt{6}}{5}$ (D) $\frac{5}{\sqrt{6}}$

11. The atmospheric pressure on the surface of the fluid is P_0 . The depth h at which pressure is n times the atmospheric pressure is

(A) $\frac{nP_0}{\rho g}$ (B) $\frac{(n+1)P_0}{\rho g}$

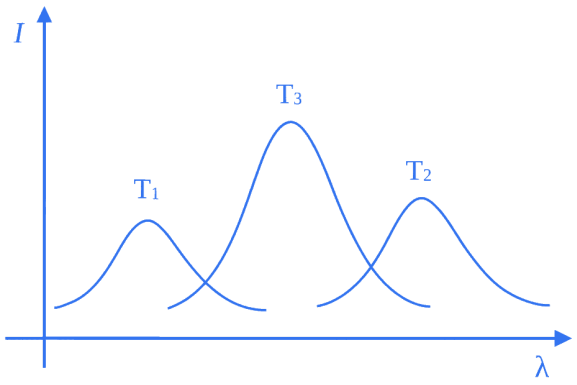
(C) $\frac{(n-1)P_0}{\rho g}$ (D) $\frac{n^2P_0}{\rho g}$

12. The thermal conduction rate 'P_{cond}' of a slab is given by $P_{cond} = \frac{kA(T_1-T_2)}{x}$, where ' x ' is the thickness of the slab and 'A' is the area . The term that represents thermal resistance ' R_T'

(A) $\frac{kA}{x}$ (B) $\frac{x}{kA}$

(C) $\frac{k(T_1-T_2)}{x}$ (D) $\frac{x}{k(T_1-T_2)}$

13. The plots of intensity against wavelength for three black bodies at temperatures T_1, T_2 and T_3 are as shown. The wavelengths λ_1, λ_2 and λ_3 at which their intensities are maximum are such that



(A) $\lambda_1 > \lambda_3 > \lambda_2$ (B) $\lambda_1 > \lambda_3 < \lambda_2$

(C) $\lambda_1 < \lambda_3 > \lambda_2$ (D) $\lambda_1 < \lambda_3 < \lambda_2$

14. For an adiabatic process, choose the correct relation

(A) $PT^{\gamma} = \text{constant}$ (B) $P^{1-\gamma}T^{\gamma} = \text{constant}$

(C) $P^{\gamma}T^{\gamma} = \text{constant}$ (D) $P^{\gamma}T^{1-\gamma} = \text{constant}$

15. For a cyclic thermodynamic process

(A) $Q = -W$ and $\Delta U \neq 0$ (B) $Q = 0$ and $\Delta U = 0$

(C) $Q \neq 0, \Delta U \neq 0$ (D) $Q = W$ and $\Delta U = 0$

16. A vessel is filled with a gas at a pressure of 76 cm of mercury at a certain temperature. The mass of the gas is increased by 75 % by introducing more gas in the vessel at the same temperature. The resultant pressure of the gas is

(A) 76 cm of mercury (B) 108 cm of mercury

(C) 57 cm of mercury (D) 133 cm of mercury

17. C_p and C_v are the specific heats at constant pressure and constant volume respectively. It is observed that $C_p - C_v = a$ for hydrogen gas and $C_p - C_v = b$ for carbon dioxide gas. The correct relationship between ' a' and 'b' is (atomic weight of hydrogen , carbon and oxygen are 1u, 12 u and 16 u respectively)

(A) $a = b$ (B) $a = 22\ b$

(C) $a = 44\ b$ (D) $a = \frac{1}{14b}$

18. The displacement of two identical particles performing S.H.M are represented by equation $x_1 = 6\ \sin(5t + \pi/4)$ and $x_2 = 4\ \cos\omega t$. The energies of both the particles will be same, if the value of ω is

(A) 9.5 unit (B) 6.5 unit

(C) 8.5 unit (D) 7.5 unit

19. The bob of simple pendulum performs S.H.M. with a frequency $'n'$ in air and with frequency $'n_1'$ in water. If the density of the material of bob is $'x'$ g / cc and the ratio n/n_1 is 3, then density of bob $'x'$ is (density of water $= 1$ g /cc and neglect friction due to water)

(A) $\frac{8}{9}$ (B) $\frac{9}{8}$

(C) $\frac{10}{9}$ (D) $\frac{9}{10}$

20. For a particle executing simple harmonic motion , which of the following statements is NOT correct?

(A) The magnitude of acceleration is directly proportional to displacement.

(B) The restoring force is always directed towards fixed point.

(C) The restoring force is maximum at extreme position.

(D) The acceleration of the particle is maximum at equilibrium position.

21. A sound wave travels from a region of air at 20°C into a region at 40°C. What is the ratio of the wavelengths $(\lambda_{40}/\lambda_{20})$, if the frequency remains constant?

(A) $\sqrt{\frac{313}{293}}$ (B) $\frac{313}{293}$

(C) $\sqrt{\frac{40}{20}}$ (D) $\frac{40}{20}$

22. An object of specific gravity ρ is hung from a thin steel wire. The fundamental frequency for the transverse stationary waves is 300 Hz. The object is immersed in water, so that one half of its volume is submerged. The second harmonic frequency will be (density of water = 1 g / cc)

(A) $600\left(\frac{2\rho-1}{2\rho}\right)^{1/2}$ (B) $600\left(\frac{2\rho}{2\rho-1}\right)^{1/2}$

(C) $600\left(\frac{\rho-1}{2\rho}\right)^{1/2}$ (D) $600\left(\frac{\rho}{2\rho-1}\right)^{1/2}$

23. A hollow pipe of length 0.8 m is closed at one end. At its open end a 0.5 m long uniform string is vibrating in fourth harmonic, and it resonates with the fundamental frequency of the pipe. If the tension in the wire is 50 N and the speed of sound is 320 m/s, the mass of string is

(A) 5 g (B) 40 g

(C) 20 g (D) 10 g

24. A transverse wave is described by the equation $y = A\sin 2\pi\left(nt - \frac{x}{10}\right)$. The ratio of maximum particle velocity to wave velocity is

(A) $\frac{\pi A}{5}$ (B) $\frac{2\pi A}{5}$

(C) $\frac{3\pi A}{5}$ (D) $\frac{4\pi A}{5}$

25. Three point charges $+4e$, $+2e$ and $+e$ are kept at each vertex of an equilateral triangle ABC , each of side a . The net electric intensity acting on charge $+e$ is
($\cos 60^\circ = 1/2$ and k is constant)

(A) $\frac{2\sqrt{7}ke}{a^2}$ (B) $\frac{4\sqrt{7}ke}{a^2}$

(C) $\frac{7\sqrt{2}ke}{a^2}$ (D) $\frac{\sqrt{7}ke}{a^2}$

26. The electric potential due to a dipole at point P making an angle 120° with the axis of a dipole is
(ε_0 = permittivity of free space, p = electric dipole moment , r = distance of point P from the center of dipole)
$(\cos 60^\circ = 1/2)$

(A) $\frac{1}{8\pi\varepsilon_0}\frac{p}{r^2}$ (B) $\frac{-1}{8\pi\varepsilon_0}\frac{p}{r^2}$

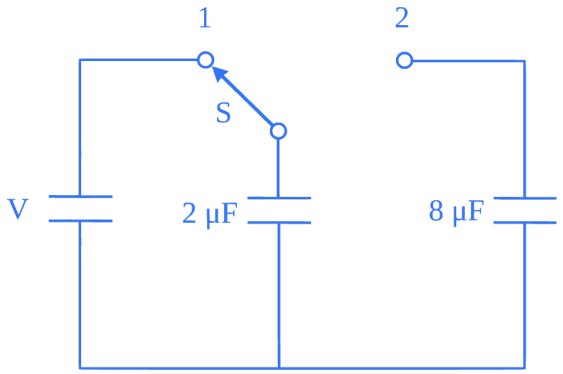
(C) $\frac{-1}{8\pi\varepsilon_0}\frac{3p}{r^2}$ (D) $\frac{1}{8\pi\varepsilon_0}\frac{3p}{r^2}$

27. The electric potential ' V ' at a radial distance x just outside a non-conducting sphere is $\frac{\rho R^2}{2\varepsilon_0 x}$. The electric intensity ' E ' at a radial distance x is (ρ is uniform volume charge density, R is the radius of the sphere and ε_0 is the permittivity of free space)

(A) $\frac{\rho R^2}{2\varepsilon_0 x}$ (B) $\frac{\rho R^2}{3\varepsilon_0 x^2}$

(C) $\frac{\rho R^2}{2\varepsilon_0 x^2}$ (D) $\frac{\rho R^2}{\varepsilon_0 x^2}$

28. A capacitor of 2 μF is charged as shown in the diagram. When the switch 'S' is turned to position 2, the percentage of its stored energy dissipated is



(A) 10 % (B) 20 %

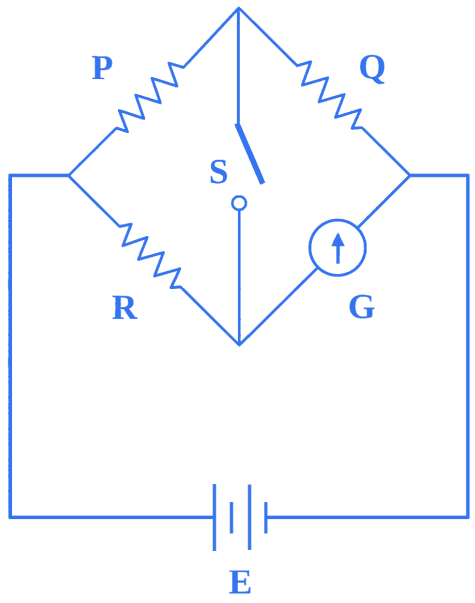
(C) 75 % (D) 80 %

29. A galvanometer of resistance 90 Ω is shunted by a resistance of 10 Ω. The fraction of main current that passes through shunt is

(A) 9/10 (B) 9/100

(C) 1/100 (D) 1/10

30. In a Wheatstone's network $P \neq R$, the reading of the galvanometer is the same with a switch 'S' open or closed. Then



(A) $I_R = I_G$ (B) $I_P = I_G$

(C) $I_Q = I_G$ (D) $I_Q = I_R$

31. A circular loop carrying a current' I' is made of a wire of length 'L'. A uniform magnetic field 'B' exists parallel to the plane of the loop. The torque experienced by the circular loop will be

(A) ILB (B) Zero

(C) $\frac{IL^2B}{2\pi}$ (D) $\frac{IL^2B}{4\pi}$

32. The magnetic field inside the solenoid is

(A) directly proportional to its length. (B) directly proportional to current

(C) inversely proportional to current (D) inversely proportional to total number of turns

33. Magnetic susceptibility (χ) is related to magnetic relative permeability (μ_r) by the relation

(A) $\chi = 1/(\mu_r - 1)$ (B) $\chi = \mu_r + 1$

(C) $\chi = \mu_r - 1$ (D) $1/(\mu_r + 1)$

34. The current in a primary coil of a step-down transformer having N_p turns is given by $i = i_0 \cos \omega t$. The secondary coil having N_s turns is wound over the primary coil. The emf induced in the secondary is

(A) $\frac{Mi_0}{\omega} \sin \omega t$ (B) $\omega^2 Mi_0 \sin \omega t$

(C) $-\omega Mi_0 \sin \omega t$ (D) $\omega Mi_0 \sin \omega t$

35. A metallic rod of length 'l' is tied to a string of length '$2l$' and made to rotate with angular speed '2ω' on a horizontal table with one end of the string fixed. If there exists a vertical magnetic field 'B' in the region, the emf 'e' induced across the ends of rod is

(A) $5B\omega l^3$ (B) $\frac{3}{2}B\omega l^3$

(C) $2\ B\omega l^2$ (D) $5B\omega l^2$

36. Identify the CORRECT statement

(A) The direction of eddy currents can be determined by the Left-Hand Rule. (B) Eddy currents always perform useful work and increase the efficiency of all electrical devices.

(C) Eddy currents circulate in planes perpendicular to the magnetic field that induces them. (D) Eddy currents are present only in non-magnetic materials like aluminum

37. In series LCR circuit the alternating emf 'e' and the current 'i' are given by the equations $e = e_0 \cos \omega t$, $i = i_0 \sin\left(\omega t + \frac{\pi}{6}\right)$. The average power dissipated in the circuit over a one complete cycle of A.C is $(\cos 60 = 1/2)$

(A) $\frac{e_0 i_0}{2}$ (B) $\frac{e_0 i_0}{4}$

(C) $\sqrt{\frac{3}{2}} e_0 i_0$ (D) Zero

38. A resistance 'R' draws a power 'P' when connected to A.C. source. If an inductor is now placed in series with the resistance, such that the impedance of the circuit becomes 'Z', the power drawn is 'P_1''. The ratio of P_1/P is

(A) $\left(\frac{R}{Z}\right)^2$ (B) $\sqrt{\frac{R}{Z}}$

(C) $\frac{R}{Z}$ (D) 1

39. The r.m.s value of current in a 50 Hz A.C. circuit is 10 A. The average value of A.C. current over a cycle is

(A) Zero
(B) 10 A
(C) 7.072 A
(D) 14.14 A

40. Three beams of blue, green and orange colour are made to pass separately through a prism . In the position of minimum deviation, the angle of refraction will be (the angle of prism is 60°)

(A) 30° for blue , green and orange colour
(B) 30° only for blue colour
(C) 30° only for green colour
(D) 30° only for orange colour

41. In an experiment to measure the power of a convex lens, the least count of measuring scale for the position of object u and the position of image v are Δu and Δv respectively. The error ΔP in measurement of power of a convex lens will be

(A) $\frac{\Delta v}{v^2}+\frac{\Delta u}{u^2}$
(B) $\frac{\Delta v}{v}+\frac{\Delta u}{u}$
(C) $\frac{1}{\frac{\Delta u}{v}+\frac{\Delta u}{u}}$
(D) $\frac{1}{\frac{\Delta u}{v^2}+\frac{\Delta u}{u^2}}$

42. An unpolarized beam of light having flux 10^{-2} W falls normally on a rotating polarizer of cross-sectional area 3×10^{-4} m^2. If the energy of light passing through the polarizer per revolution is 10^{-2} J, then the polarizer is rotating with the angular frequency of

(A) π rad/s
(B) 2π rad/s
(C) 3π rad/s
(D) $\frac{\pi}{2}$ rad/s

43. The equation of two interfering light waves are
$y_1=b\cos\omega t$ and $y_2=b\sin(\omega t+\Phi)$.
If the light waves interfere destructively, then the possible value of Φ are

(A) $\frac{3\pi}{2},\frac{5\pi}{2},\frac{13\pi}{2},\ldots\ldots$
(B) $\frac{3\pi}{2},\frac{7\pi}{2},\frac{13\pi}{2},\ldots$
(C) $\frac{3\pi}{2},\frac{7\pi}{2},\frac{11\pi}{2},\ldots\ldots$
(D) $\frac{3\pi}{2},\frac{9\pi}{2},\frac{11\pi}{2},\ldots\ldots$

44. The condition for observing Fraunhofer diffraction from a single slit is that the wavefront incident on a single slit must be

(A) spherical.
(B) plane.
(C) cylindrical.
(D) elliptical.

45. At the stopping potential, the photoelectrons have

(A) kinetic energy $=0$
(B) potential energy $=0$
(C) kinetic energy greater than potential energy
(D) Kinetic energy is maximum

46. The ratio of angular frequency (ω) of an electron to the total energy (E) of an electron in the first orbit of hydrogen atom is (h is the Planck's constant)

(A) $-h/4\pi$
(B) $-4\pi/h$
(C) $-2\pi/h$
(D) $-h/2\pi$

47. The equation ;
$4\,{}_1^1\mathrm{H}\rightarrow{}_2^4\mathrm{He}^{2+}+2\,e^-+26$ MeV
represents

(A) β - decay
(B) γ -decay
(C) fusion
(D) fission

48. Which of the following statements is NOT true?

(A) The resistance of the intrinsic semiconductors decreases with increase in temperature
(B) Doping pure silicon with trivalent impurities gives p - type semiconductor
(C) The majority carriers in n -type semiconductors are holes
(D) p-n junction diode has a negligible resistance in forward bias

49. The components which are used in regulated power supply as rectifier, filter and voltage regulator are

(A) transformer, inductor and capacitor
(B) transformer, capacitor and Zener diode
(C) p-n junction diodes, Zener diode and inductor
(D) p-n junction diode, capacitor and Zener diode

50. Identify the INCORRECT statement

(A) Dark current in photo diode flows only when the photodiode is reverse biased.

(B) Dark current in photo diode is caused by minority carriers flowing across the junction.

(C) Dark current in a photo diode is a small current, typically in the range of picoampere or nanoampere.

(D) Dark current in photo diode is only caused by external background radiation.

51. Which of the following gases has high vapour density at same temperature and pressure?

(A) H_2 (B) O_2
(C) Cl_2 (D) CH_4

52. Which of the following compounds has maximum number of molecules ?

(A) 2 g of H_2 (B) 7 g of N_2
(C) 8 g of O_2 (D) 20 g of NO_2

53. Identify a correct set of quantum numbers that represents the highest energy of an electron in an orbital from following.

(A) $n = 3, l = 0, m_l = 0, s = +1/2$
(B) $n = 3, l = 1, m_l = +1, s = +1/2$
(C) $n = 3, l = 2, m_l = +1, s = +1/2$
(D) $n = 4, l = 0, m_l = 0, s = +1/2$

54. The hydride with lowest acid strength among the following is

(A) H_2Se (B) H_2Te
(C) H_2O (D) H_2S

55. Which orbital overlap produces a σ bond in HCl?

(A) s−s (B) s−p
(C) p−p (D) p−d

56. Calculate the work done when an ideal gas expands from 1×10^{-3} to 1×10^{-2} m^3 at 300 K against constant pressure of 1×10^5 Nm^{-2}.

(A) 900kJ (B) −900kJ
(C) 270kJ (D) −900J

57. Standard enthalpy of vaporization $\Delta_{vap}H^0$ for water at 100°C is 40.66 kJ mol^{-1}. What is the internal energy of vaporization of water at 100°C (in kJ mol^{-1})?

(A) +37.56 (B) −43.76
(C) +43.76 (D) +40.66

58. Which of the following processes exhibits that $\Delta U = Q_v$?

(A) Isothermal (B) Isobaric
(C) Isochoric (D) Adiabatic

59. The degree of dissociation of a monobasic acid in its 0.1M solution at 300 K is 1.342×10^{-2}. Calculate the degree of dissociation of the same acid in its 0.02M solution.

(A) 1.0×10^{-2} (B) 2.0×10^{-2}
(C) 3.0×10^{-2} (D) 4.0×10^{-2}

60. In the washing of precipitates, the wash liquid should contain a common ion with the precipitate for

(A) increasing the ionisation and increasing the solubility
(B) increasing the ionisation and decreasing the solubility
(C) suppressing the ionisation and decreasing the solubility
(D) suppressing the ionisation and increasing the solubility

61. Identify from following an example of Lewis acid.

(A) H_2SO_4 (B) $HClO_4$
(C) CH_3COOH (D) BF_3

62. The oxidation process involves

(A) Increase in oxidation number
(B) Addition of hydrogen
(C) Removal of electronegative element
(D) Gain of electrons

63. Which of the following substance does NOT contain $CaCO_3$?

(A) Marble (B) Chalk
(C) Limestone (D) Slaked lime

64. Which of the following instruments is used to find out absorption of functional groups?

(A) Xray diffractometer
(B) UV-visible spectrophotometer
(C) Scanning electron microscope
(D) Fourier transform Infrared spectrophotometer

65. Which of the following is a gas at room temperature ?

(A) Propanal (B) Acetaldehyde
(C) Formaldehyde (D) Acetone

66. What is IUPAC name of $(CH_3)_3CBr$?

(A) 2-bromopropane
(B) 2-bromo-2-methylpropane
(C) 1-bromobutane
(D) tert-butyl bromide

67. Compare the relative stability of given carbocations.
CH_3-C^+-$(CH_3)_2$ (I) CH_3-C^+H-CH_3 (II) CH_3-C^+H_2 (III)

(A) III > II > I
(B) II > I > III
(C) I > III > II
(D) I > II > III

68. The dihedral angle in the staggered conformation of CH_3CH_3 is

(A) 120°
(B) 60°
(C) 0°
(D) 90°

69. A metal crystallizes in FCC crystal lattice with density 10 g/cm^3. The edge length of unit cell is 100 pm. The number of unit cell present in 100 g of metal is-

(A) 1×10^{22}
(B) 1×10^{23}
(C) 1×10^{24}
(D) 1×10^{25}

70. Potassium forms bcc unit cell structure with edge length of 522 pm. Find the radius of the potassium atom ?

(A) 206 pm
(B) 226 pm
(C) 246 pm
(D) 286 pm

71. Identify from following crystal system that its unit cell possesses edge length $a = b = c$ and angle between these axes $\alpha = \beta = \gamma = 90°$.

(A) Cubic
(B) Orthorhombic
(C) Tetragonal
(D) Monoclinic

72. 13 g nonvolatile solute dissolved in 100 gm of water gives vapour pressure of 27.371 mm Hg at room temperature. Find the molar mass of solute. (vapour pressure of water is 28.065 mm Hg at room temperature)

(A) 0.09474 g/mol
(B) 0.9474 g/mol
(C) 9.474 g/mol
(D) 94.74 g/mol

73. If 1.02% of glycerin is isotonic with a 2% solution of glucose, calculate the molar mass of glycerin if that of glucose is 180g./mol

(A) 93.0
(B) 91.8
(C) 90.2
(D) 96.4

74. What is the molal elevation constant of solvent ?

(A) ratio of boiling point elevation to molarity of solution.
(B) ratio of boiling point elevation to mole fraction of solution.
(C) ratio of boiling point elevation to molarity of solute.
(D) ratio of boiling point elevation to molality of solution.

75. Calculate the emf of the following cell at 25°C
$Zn(s)|Zn^{++}(0.1M) \parallel Cu^{++}(0.05M)|Cu(s)$ if $E°$ cells 1.1V.

(A) 1.091 V.
(B) 1.2 V.
(C) 1.52 V.
(D) 1.41 V

76. The molar conductance of NaCl, HCl and CH_3COONa at infinite dilution are 126.45, 426.16 and 91.0 S $cm^2\ mol^{-1}$ respectively. Calculate the molar conductance of CH_3COOH at infinite dilution?

(A) 540.48 S $cm^2\ mol^{-1}$
(B) 201.28 S $cm^2\ mol^{-1}$
(C) 390.71 S $cm^2\ mol^{-1}$
(D) 698.28 S $cm^2\ mol^{-1}$

77. Which of the following elements has positive standard reduction potential?

(A) Al
(B) Sn
(C) Cu
(D) Zn

78. Which of the following rate law expressions is applicable for hydrolysis of cane sugar?

(A) Rate = $k[C_{12}H_{22}O_{11}]$
(B) Rate = $k[C_{12}H_{22}O_{11}]^0$
(C) Rate = $k[C_{12}H_{22}O_{11}]^2$
(D) Rate = $k[C_{12}H_{22}O_{11}]^{3/2}$

79. For the first order reaction, 80 % of the reactant decomposes in 60 minutes. Calculate the half life of the reaction.

(A) 40 min
(B) 26 min
(C) 35 min
(D) 20 min

80. For the elementary reaction, $A + B \rightarrow$ products. What is the molecularity of the reaction ?

(A) 0
(B) 1
(C) 2
(D) 3

81. Which of the following statements is not true about absorption?

(A) Concentration of the absorbate is uniform through the bulk of the absorbent.

(B) It is independent of temperature and pressure.

(C) It is not accompanied by any evolution or absorption of heat.

(D) It depends on the surface area.

82. Identify the correct order of acidity of the following compounds.

(A) $HClO_2 < HClO < HClO_3 < HClO_4$

(B) $HClO_4 < HClO_2 < HClO < HClO_3$

(C) $HClO_3 < HClO_4 < HClO_2 < HClO$

(D) $HClO < HClO_2 < HClO_3 < HClO_4$

83. Calculate the value of magnetic moment in Cr^{3+}

(A) 1.75 BM

(B) 2.84 BM

(C) 3.87 BM

(D) 4.9 BM

84. Identify the element of first transition series that has the highest melting point.

(A) Vanadium

(B) Chromium

(C) Manganese

(D) Iron

85. What quantity of AgCl is precipitated when one mole of Pentaamminecarbonatocobalt(III) chloride is treated with excess $AgNO_3$ (molar mass = 143.3 g mol^{-1}) solution?

(A) 143.3 g

(B) 72.0 g

(C) 286.6 g

(D) 215.0 g

86. Identify the anionic sphere complex from following.

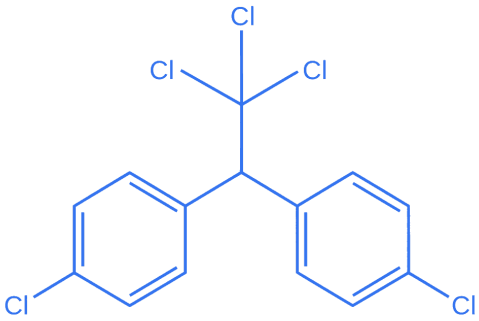
(A) Triamminetrinitrocobalt(III)

(B) Tetramminecopper(II) ion

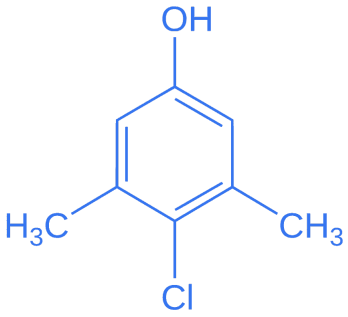
(C) Sodium hexanitrocobaltate(III)

(D) Pentacarbonyliron(0)

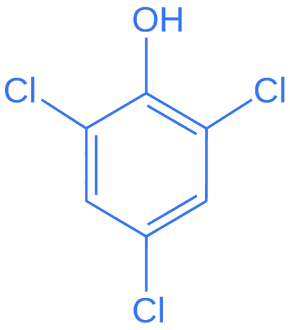
87. Which of the following is the correct structure of DDT ?



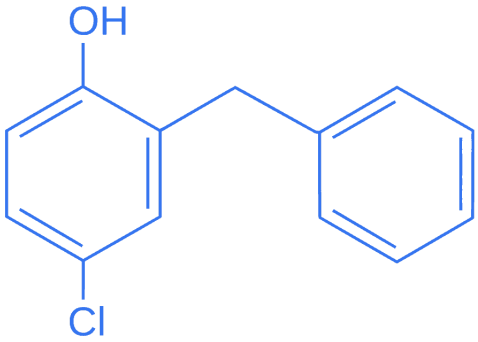
(A)



(B)



(C)



(D)

collegedunia

88. Which of the following reactions is used to prepare salicylaldehyde from phenol ?

(A) Kolbe's reaction
(B) Reimer-Tiemann reaction
(C) Williamson synthesis
(D) Esterification

89. Identify the name of CH_3CH_2OH according to carbinol system .

(A) Methyl carbinol
(B) Ethyl carbinol
(C) Carbinol
(D) Ethanol

90. In the given reaction, the product "Z" is - CH_3-CH(OH)-$CH_3 \xrightarrow{Cu\ /\ 573\ K\ .\ oxidation} Z$

(A) CH_3-CHO
(B) CH_3-CO-CH_3
(C) CH_3-CH=CH_2
(D) CH_3-CH_2-COOH

91. Which of the following reagents is used for converting alcohol to alkyl chloride?

(A) $SOCl_2$
(B) H_2SO_4
(C) HCl only
(D) PCC

92. Identify a catalyst used in Stephen reaction from the following.

(A) $ZnCl_2$ and HCl
(B) $HgCl_2$ and HCl
(C) $SnCl_2$ and HCl
(D) AgCl and HCl

93. Which of the following reactions converts $> C{=}O$ to $> CH_2$?

(A) Rosenmund's reaction
(B) Aldol condensation
(C) Clemmensen's reduction
(D) Wolff–Kishner reduction

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

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

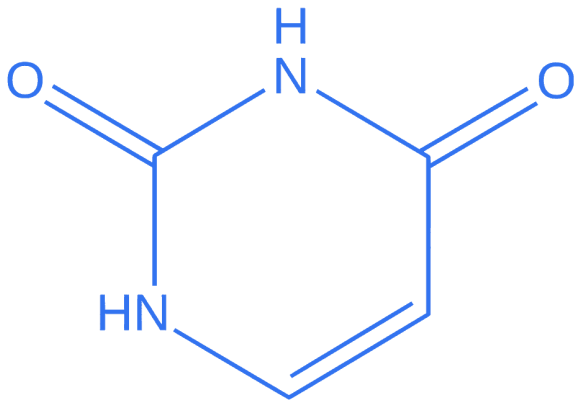
94. Identify the product when ethyl amine reacts with nitrous acid in cold.

(A) $CH_3CH_2NO_2$
(B) CH_3CHO
(C) CH_3CH_2OH
(D) CH_3CH_2NC

95. Identify the reaction that converts CH_3CN to CH_3-CH_2-NH_2 .

(A) Mendius reduction
(B) Hofmann reduction
(C) Clemmensen reduction
(D) Rosenmund reduction

96.



Identify the name of above nitrogen base.

(A) Cytosine
(B) Uracil
(C) Thymine
(D) Guanine

97. Which from followings is true regarding structure of glucopyranose ?

(A) Six membered heterocyclic ring containing five carbon and one oxygen atom
(B) Five membered heterocyclic ring containing four carbon and one oxygen atom
(C) Six membered heterocyclic ring containing six carbon atoms
(D) Five membered homocyclic ring containing five carbon atoms

98. Which of the following statements regarding fats is NOT true?

(A) When fats are kept for longer time, develop rancidity.
(B) Fats are triesters of fatty acids and propane-1,2,3-triol.
(C) Chocolates develop fatty flavour due to release of lauric acid.
(D) Release of fatty acids during hydrolysis of fats by water in food is one cause of rancidity.

99. Identify the polymer from the following that is obtained by using one of the α-amino acids.

(A) Nylon-6
(B) PHBV
(C) Nylon-2-nylon-6
(D) Bakelite

100. Identify a step growth polymer from following.

(A) Bakelite
(B) Polyethene
(C) Teflon
(D) Polyvinyl chloride

101. The most primitive animal with a central nervous system (CNS) located on the ventral side of body is-------.

(A) *Hydra* (B) *Planaria*
(C) *Sycon* (D) *Scoliodon*

102. Sponges and Coelenterates respire through----------.

(A) Book gills (B) Plasma membrane
(C) Book lungs (D) Cloaca

103. Which one of the following listed organs are mesodermal in origin ?

(A) Muscles, blood, liver, vagina (B) Bones, heart, lens, tongue
(C) Blood, heart, retina, pancreas (D) Muscles, blood, kidneys, gonads

104. The special tissue present in the epiphytic roots for absorption of water vapours from air ----------.

(A) hydathodes (B) lenticels
(C) velamen (D) phloem

105. Which of the following statement is INCORRECT about enzyme substrate complex ?

(A) The substrate induces the enzyme to alter its shape. (B) The substrate is completely bound to the enzyme.
(C) It breaks the chemical bonds of the substrate. (D) The shape of an enzyme changes permanently after the formation of the enzyme-substrate complex.

106. Identify the enzyme that is NOT an isomerase type.

(A) Epimerases (B) Sucrases
(C) Racemases (D) Mutases

107. Identify the INCORRECT statement with respect to enzymatic activity.

(A) Increase in the substrate concentration increases the velocity of enzyme activity. (B) Km value is a constant and a characteristic feature of a given enzyme.
(C) The activity of enzymes is increased at low temperature. (D) The rate of reaction is increased with the increasing concentration of the enzyme.

108. The example of unsaturated fatty acid which is found in many seed oils is

(A) Lecithin (B) Palmitic acid
(C) Stearic acid (D) Linolenic acid

109. Cleavage differs from normal mitotic divisions as

(A) There is no nuclear division during cleavage. (B) There is no division of cytoplasm during cleavage.
(C) There is no growth phase between the cleavages. (D) The division of cytoplasm follows nuclear division.

110. Rate of cuticular transpiration is ---------- to the thickness of cuticle.

(A) Not related (B) Equal
(C) Inversely proportional (D) Directly proportional

111. Given below are two statements related to the apoplast pathway:
Statement (I): When some amount of water passes across the root through the cell wall and the intercellular spaces of cortical cells of root, it is called apoplast pathway.
Statement (II): An additional apoplastic route that allows direct access to the xylem and phloem is along the margins of secondary roots.
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.

112. Which of the following is NOT true with respect to facilitated diffusion ?

(A) It is a passive process.
(B) It is mediated by a carrier protein.
(C) Carrier proteins help move substances across membranes with the expenditure of energy.
(D) Concentration gradient must be present for the molecules to be diffused through facilitated diffusion.

113. Match List I with List II

List I (Reactions)	**List II (Organism which carries this reaction)**
(A). Conversion of soil nitrates into nitrogen gas	(I). *Nitrosomonas*
(B). Conversion of ammonia into nitrite	(II). *Rhizobium*
(C). Conversion of nitrite into nitrate	(III). *Paracoccus*
(D). Conversion of atmospheric nitrogen to ammonia	(IV). *Nitrobacter*

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

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

114. Brown heart disease in plants is caused due to the deficiency of ----------.

(A) Iron
(B) Boron
(C) Zinc
(D) Manganese

115. Which mineral ion is NOT readily remobilized ?

(A) Phosphorus
(B) Sulphur
(C) Calcium
(D) Nitrogen

116. Given below are two statements:
Statement (I): In aerobic respiration, hydrogen removed from respiratory material combines with oxygen to form water.
Statement (II): Removal of hydrogen from respiratory materials is the primary process in respiration.
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.

117. Given below are two statements related to Krebs cycle.
Statement (I): There are four steps of oxidation in Krebs cycle, catalyzed by dehydrogenases using NAD^+ or FAD as the coenzyme.
Statement (II): Two molecules of GTP are produced for every molecule of citric acid oxidized.
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.

118. Which organic acid is produced at the end of the TCA cycle?

(A) Fumaric acid
(B) Oxaloacetic acid
(C) Malic acid
(D) Citric acid

119. During glycolysis, which one of the following intermediates undergoes oxidation as well as phosphorylation?

(A) 3-PGAL
(B) Fructose-1,6-diphosphate
(C) 2-PGA
(D) 3-PGA

120. Substrate level phosphorylation occurs ----------.

(A) in cytoplasm of the cells only.
(B) on the inner mitochondrial membrane.
(C) in matrix of mitochondria only.
(D) in cytoplasm of the cells and matrix of mitochondria.

121. Given below are two statements:
Statement (I): SDP require long uninterrupted dark period for flowering.
Statement (II): If dark period is interrupted even by a flash of light, SDP will flower.
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.

122. Which of the following is NOT the function of cytokinin ?

(A) It promotes cell enlargement besides cell division.
(B) It induces RNA synthesis and formation of interfascicular cambium.
(C) It hastens the senescence and abscission processes in plant organs.
(D) It promotes the growth of lateral buds and controls apical dominance by cell division.

123. If a leaf is 50 cm^2 in size and the growth rate per day is 5 cm^2 , then its relative growth rate would become ----------.

(A) 50 %
(B) 100 %
(C) 20 %
(D) 10 %

124. The natural auxin produced by the placental tissue of the unfertilized ovary and responsible for enlargement of ovary into fruit is ----------.

(A) NAA
(B) 2,4-D
(C) IAA
(D) IBA

125. Given below are two statements:
Statement (I): Enzyme enterokinase is present in pancreatic juice.
Statement (II): Enterokinase helps in the conversion of inactive trypsinogen into active trypsin.
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.

126. A six months old child shows impairment in physical growth, retardation in mental development, prominent ribs and thin limbs. He is probably suffering from ----------.

(A) Kwashiorkor
(B) Marasmus
(C) Jaundice
(D) Constipation

127. Mineral ion like sodium is absorbed in the intestine mainly by ----------.

(A) Osmosis
(B) Active transport
(C) Simple diffusion
(D) Passive transport

128. Which of the following is NOT true with respect to liver ?

(A) Bile is collected and carried through bile duct and stored in sac like gall bladder.
(B) Bile juice secreted by liver emulsifies fats and makes food alkaline.
(C) Liver acts as a haemopoietic organ in adult human beings.
(D) Kupffer cells destroy toxic substances, dead and worn-out blood cells and microorganisms.

129. Which of the following guards the opening of oesophagus into the stomach ?

(A) Cardiac sphincter
(B) Pyloric sphincter
(C) Sphincter of Oddi
(D) Ileocaecal valve

130. Which of the following does NOT occur during inspiration ?

(A) Ribs and sternum move upward and outward.
(B) Diaphragm becomes flat.
(C) Increase in pressure of thorax and the lungs.
(D) The external intercostal muscles contract.

131. Arrange the following in order of increasing volume
(P) Residual volume
(Q) Tidal volume
(R) Inspiratory reserve volume
(S) Expiratory reserve volume

(A) $R < S < P < Q$.
(B) $Q < S < P < R$.
(C) $P < Q < R < S$.
(D) $S < R < Q < P$.

132. Arrange the following organs of the Human respiratory system from outside to inside:

(A) Lungs, pleural membranes, thoracic cavity, alveoli
(B) Thoracic cavity, lungs, pleural membranes, alveoli
(C) Thoracic cavity, pleural membranes, lungs, alveoli
(D) Thoracic cavity, lungs, alveoli, pleural membranes

133. Match List I with List II

List I (Heart valves.)	**List II (Location.)**
(A). Semilunar valves	(I). Opening of coronary sinus
(B). Thebesian valves	(II). In the left AV aperture
(C). Eustachian valve	(III). Opening of pulmonary aorta and Aorta
(D). Mitral valve	(IV). Opening of inferior vena cava

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

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

134. Calculate the heart rate per minute if the stroke volume is 70 ml and cardiac output of heart is 5250 ml/min.

(A) 85
(B) 72
(C) 75
(D) 80

135. Which one of the following statements is INCORRECT with respect to thrombocytes ?

(A) Thrombocytes are cellular fragments formed from the large cells called megakaryocytes.
(B) These are produced in bone marrow.
(C) These are very small, nucleated, biconcave cells.
(D) The normal count of thrombocytes in human blood is about 2.5 - 4.5 lakh/mm^3 of blood.

136. A person underwent surgery that leads to tremendous blood loss. He was detected with anemia due to ------.

(A) Leucocytosis
(B) Erythrocytopenia
(C) Polycythemia
(D) Leukemia

137. Presence of which of the following conditions in urine are indicative of diabetes mellitus ?

(A) Uremia and Nephritis
(B) Uremia and Renal Calculi
(C) Ketonuria and Glycosuria
(D) Ketonuria and Uremia

138. Acute renal failure can be detected biochemically by ----------.

(A) Elevated level of amino acids.
(B) Lower level of uric acid.
(C) Elevated level of serum creatinine.
(D) Lower level of serum creatinine.

139. Select the INCORRECT statement related to tubular secretion.

(A) Tubular secretion is the only mode of excretion in marine bony fishes and desert amphibians.
(B) Tubular secretion helps in changing the pH of urine from acidic to alkaline.
(C) During tubular secretion, cells of distal convoluted tubule actively absorb creatinine, K^+, H^+, etc. from peritubular capillaries.
(D) During tubular secretion, cells of distal convoluted tubule secrete creatinine, K^+, H^+ etc. from peritubular capillaries into lumen of DCT and CT.

140. Atrial natriuretic peptide performs all the following functions except ----------.

(A) Inhibits Na^+ and Cl^- absorption from collecting ducts.
(B) Decreases excretion of Na^+ in urine.
(C) Inhibits release of renin.
(D) Reduces aldosterone and ADH release.

141. Given below are two statements:
Statement (I): Cortical nephrons have shorter loop of Henle which extend very little in medulla.
Statement (II): Juxtamedullary nephrons have longer loop of Henle that runs deep into medulla.
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.

142. Nitrogenous waste which is less toxic, soluble in water and formed during ornithine cycle is ----------.

(A) Urea
(B) Uric acid
(C) Ammonia
(D) Amino acid

143. Which one of the following is NOT included in the group of exteroceptors ?

(A) Photoreceptors
(B) Baroreceptors
(C) Chemoreceptors
(D) Statoreceptors

144. The parasympathetic nervous system has an inhibitory effect on most organs. However, certain activities which are inhibited by the sympathetic system are accelerated by the parasympathetic system. Which of the following set of activities is accelerated by the parasympathetic system?

(A) Constriction of pupil, Peristalsis and Micturition.
(B) Heart rate, Arterial Blood pressure, Micturition.
(C) Peristalsis, Arterial Blood pressure, Constriction of pupil.
(D) Heart rate, Peristalsis and Micturition.

145. Which of the following statement is INCORRECT ?

(A) Superior colliculi are involved in visual reflexes.
(B) Inferior colliculi are relay centers for auditory reflexes.
(C) The corpora quadrigemina are four rounded elevations on the ventral surface of the mid brain.
(D) Superior colliculi and inferior colliculi together form corpora quadrigemina.

146. During transmission of a nerve impulse, the action potential results from the movement of----------.

(A) K^+ ions from extracellular fluid to intracellular fluid.
(B) Na^+ ions from intracellular fluid to extracellular fluid.
(C) K^+ ions from intracellular fluid to extracellular fluid.
(D) Na^+ ions from extracellular fluid to intracellular fluid.

147. Which of the following chemical substance destroys the neurotransmitter once the impulse has been transferred across the synapse ?

(A) Catecholamine
(B) Adrenaline
(C) Acetyl choline
(D) Cholinesterase

148. Which is the correct sequence of hormone action through membrane receptors?
I. Physiological responses e.g. ovarian growth.
II. Generation of secondary messenger.
III. Release of an enzyme adenylate cyclase from the receptor site.
IV. Formation of hormone receptor complex e.g. FSH.
V. Biochemical responses

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

149. Which pair of hormones is secreted by the hypothalamus?

(A) TSH and ACTH
(B) GnRH and Somatotropin
(C) ADH and Oxytocin
(D) Corticotropin and Somatotropin

150. Which of the following organs secretes the hormone relaxin in the later phase of pregnancy?

(A) Uterus
(B) Ovary
(C) Fetus
(D) Fallopian tube

151. The most common method of asexual reproduction in unicellular Yeast is ----------.

(A) Fragmentation
(B) Budding
(C) Binary fission
(D) Conidia formation

152. In adventive polyembryony, an embryo develops directly from the diploid cell of ----------.

(A) zygote and nucellus
(B) nucellus and integuments
(C) integuments and zygote
(D) megaspore mother cell and nucellus

153. The outbreeding device where anthers and stigmas mature at different times is called as ----------.

(A) Unisexuality
(B) Dichogamy
(C) Herkogamy
(D) Heteromorphy

154. The outer thick layer of microspore is made up of ----------.

(A) cellulose
(B) pectin
(C) sporopollenin
(D) hemicellulose

155. How many spermatozoa and ova will be formed by 50 primary spermatocytes and 50 primary oocytes, respectively?

(A) 200 and 50
(B) 50 and 200
(C) 100 and 400
(D) 200 and 100

156. Which layer in the Graafian follicle produces the hormone estrogen?

(A) membrana granulosa
(B) Theca externa
(C) Theca interna
(D) Cumulus oophorus

157. Match List I with List II

List I (Contraceptive aids.)	**List II (Mode of action.)**
(A). Lippes loop	(I). Make the uterus unsuitable for implantation and cervix hostile to the sperms.
(B). Cu-T	(II). Attracts the macrophages which increase phagocytosis of sperms.
(C). LNG-20	(III). Blocks the entry of sperms through the cervix.
(D). Vaults	(IV). Suppress sperm mobility and fertilizing capacity of sperms.

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

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

158. Which one of the following is NOT a symptom of Turner's syndrome ?

(A) Broad shield-shaped chest
(B) Webbed neck
(C) Gynaecomastia
(D) Lower posterior hair line

159. The daughter of a colour- blind father and a normal mother marries a normal male. What percentage of male children of this couple will be colour -blind ?

(A) 50 %
(B) 25 %
(C) 75 %
(D) 0 %

160. In a monohybrid cross between pure tall pea plant with pure dwarf pea plant, how many types of genotypes are found in the F_2 generation ?

(A) 4 (B) 3
(C) 8 (D) 9

161. Linkage of genes in plants was discovered by ----------.

(A) T. H. Morgan (B) Bateson and Punnett
(C) Sutton and Boveri (D) W. Waldeyer

162. Which one of the following is NOT an example of complete sex linkage ?

(A) Red-green color blindness (B) Myopia
(C) Nephritis (D) Haemophilia

163. Which one of the following is NOT the main aim of Human Genome Project ?

(A) Mapping the entire human genome at the level of nucleotide sequences. (B) To store the information collected from the project in databases.
(C) To prevent the transfer of related technologies to the private sectors, such as industries. (D) To develop tools and techniques for analysis of data.

164. Given below are two statements:
Statement (I): DNA fingerprinting technique involves identifying similarities in VNTRs.
Statement (II): The length of the regions having VNTRs is different in each individual.
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.

165. Match List I with List II

List I (Enzymes involved in DNA replication)	**List II (Function.)**
(A) Helicase	(I) Forms double helix to form daughter DNA molecules.
(B) DNA polymerase	(II) Activation of nucleotides.
(C) DNA gyrase	(III) Unwinding of DNA.
(D) Phosphorylase	(IV) Removal of RNA primers.

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

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

166. The enzyme that facilitates local unwinding of DNA duplex during transcription is----------.

(A) DNA helicase (B) DNA polymerase
(C) RNA polymerase (D) DNA ligase

167. Hershey-Chase performed an experiment on----------.

(A) *Escherichia coli* (B) *Streptococcus pneumoniae*
(C) Bacteriophages (D) *Salmonella typhi*

168. In a DNA strand, the nucleotides are linked together by----------.

(A) Glycosidic bond (B) Phosphodiester bond
(C) Peptide bond (D) Hydrogen bond

169. Which one of the following statements is CORRECT ?

(A) Homologous organs indicate both convergent and divergent evolution. (B) Analogous organs indicate both convergent and divergent evolution.
(C) Homologous organs lead to divergent evolution while analogous organs lead to convergent evolution. (D) Analogous organs lead to divergent evolution while homologous organs lead to convergent evolution.

170. The highest cranial capacity among the following is found in ----------.

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

171. Given below are two statements:
Statement (I): Lamarck's theory of inheritance of acquired characters was disproved by Weismann.
Statement (II): According to Weismann, variations produced in somatic cells are inherited while variations produced in germ cells are not inherited to the next generation.
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.

172. Darwin's finches is the classic example of ----------.

(A) Habitat isolation
(B) Seasonal isolation
(C) Geographical isolation
(D) Ethological isolation

173. Which of the following was the most active element in the primitive atmosphere on earth ?

(A) Nitrogen
(B) Carbon
(C) Sulphur
(D) Hydrogen

174. Identify the groups of cannabinoids.

(A) Heroin, Di-acetyl morphine, Ganja
(B) Cocain, Heroin, LSD
(C) Marijuana, Hashish, Charas
(D) Morphine, Heroin, Hashish

175. Which of the following is a pair of viral diseases ?

(A) Malaria and AIDS
(B) Filariasis and AIDS
(C) Common Cold and Dengue.
(D) Typhoid and Common Cold

176. *Wuchereria bancrofti* is transmitted to human body by ----------.

(A) female *Anopheles* mosquito
(B) female *Aedes* mosquito
(C) female *Culex* mosquito
(D) *Plasmodium ovale*

177. A person who has recovered from attack of measles develops ---------- immunity to measles, for the life time.

(A) natural acquired active
(B) artificial acquired active
(C) natural acquired passive
(D) artificial acquired passive

178. All the following are the major categories of psychological disorders except ____.

(A) Autism spectrum disorder.
(B) Attention Deficit Hyperactivity Disorder.
(C) Alzheimer's disease.
(D) Intellectual disability.

179. Which of the following is considered as the best layer (for eggs) variety ?

(A) Plymouth Rock
(B) Rhode Island Red
(C) Leghorn
(D) Aseel

180. Match List I with List II

List I (Fortified crops.)	**List II (Enriched in.)**
(A). Maize	(I). Vitamin A and minerals
(B). Wheat	(II). Lysine and tryptophan
(C). Spinach	(III). Vitamin C
(D). Tomato	(IV). High protein

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

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

181. The name of a high-yielding and water-stress resistant variety of Bajra developed in India is ----------.

(A) Ganga-3
(B) Niphad
(C) CO-12
(D) Sonalika

182. At which stage, the embryos are implanted in the uterus of surrogate mothers in MOET technology?

(A) Just fertilized eggs
(B) Gastrula
(C) 8 to 32 celled embryos
(D) Blastula

183. Which of the following bioherbicide can be used if a lake is abundantly covered by water hyacinth plants ?

(A) *Phytophthora palmivora*
(B) *Alternaria crassa*
(C) *Fusarium spp.*
(D) *Agrobacterium spp.*

184. Given below are two statements:
Statement (I): In rDNA technology, the transformation process generates a mixed population of transformed and non-transformed host cells.
Statement (II): In the screening process, both transformed and non-transformed host cells divide and redivide along with the replication of recombinant DNA.
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.

185. Which GMO crop plant is having an adverse effect on Monarch butterfly populations?

(A) Bt brinjal
(B) Bt cotton
(C) Bt corn
(D) Bt tobacco

186. Match List I with List II

List I (Disorder/Health condition.)	**List II (Recombinant protein.)**
(A). Emphysema	(I). Platelet derived growth factor
(B). Blood clots	(II). Alpha 1 Antitrypsin
(C). Atherosclerosis	(III). Erythropoietin
(D). Anaemia	(IV). Urokinase

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

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

187. Which vaccine is produced by ' melt in the mouth' concept ?

(A) Smallpox vaccine
(B) Hepatitis vaccine
(C) Flu vaccine by *Bacillus*
(D) Cervical cancer vaccine

188. The Ti plasmid used in genetic engineering in plants is obtained from ----------.

(A) *Bacillus thuringiensis*
(B) *Escherichia coli*
(C) *Agrobacterium tumefaciens*
(D) *Salmonella typhi*

189. Select the INCORRECT match.

(A) Humming birds and plants : Co-evolution
(B) Lice on humans : Parasitism
(C) Sea anemone and clown fish : Mutualism
(D) Flamingos and resident fish on the west coast of Mumbai : Competition

190. Which out of the four basic processes that act on the population growth contribute to an increase in population density ?

(A) Natality and Mortality
(B) Natality and Emigration
(C) Mortality and Immigration
(D) Natality and Immigration

191. What kind of adaptation is shown by desert lizards to survive in their habitats ?

(A) Morphological
(B) Physiological
(C) Biochemical
(D) Behavioural

192. The position of an organism in the environmental gradient is called ----------.

(A) Spatial niche
(B) Multidimensional niche
(C) Trophic niche
(D) Habitat niche

193. Which of the following is considered as the main ecological service?

(A) Waste decomposition and detoxification
(B) Fixation of atmospheric CO_2 and release of O_2
(C) Purification of water and air
(D) Genetic resources including crop improvement

194. Secondary succession takes place on/in ----------

(A) newly cooled lava
(B) bare rock
(C) abandoned farm land
(D) newly created pond

195. In a food chain of Grass - Deer - Leopard, if 1000 Joules of energy is available at the producer level, then how much energy will be received by leopard ?

(A) 1000 Joules
(B) 100 Joules
(C) 10 Joules
(D) 1 Joules

196. The available biomass for the consumption, to heterotrophs is ----------.

(A) Gross primary productivity
(B) Net primary productivity
(C) Secondary productivity
(D) Net secondary productivity

197. Select the INCORRECT statement related to Biological Diversity Act.

(A) The government passed Biological Diversity Act in the year 2002 in compliance with CBD.
(B) It broadly defines biodiversity, as plants, animals and microorganisms and their parts, their genetic materials and by-products.
(C) It includes value added products and human genetic material.
(D) Scientific cataloguing of traditional knowledge about ethnobiological materials is a part of Biodiversity Act.

198. The primary cause of loss of biodiversity is ----------.

(A) Habitat loss and fragmentation
(B) Overexploitation
(C) Alien species invasion
(D) Co-extinctions

199. The Montreal Protocol was signed at Montreal in 1987 to control ----------.

(A) Biodiversity loss
(B) Water pollution
(C) Emission of ozone depleting substances
(D) CO_2 emission

200. Which equipment is most widely used for removing particulate matter present in industrial exhaust ?

(A) Electrostatic precipitator
(B) Scrubber
(C) Filters
(D) Catalytic converters

- End of Question Paper -