MHT CET 2026 PCB Apr 21 Shift 2 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. Out of the following vectors, identify the one which is normal to the force, $\vec{F} = 4\hat{i} - 3\hat{j}$.

(A) $-6\hat{i}$ (B) $7\hat{i}$

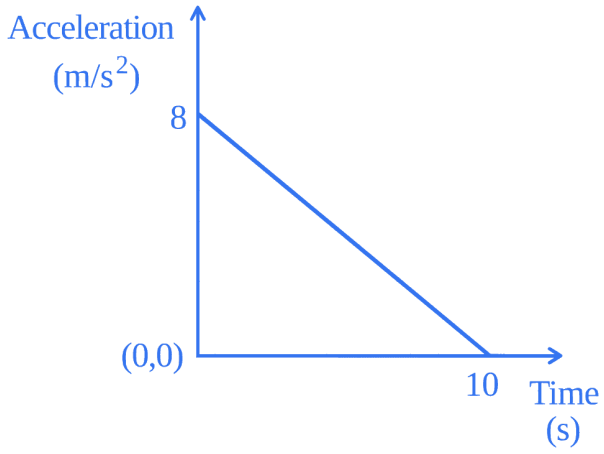
(C) $3\hat{i} + 4\hat{j}$ (D) $4\hat{i} + 3\hat{j}$

2. If the errors involved in the measurement of a side and the mass of a cube are 2% and 4% respectively, the maximum permissible error in the density of the material is

(A) 2% (B) 6%

(C) 10% (D) 12%

3. The acceleration (a) -time (t) graph for the body starting from rest is as shown in the figure. The maximum speed of the body is



(A) 200 m/s (B) 160 m/s

(C) 80 m/s (D) 40 m/s

4. A stone of mass 100 g, attached at the end of a 1 m long string is whirled in a horizontal circle. If the string makes an angle 'θ' with the vertical, then the value of centripetal force acting on the stone is (Take $g = 10$ m/s^2)

(A) $0.1(\tan\theta)$ (B) $\tan\theta$

(C) $10(\tan\theta)$ (D) $100(\tan\theta)$

5. When a bob of mass m moves in a horizontal circle of radius r, with uniform velocity having the length of string L, describes a cone of semi-vertical angle θ. The centripetal force acting on the bob is given by (g = gravitational acceleration)

(A) $mgr/(L^2 - r^2)$ (B) $mgr/(L^2 - r^2)^{1/2}$

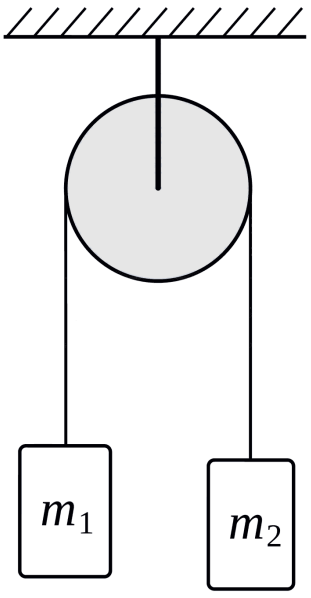
(C) $(L^2 - r^2)^{1/2}/mgL$ (D) $mgL/(L^2 - r^2)^{1/2}$

6. Two particles A and B move in concentric circles of radii r_1 and r_2 respectively in such a way that position of particles A, B and the centre of the circle (O) always lie on a straight line, the ratio of their angular velocities ($\omega_1 : \omega_2$) is

(A) $r_1 : r_2$ (B) $r_2 : r_1$

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

7. Two masses 'm_1' and 'm_2' ($m_1 > m_2$) tied to a massless, inextensible string are hanging over a light frictionless pulley as shown. When the system is free to move, the acceleration of the masses is $g/4$. The masses 'm_1' and 'm_2' are related as [g = acceleration due to gravity]



(A) $5m_1 = 4m_2$ (B) $5m_1 = 3m_2$

(C) $4m_1 = 5m_2$ (D) $3m_1 = 5m_2$

8. When a long spring is stretched by 1 cm, the potential energy stored in the spring is U_1. If it is stretched by 4 cm, the potential energy stored in it is U_2. The difference between the energy is

(A) $9U_1$ (B) $10U_1$

(C) $15U_1$ (D) $16U_1$

9. Let 'R' be the radius of the earth. The height 'h ' from the surface of the earth where the value of acceleration due to gravity will be half its value on the surface of the earth, is

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

(C) $2R$ (D) R

10. Two capillary tubes of the same diameter are kept vertically in two different liquids whose density are in the ratio 4 : 3. Rise of liquid in both the capillaries is h_1 and h_2 respectively. Their surface tensions are in the ratio 6 : 5, the ratio of the heights $\left(\frac{h_1}{h_2}\right)$ is (Assume that their angles of contact are same)

(A) 0.4 (B) 0.5

(C) 0.8 (D) 0.9

11. A certain number of spherical liquid drops of radius r coalesce to form a single drop of radius R and volume V. If T is the surface tension of the liquid which one of the following statement is true for the energy (E) in the process?

(A) $E = 3VT\left[\frac{1}{r}-\frac{1}{R}\right]$ is released (B) $E = 4VT\left[\frac{1}{r}-\frac{1}{R}\right]$ is released

(C) $E = 3VT\left[\frac{1}{r}-\frac{1}{R}\right]$ is absorbed (D) $E = 4VT\left[\frac{1}{r}-\frac{1}{R}\right]$ is absorbed

12. A small ball of mass M, radius R and density ρ moves with terminal velocity V through a container filled with glycerin. If the density of glycerin is σ, the viscous force acting on the ball is (g = gravitational acceleration)

(A) $Mg(\rho-\sigma)$ (B) $Mg\left(1-\frac{\sigma}{\rho}\right)$

(C) $Mg\rho\sigma$ (D) $Mg\left(\frac{\rho}{\sigma}\right)$

13. On a new linear scale of temperature (called W scale) the freezing and boiling points of water are 35°W and 235°W respectively. The temperature on the new scale, corresponding to 70°C temperature on celsius scale, will be

(A) 210°W (B) 175°W

(C) 105°W (D) 70°W

14. The rate of dissipation of the heat by a black body at temperature T is Q. The rate of dissipation of heat by ordinary body of the same area at temperature $3T$ and having emissivity 0.25, will be nearly

(A) 20 Q (B) 15 Q

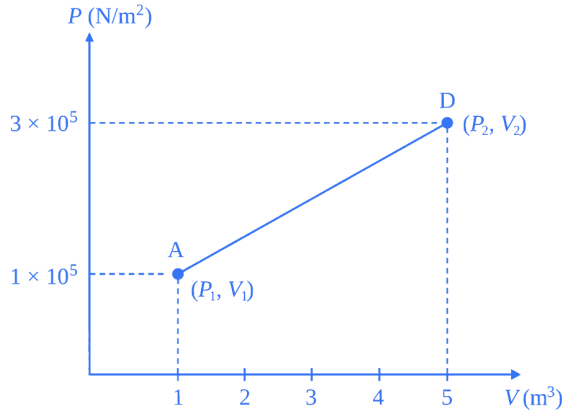
(C) 10 Q (D) $6Q$

15. A monoatomic gas is compressed to (1/8) th of its volume adiabatically. If its initial pressure is P_0, then increase in the pressure will be

(A) 32 P_0 (B) 31 P_0

(C) 16 P_0 (D) 15 P_0

16. Thermodynamic change in the system from state (P_1, V_1) to (P_2, V_2) is shown in the figure. The work done by the system is



(A) 16×10^5 J (B) 12×10^5 J

(C) 8×10^5 J (D) 4×10^5 J

17. If a non-linear polyatomic gas has f vibrational modes, the value of $\gamma = C_p/C_v$ is (C_p and C_v are specific heats at constant pressure and volume respectively)

(A) $\frac{4+f}{2+f}$ (B) $\frac{3+f}{4-f}$

(C) $\frac{f-4}{3+f}$ (D) $\frac{4+f}{3+f}$

18. For a rigid diatomic molecule, universal gas constant $R = nC_p$ where 'C_p' is the molar specific heat at constant pressure. The value of fractional number 'n' is

(A) 4/9 (B) 2/7

(C) 3/8 (D) 5/6

19. If the kinetic energy of simple pendulum is $\frac{1}{4}$ of its total energy, then the displacement (x) and amplitude (A) are related as

(A) $x = A$ (B) $x = 2A$

(C) $x = \frac{\sqrt{3}}{2}A$ (D) $x = \frac{\sqrt{3}}{4}A$

20. A particle starts oscillating simple harmonically from its mean position with time period 'T'. At time $t = \frac{T}{12}$, the ratio of the potential energy to kinetic energy of the particle is $[\sin 30^\circ = \cos 60^\circ = 0.5,\ \cos 30^\circ = \sin 60^\circ = \frac{\sqrt{3}}{2}]$

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

(C) 2 : 1 (D) 3 : 1

21. In a pipe closed at one end, air column is vibrating in its third overtone. The air column has

(A) three nodes and three antinodes (B) three nodes and four antinodes

(C) four nodes and three antinodes (D) four nodes and four antinodes

22. An organ pipe P_1 closed at one end has vibrating air column in its first overtone and another pipe P_2 open at both ends has vibrating air column in the third overtone, are in resonance with a given tuning fork. The ratio of the length of pipe P_1 to that of P_2 is

(A) 1 : 8 (B) 3 : 8

(C) 5 : 8 (D) 1 : 2

23. A string fixed at both the ends, forms a standing wave with node separation of 5 cm. If the velocity of the wave on the string is 2 m/s, then the frequency of vibration of the string is

(A) 40 Hz (B) 20 Hz

(C) 10 Hz (D) 0.2 Hz

24. Which one of the following statements is true?

(A) Both light and sound waves in air are longitudinal. (B) Both light and sound waves in air are transverse.

(C) Both light and sound waves can travel through vacuum. (D) The sound waves in air are longitudinal while the light waves in air are transverse.

25. A particle of mass 'M' and charge 'q' initially at rest is accelerated by a uniform electric field 'E' through a distance 'D' and is then allowed to approach a fixed static charge 'Q' of the same sign. The distance of the closest approach of the charge q is [ϵ_0 = permittivity of free space]

(A) $Qq/4\pi\epsilon_0 D$ (B) $Q/4\pi\epsilon_0 ED$

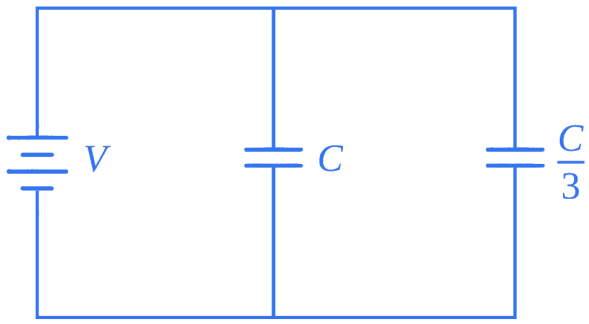
(C) $qQ/2\pi\epsilon_0 D^2$ (D) $Q/4\pi\epsilon_0 E$

26. Four point charges $-Q$, $-q$, $2q$ and $3Q$ are placed at corners of the square respectively. The relation between Q and q for which the potential at the centre of the square is zero, is

(A) $Q = q$ (B) $Q = -q/2$

(C) $Q = -1/q$ (D) $Q = 1/2q$

27. Two capacitors of capacity C and $C/3$ are connected to a battery of voltage V as shown. The work done in charging both the capacitors fully is



(A) $CV^2/3$ (B) $4CV^2/3$

(C) $2CV^2/3$ (D) $3CV^2$

28. A series combination of 10 capacitors, each of value 'C_1' is charged by a source of potential difference '$4V$'. When another parallel combination of 8 capacitors, each of value 'C_2' is charged by a source of potential difference 'V'. The relation between C_1 and C_2, so that the energies in the two combinations will be same is

(A) $C_2 = 64C_1/5$ (B) $C_2 = 1.6C_1$

(C) $C_2 = C_1/5$ (D) $C_2 = C_1/40$

29. Let 'A' be the cross-sectional area and 'ρ' be the specific resistance of a potentiometer wire. If 'I' is the current passing through the wire, then the potential gradient along the length of the wire is

(A) $\frac{IA}{\rho}$ (B) $IA\rho$

(C) $\frac{I\rho}{A}$ (D) $\frac{I}{\rho A}$

30. An ammeter of resistance R give a full scale deflection when a current of 3 A passes through it. If it is to measure maximum current of 10 A, the shunt required is

(A) $3R/5$ (B) $2R/5$

(C) $3R/7$ (D) $4R/7$

31. A circular coil having 'n' turns, each of radius 'r' carries a current 'I'. The magnetic field at a distance $x = \sqrt{3}r$ from its center, along the axis of the coil, is [μ_0 = permeability of free space]

(A) $\frac{\mu_0 nI}{4r}$ (B) $\frac{\mu_0 nI}{8r}$

(C) $\frac{\mu_0 nI}{16r}$ (D) $\frac{\mu_0 nI}{32r}$

32. Two identical long parallel wires carry current 'I_1' and 'I_2' such that $I_1 > I_2$. When the currents are in the same direction, the magnetic field at a point midway between the wires is 6×10^{-6} T. If the direction of 'I_2' is reversed, the field becomes 3×10^{-5} T. The ratio $\left(\frac{I_1}{I_2}\right)$ is

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

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

33. The magnetic flux through a coil of resistance R changes by an amount $\Delta\Phi$ in the time Δt . The total quantity of electric charge (Q) induced is

(A) $Q = -\frac{\Delta\Phi}{\Delta t} + R$ (B) $Q = \frac{\Delta\Phi}{\Delta t} \times R$

(C) $Q = \frac{\Delta\Phi}{R}$ (D) $Q = \frac{\Delta\Phi}{\Delta t}$

34. If 'N' is the number of turns in a circular coil, the value of its self-inductance varies as

(A) N^{-2} (B) N^{-1}

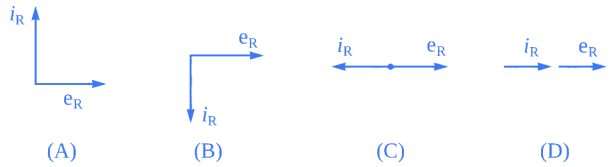
(C) N^{1} (D) N^{2}

35. Two coils P and S have a mutual inductance of 5×10^{-3} H. If the current in the primary (P) is $I = 10\sin(100\pi t)$, then the maximum value of e.m.f. induced in S is (in volt)

(A) π (B) 2π

(C) 3π (D) 5π

36. When a.c. source is connected across a resistance, the correct phasor relation between the current (i_R) and emf (e_R) is shown in figure



(A) (B) (B) (D)

(C) (A) (D) (C)

37. A series L-C-R circuit is connected to a source of alternating emf of 50 V. The potential difference across inductor and capacitor is 80 V and 50 V respectively. The potential difference across the resistor is

(A) 80 V (B) 70 V

(C) 50 V (D) 40 V

38. In series LCR circuit, $R = 10\,\Omega$ and impedance is 30 Ω. An rms voltage 210 V is applied across the circuit. The true power consumed in A.C. circuit in watt is

(A) 49 (B) 220

(C) 490 (D) 1470

39. A ray of light travels from a denser medium to a rarer medium. The reflected and the refracted rays are perpendicular to each other. If r and r' are angles of reflection and refraction respectively, then the angle of incidence i is equal to [C = critical angle]

(A) $\sin^{-1}(\tan C)$ (B) $\tan^{-1}(\sin r)$

(C) $\tan^{-1}(\sin C)$ (D) $\sin^{-1}(\tan r')$

40. In a single slit diffraction pattern, identify the **incorrect** statement from the following

(A) The fringes have unequal width. (B) The fringes have unequal intensity.

(C) The fringes have unequal width and unequal intensity. (D) The fringes have equal width and equal intensity.

41. In Young's double slit experiment, the intensity on screen at a point, where path difference is '$\lambda/4$', is '$K/4$'. The intensity at a point when path difference is 'λ' will be $[\cos(\pi/4) = 1/\sqrt{2},\ \cos(\pi/2) = 0,\ \cos(2\pi) = 1]$

(A) $4K$ (B) $2K$

(C) $7K$ (D) $K/2$

42. In Young's double slit experiment, in an interference pattern, third minimum is observed exactly in front of one of the slits. If 'd' is the distance between the slits and 'D' is the distance between the slits and the screen, the wavelength of light used is

(A) $d^2/3D$ (B) $d^2/4D$

(C) $d^2/5D$ (D) $d^2/6D$

43. When light of wavelength 'λ' is incident on a photosensitive surface, the stopping potential is 'V'. When light of wavelength '2λ' is incident on the same surface, the stopping potential is $V/3$. Threshold wavelength for the surface is

(A) 2λ (B) 3λ

(C) 4λ (D) 6λ

44. An electron of mass 'm' accelerated through a potential difference 'V' has the de Broglie wavelength associated with it as 'λ'. If a proton of a mass 'M' is accelerated through the same potential difference 'V', the de Broglie wavelength associated with it will be

(A) $\left(\sqrt{\frac{m}{M}}\right)\lambda$ (B) $\left(\sqrt{\frac{M}{m}}\right)\lambda$

(C) $\frac{\lambda M}{m}$ (D) $\frac{M}{\lambda m}$

45. In hydrogen spectrum the ratio of wavelengths of the last line of Lyman series and the last line of Balmer series is

(A) 1 (B) 0.5

(C) 0.25 (D) 0.2

46. An electron of mass 'm_e' and charge 'e' revolving around the nucleus in n^{th} orbit has orbital magnetic moment $\frac{enh}{4\pi m_e}$ which is equal to Bohr Magneton, the orbit number in which electron should revolve is (h = Planck's constant)

(A) four (B) three

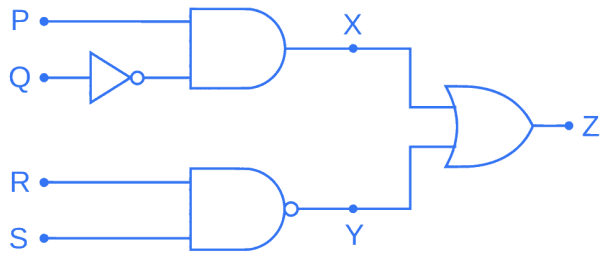
(C) two (D) one

47. Two radioactive materials A and B having decay constant '7λ' and 'λ' respectively, initially have same number of nuclei. The time taken to have the ratio of number of nuclei of material B to that of A as 'e', is

(A) $1/\lambda$ (B) $1/6\lambda$

(C) $1/7\lambda$ (D) $1/8\lambda$

48. A combination of logic gates is as shown in the figure. P, Q, R and S are the inputs and X, Y and Z are outputs. When inputs P and R are "low" and Q and S are "high", the outputs X, Y and Z respectively are



(A) $1, 0, 0$ (B) $1, 1, 1$

(C) $0, 1, 0$ (D) $0, 1, 1$

49. In semiconductors, at room temperature

(A) the valence band is completely empty. (B) the conduction band is completely empty.

(C) The valence band is partially empty and the conduction band is partially filled. (D) the valence band is completely filled and the conduction band is partially filled.

50. The output characteristics of a transistor in CE mode is the graph obtained by plotting

(A) I_C against I_B at constant V_{BE} (B) I_C against V_{EB} at constant V_{CE}

(C) I_C against I_B at constant V_{CE} (D) I_C against V_{CE} at constant I_B

51. What is the gram atomic mass of an element whose mass of one atom is 3.9853×10^{-23} g?

(A) 23 g
(B) 24 g
(C) 27 g
(D) 16 g

52. Calculate the wavelength, wavenumber of photon having its energy 8.0×10^{-19} J.
$[h = 6.626 \times 10^{-34}\ \text{J s},\ C = 3.0 \times 10^{8}\ \text{m s}^{-1}]$

(A) $\lambda = 2.485 \times 10^{-7}$ m and $\bar{\nu} = 4.024 \times 10^{6}\ \text{m}^{-1}$.
(B) $\lambda = 4.810 \times 10^{-7}$ m and $\bar{\nu} = 8.048 \times 10^{6}\ \text{m}^{-1}$.
(C) $\lambda = 7.217 \times 10^{-7}$ m and $\bar{\nu} = 7.912 \times 10^{6}\ \text{m}^{-1}$.
(D) $\lambda = 9.616 \times 10^{-7}$ m and $\bar{\nu} = 2.012 \times 10^{6}\ \text{m}^{-1}$.

53. Identify a hydride with highest boiling point from following?

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

54. Identify the hybridization in BF_3 molecule.

(A) sp hybridization
(B) sp^2 hybridization
(C) sp^3 hybridization
(D) sp^3d hybridization

55. Find the number of molecules in 0.25 m^3 of the gas at a pressure 2.0×10^2 kPa and a temperature 300 K. $[R = 8.314\ \text{J K}^{-1}\text{mol}^{-1}]$

(A) 1.2044×10^{25}
(B) 2.4088×10^{25}
(C) 3.6077×10^{25}
(D) 4.8099×10^{25}

56. The 'x' moles gas is allowed to expand isothermally and reversibly from 10 dm^3 to 20 dm^3 at 300 K and -17290 J work is obtained. Find the value of 'x'.
$[2.303 \times R = 19.15\ \text{J K}^{-1}\text{mol}^{-1}]$

(A) 4
(B) 6
(C) 8
(D) 10

57. Enthalpy of combustion of carbon to carbon dioxide is -390 kJ/mol. What is the amount of heat released when 35 g of carbon dioxide is formed from the reaction of carbon and dioxygen gas?

(A) 245 kJ
(B) 310 kJ
(C) 490 kJ
(D) 700 kJ

58. In which of the following changes, entropy of the system decreases?

(A) Dissolution of solid I_2 in water
(B) Dissociation of H_2 molecule into atoms
(C) Formation of liquid water from hydrogen and oxygen gas molecules
(D) Ice melts at 0°C

59. A gas is compressed by an average pressure of 0.50 atmosphere, so as to decrease its volume from 400 cm^3 to 200 cm^3. What will be the work done in this case?

(A) 10.13 J
(B) 20.13 J
(C) 30.13 J
(D) 40.13 J

60. Calculate the pH of the resulting solution obtained by mixing 60 mL 0.1 M HCl and 40 mL 0.1 M NaOH.

(A) 2.301
(B) 1.699
(C) 2.699
(D) 3.301

61. If K_a of weak acid HA is 1×10^{-7}, calculate the $[H_3O^+]$ of 0.1 M solution at equilibrium.

(A) 1×10^{-3} M
(B) 1×10^{-5} M
(C) 1×10^{-4} M
(D) 1×10^{-2} M

62. Dissociation constant values for H_2CO_3, CH_3COOH, HCN, and HF are 4.3×10^{-7}, 1.8×10^{-5}, 4.0×10^{-10} and 7.2×10^{-4} respectively, at 25°C. Identify the correct order of their increasing acid strength.

(A) HF < CH_3COOH < H_2CO_3 < HCN
(B) HCN < H_2CO_3 < CH_3COOH < HF
(C) HCN < HF < H_2CO_3 < CH_3COOH
(D) CH_3COOH < H_2CO_3 < HF < HCN

63. Find the average oxidation number of sulphur in tetrathionate ion.

(A) +2
(B) +3
(C) −2
(D) +2.5

64. Which of the following mixtures is water gas?

(A) $CO_{2(g)} + H_{2(g)}$
(B) $CO_{(g)} + H_{2(g)}$
(C) $CO_{2(g)} + N_{2(g)}$
(D) $SO_{2(g)} + N_{2(g)}$

65. The IUPAC name of Neo-pentyl chloride is _____

(A) 2-chloro 2-methyl propane
(B) 1-chloro-2, 2-dimethyl propane
(C) 1-chloropropane
(D) 1-chloro 2-methyl propane

66. Identify the correct order of the priority of the following functional group.

(A) $-COCl > -CHO > C = C > -C \equiv C -$
(B) $-CHO > -COCl > C = C > -C \equiv C-$
(C) $C = C > -CHO > -COCl > -C \equiv C-$
(D) $-C \equiv C- > C = C > -CHO > -COCl$

67. Which of the following alkenes forms formaldehyde and acetaldehyde on ozonolysis?

(A) Ethene
(B) Propene
(C) But-2-ene
(D) But-1-ene

68. Which of the following information is given by XRD technique?

(A) Structure of surface
(B) Absorption of functional group
(C) Binding nature
(D) Crystal structure

69. If the edge length of a bcc unit cell is 300 pm. Calculate the body diagonal.

(A) 600 pm
(B) 423 pm
(C) 519.6 pm
(D) 450.4 pm

70. Calculate the atomic radius of an element having edge length 3.61×10^{-8} cm for fcc structure.

(A) 1.43×10^{-8} cm
(B) 1.28×10^{-8} cm
(C) 0.90×10^{-8} cm
(D) 1.02×10^{-8} cm

71. What type of solid is the diamond?

(A) Molecular solid
(B) Metallic solid
(C) Covalent network solid
(D) Ionic solid

72. 0.5 molal aqueous solution of a weak acid (HX) is 20% ionized. If K_f for water is 1.86 K kg mol^{-1} Calculate the lowering in freezing point of the solution.

(A) 0.56 K
(B) 1.12 K
(C) -0.56 K
(D) -1.12 K

73. Which of the following laws describes the relationship between solubility of gas in a liquid and the pressure of the gas over the solution at a given temperature?

(A) Raoult's Law
(B) Henry's Law
(C) Dalton's Law
(D) Gay-Lussac's Law

74. Calculate the standard Gibbs energy for the following cell reaction,
$A(s) + B^{2+}(aq) \rightarrow A^{2+}(aq) + B(s)$, if E°_{cell} is 0.556 V.

(A) -53.65 kJ
(B) 53.65 kJ
(C) 107.31 kJ
(D) -107.31 kJ

75. The molar conductivity of 0.8 M $BaCl_2$ solution at 25°C is 220 $\Omega^{-1}cm^2mol^{-1}$. Calculate its conductivity.

(A) 0.176 $\Omega^{-1}cm^{-1}$
(B) 0.226 $\Omega^{-1}cm^{-1}$
(C) 0.252 $\Omega^{-1}cm^{-1}$
(D) 0.152 $\Omega^{-1}cm^{-1}$

76. What is the number of moles of electrons gained by n mole $PbO_{2(s)}$ when it is converted to $PbSO_{4(s)}$ at discharging of lead accumulator?

(A) $4n$
(B) $2n$
(C) n
(D) $6n$

77. The rate constant for a first order reaction is 6.93×10^{-2} per minutes. What is the time required for the completion of 99.9% of the reaction?

(A) 693 minutes
(B) 20 minutes
(C) 50 minutes
(D) 99.7 minutes

78. What is the half life of a first order reaction if time required to decrease the concentration of reactant from 0.4 M to 0.1 M is 12 minutes?

(A) 12 minutes
(B) 9 minutes
(C) 6 minutes
(D) 3 minutes

79. Which of the following statements is NOT true about the decomposition of ammonia on platinum metal?

(A) The rate of reaction is independent of the concentration of ammonia
(B) Unit of rate constant is the unit of rate of reaction
(C) Half life period of reaction is independent of the initial concentration of ammonia
(D) Order of reaction is zero

80. Identify the type of colloid having solid dispersed phase and liquid dispersion medium from following.

(A) Aerosol
(B) Emulsion
(C) Sol
(D) Foam

81. Identify the product when sulfur dioxide reacts with sodium hydroxide solution.

(A) Sodium sulfite
(B) Sodium sulfate
(C) Sodium hydrogen sulfate
(D) Sodium hydrogen sulfite

82. Which ion shows the highest magnetic moment?

(A) Ti^{3+}
(B) V^{3+}
(C) Cr^{3+}
(D) Mn^{2+}

83. Which of the following ions has the highest ionic radii?

(A) Cr^{3+}
(B) Mn^{3+}
(C) Fe^{3+}
(D) Co^{3+}

84. Identify from the following a coordinate complex containing neutral ligand in it.

(A) Pentacarbonyliron(0)
(B) Hexacyanoferrate(II)ion
(C) Trioxalatocobaltate(III)ion
(D) Sodiumhexanitrocobaltate(III)

85. What type of ligand the oxalate ion is?

(A) Monodentate
(B) Bidentate
(C) Hexadentate
(D) Ambidentate

86. Which of the following compounds forms isopropyl cyanide?

(A) CH_3-CH_2-CH_2-I and alcoholic AgCN
(B) CH_3-CHBr-CH_3 and alcoholic KCN
(C) CH_3-CHBr-CH_3 and alcoholic AgCN
(D) CH_3-CH_2-CH_2-Cl and alcoholic KCN

87. What is the correct order of reactivity of haloalkanes towards β-elimination reaction?

(A) $1^\circ > 2^\circ > 3^\circ$
(B) $3^\circ > 2^\circ > 1^\circ$
(C) $1^\circ > 3^\circ > 2^\circ$
(D) $3^\circ > 1^\circ > 2^\circ$

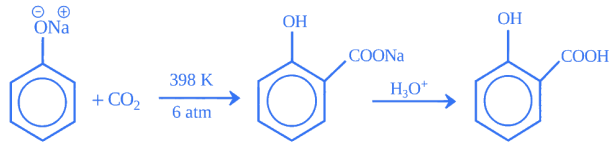
88. What is the trivial name of Ethane 1,2-di-ol?

(A) Methanol
(B) Glycol
(C) o-Toluic acid
(D) Glycerol

89. Identify the amount of Dihydrogen formed when 46 g Na (molar mass $= 23\ g\ mol^{-1}$) reacts with excess ethanol.

(A) $\frac{1}{2}$ mole
(B) 1 mole
(C) $\frac{1}{4}$ mole
(D) $\frac{1}{8}$ mole

90. Name the following reaction.



(A) Kolbe reaction
(B) Reimer - Tiemann reaction
(C) Wolff reaction
(D) Clemmensen reaction

91. Which of the following compounds will not undergo aldol condensation?

(A) CH_3-CHO (Acetaldehyde)
(B) CH_3-CO-CH_3 (Acetone)
(C) C_6H_5-CHO (Benzaldehyde)
(D) CH_3-CH_2-CHO (Propionaldehyde)

92. Which of the following reagents reacts with both aldehydes and ketones?

(A) Grignard Reagent
(B) Schiff's reagent
(C) Tollen's reagent
(D) Fehling's Solution

93. What is metaldehyde?

(A) Tetramer of acetaldehyde.
(B) Dimer of acetaldehyde.
(C) Trimer of acetaldehyde.
(D) Trimer of formaldehyde.

94. Aniline undergoes diazotization with $NaNO_2$ /HCl to give compound A. Compound A reacts with fluoroboric acid to give compound B. When B is heated with aq. $NaNO_2$ in the presence of copper, it forms compound C. Identify C.

(A) $Ar - F$
(B) $Ar - Cl$
(C) $Ar - H$
(D) $Ar - NO_2$

95. What type of amine is $(C_2H_5)_2NH$?

(A) 1° amines
(B) 3° amine
(C) 2° Unsymmetrical Amines
(D) 2° symmetrical amines

96. Identify the functional group / groups found in amino acid.

(A) COOH (B) CH_3

(C) NH_2 (D) COOH and NH_2

97. Most common secondary structure of protein Myosin in muscle and α-keratin in hair are,

(A) both α-helical (B) β-pleated, α-helical

(C) α-helical, β-pleated (D) both β-pleated

98. Which one of the following polymers is prepared by addition polymerisation?

(A) Teflon (B) Nylon-6,6

(C) Novolac (D) Dacron

99. Which is an example of thermosetting polymer?

(A) Bakelite (B) Polystyrene

(C) Nylon 6,6 (D) Polyvinyl chloride

100. What is the role of aspirin?

(A) Analgesics (B) Tranquilizer

(C) Antiseptics (D) Antibiotics

101. Identify the correct order of known species of organisms by their increasing numbers.

(A) Eubacteria - Protists - Fungi - Plants - Animals
(B) Protists - Fungi - Eubacteria - Animals - Plants
(C) Eubacteria - Fungi - Protist - Animals - Plants
(D) Fungi - Plants - Eubacteria - Protist - Animals

102. Which animal group besides *Hydra* also exhibits a diffused nervous system?

(A) Mammals
(B) Birds
(C) Ctenophora
(D) Insect

103. Match **List I with List II**.

List I	List II
(A). Protonephridia	(I). Insects
(B). Metanephridia	(II). Crustaceans
(C). Malpighian tubules	(III). Earthworm
(D). Green glands	(IV). Platyhelminthes

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

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

104. Hydrophilic nature, freely permeable and selectively permeable are the characteristics of ---------- respectively

(A) Cellulose, plasma membrane and cell wall.
(B) Cell wall, plasma membrane and pectin
(C) Cellulose, cell wall and plasma membrane
(D) Plasma membrane, cell wall and pectin

105. A wide variety of chemical substances extracted from plants on a commercial scale are known as

(A) Primary metabolites
(B) Secondary metabolites
(C) Enzymes
(D) Vitamines

106. Which chemical element is found in high amounts in nuclein?

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

107. Match **Column I with Column II**

Column I (Scientist)	Column II (Discoveries)
(A) Eduard Buchner	(I). Lock and Key hypothesis
(B) Emil Fischer	(II). Induced Fit theory
(C) Koshland	(III). K_m and Vmax concept
(D) Michaelis-Menten	(IV). Yeast fermentation

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

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

108. Study the following type of secondary metabolite and select the correct option.
i) Terpenes: Made from mevalonic acid that is composed mainly of carbon and hydrogen.
ii) Phenolics: Extremely diverse class may also contain sulphur.

(A) i is only correct.
(B) ii is only correct
(C) Both i and ii are correct
(D) Both i and ii are incorrect

109. Glycogen is stored in animal's body in ------- and -------.

(A) Kidney and Stomach
(B) Lungs and Pancreas
(C) Intestine and Heart
(D) Liver and Muscles

110. Given below are two statements:
Statement (I): Transportation in organisms and animals occurs by diffusion and by passive transport between the cells.
Statement (II): This mechanism is suitable where the surface area of body is large and the distance between parts of the body in the organism is small.
In light of the above statements, choose the *most appropriate* answer from the options given below.

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

111. Match **List I with List II**

List I (Mechanism of absorption)	List II (Substance to be absorbed)
(A). Simple diffusion	(I). Sodium
(B). Facilitated transport	(II). Glucose
(C). Active transport	(III). Fructose

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

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

112. Read the given statements:
(A). Rate of lenticular transpiration is very high.
(B). Lenticular transpiration contributes only 0.1 to 1 % of the total transpiration.
The correct statement is / are

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

113. Which of the following statements are correct?
(A). Passive absorption occurs during day time when transpiration is in progress.
(B). Passive absorption stops at night when transpiration stops.
Choose the **correct** answer from the options given below:

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

114. Path of water movement from soil to xylem is

(A) Metaxylem → Protoxylem → Cortex → Soil → Root hairs → Pericycle → Endodermis
(B) Soil → Cortex → Root hair → endodermis → Pericycle → Protoxylem → Metaxylem
(C) Soil → Root hair → Cortex → Endodermis → Pericycle → Protoxylem → Metaxylem
(D) Pericycle → Soil → Root hair → Cortex → Endodermis → Protoxylem → Metaxylem

115. Which one of the following statements is correct?
Statement (I): Facilitated diffusion is an active absorption which requires membrane protein.
Statement (II): Facilitated diffusion occurs with the help of Aquaporins and ion channels.

(A) Statement I only
(B) Statement II only
(C) Both statement I and II
(D) Neither statement I nor statement II

116. Bacteria involved in the given reaction of nitrogen cycle are
$2HNO_2 + O_2 \rightarrow 2HNO_3$

(A) *Nitrosomonas*
(B) *Nitrosococcus*
(C) Nitrobacter
(D) *Pseudomonas denitrificans*

117. Mn toxicity develops deficiency symptoms of Ca, Mg and Fe because

(A) Mn competes with Fe, Mg for translocation.
(B) Mn stimulates Ca translocation to shoot apex.
(C) It causes excess absorption of Ca, Fe and Mg.
(D) Mn competes with Fe, Mg for uptake and inhibits translocation of calcium.

118. Select the incorrect statement from the following:

(A) Water is essential for maintaining turgidity of cell.
(B) Plant can show proper growth in absence of microelements.
(C) Optimum temperature required for plant growth ranges between $25 - 35^{\circ}C$
(D) Oxygen is essential for respiration and release of energy.

119. Cytochrome C is oxidized by complex IV [cytochrome C oxidase] consisting of----

(A) Cytochrome a and a_3
(B) Cytochrome bC1 and a_3
(C) FMN
(D) Ubiquinone

120. In the ETS, electrons from $FADH_2$ enter into which complex?

(A) Complex I
(B) Complex II
(C) Complex III
(D) Complex IV

121. Which of the following reactions is the decarboxylation reaction?

(A) Oxalosuccinic acid $\rightarrow$ α-Ketoglutarate
(B) Succinic acid $\rightarrow$ Fumaric acid
(C) Cis-aconitate $\rightarrow$ Isocitric acid
(D) Isocitrate $\rightarrow$ Oxalosuccinic acid

122. During respiration, Oxidative phosphorylation occurs in

(A) Cytoplasm only
(B) Mitochondrial matrix only
(C) Inner Mitochondrial membrane only
(D) Inter membrane space of Mitochondria

123. In Yeast, the pyruvate is decarboxylated to form----

(A) Ethyl alcohol
(B) Acetaldehyde
(C) Acetyl Co-A
(D) Lactic acid

124. Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A): Leaves produce a light receiving protein that induces flowering.
Reason (R): The Protein phytochrome present in leaves detects the duration of light and dark periods and help in flowering.
In light of the above statements, choose the *correct* answer from the options given below.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) (A) is false but (R) is true.

125. Which of the following pair of plant hormones have mevalonic acid as the precursor?

(A) Auxin and cytokinin
(B) Gibberellin and Abscisic acid
(C) Ethylene and Cytokinin
(D) Auxin and Gibberellin

126. In some plants, fruits develop without fertilization because the placental tissue of unfertilized ovary produces

(A) Gibberellins
(B) Cytokinins
(C) Auxins
(D) Ethylene

127. When breast feeding is replaced by less nutritive food low in proteins and calories, the infants below the age of one year are likely to suffer from

(A) Marasmus
(B) Rickets
(C) Kwashiorkor
(D) Pellagra

128. Match **List I with List II**

List I	List II
(A). Rennin	(I). Fats emulsification
(B). Bile salts	(II). Enhances action of goblet cell
(C). Brunner's glands	(III). Hydrochloric acid
(D). Oxyntic cells	(IV). Curdling of milk

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

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

129. Parotid salivary glands occur

(A) In front of ear
(B) Below the lower jaw
(C) Below tongue
(D) At the angle of jaw

130. In mammals the teeth are
A) Of different types
B) Embedded in the socket in the jaw bones
C) Only two sets, present throughout life.
The conditions are referred as

(A) Heterodont, thecodont, diphyodont
(B) Thecodont, heterodont, diphyodont
(C) Diphyodont, thecodont, heterodont
(D) Heterodont, diphyodont, thecodont

131. Identify the INCORRECT statement:

(A) Oropharynx is the common passage for food and air
(B) Tonsils are lymphoid organs
(C) Epiglottis is a flap that prevents the entry of food into trachea
(D) Trachea is lined by complete cartilage rings

132. Which of the following doesn't happen during inspiration?

(A) The intercostal muscle contract
(B) The ribs are pulled outward
(C) The diaphragm lifts upward
(D) Volume of thoracic cavity increases

133. Match **List I with List II**

List I (Organism)	List II (Respiratory surface)
(A). Coelenterates	(I). External gills
(B). *Limulus*	(II). Plasma membrane
(C). Birds	(III). Lungs
(D). Salamander	(IV). Book gills

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

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

134. P-wave of ECG indicates:
(A). Depolarization of atrial muscles
(B). Activation of SA node
(C). Spread of excitation from AV node to SA node
(D). Repolarization of atria and depolarization of ventricles
Choose the **correct** answer from the options given below:

(A) (A), (B) and (C) are correct
(B) (C) is correct
(C) (B) and (D) are correct
(D) (A) is correct

135. Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A): Capillaries are thin walled having a single cuboidal epithelium.
Reason (R): Blood flows through the capillaries under high pressure.
In light of the above statements, choose the *correct* answer from the options given below.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) (A) is false but (R) is true.

136. Find out the correct match:

(A) Cyanophils - Shows antihistamine property
(B) Acidophils - Responsible for detoxification
(C) Neutrophils - They produce antitoxin
(D) Monocyte - Histamine secretion

137. ------differentiate into macrophages or scavenger cells which remove the damaged and dead cells to clean the body.

(A) Monocyte
(B) Lymphocyte
(C) Neutrophils
(D) Basophils

138. Given below are two statements:
Statement (I): In peritoneal dialysis, the dialyzing fluid is introduced in abdominal cavity
Statement (II): The peritoneal membrane acts as a non permeable dialyzing membrane.
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.

139. Sweat produced by the sweat glands contains

(A) NaCl, lactic acid and urea only
(B) Water, NaCl, lactic acid and urea
(C) NaCl and urea only
(D) NaOH, urea and cholesterol

140. Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A): Whenever water retention is necessary, pituitary secretes ADH
Reason (R): ADH makes the cells in the wall of collecting ducts impermeable to water.
In light of the above statements, choose the *correct* answer from the options given below.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) (A) is false but (R) is true.

141. Which is correctly matched?

(A) Glomerular filtrate - Serum with proteins
(B) Ascending limb of Loop of Henle - Permeable to water
(C) Reabsorption of sulphate - Active absorption
(D) Glomerular filtration rate - 125 ml / min

142. Which one of the following statements is INCORRECT?

(A) Renal pelvis is funnel shaped area in the region of medulla of kidney.
(B) Renal corpuscle, proximal convoluted tubule (PCT), and distal convoluted tubule (DCT) of the nephron are situated in medulla of kidney.
(C) Cortex contains Malpighian bodies, convoluted tubules and blood vessels.
(D) Glomerulus along with Bowman's capsule is called renal corpuscle.

143. Which of the following is NOT a typical symptom of Parkinson's disease?

(A) Tremors of hands
(B) Stiffness of muscles
(C) Voluntary jerky movements
(D) Difficulty in walking

144. Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A): The vestibule consists of utriculus and sacculus.
Reason (R): These structure contain macula consisting of hair cells and supporting cells.
In light of the above statements, choose the *correct* answer from the options given below.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) Both (A) and (R) are false.

145. Read the following statements and select the correct option.
(A). The narrow cavity of diencephalon is called diocoel.
(B). Metacoel is the fourth ventricle within the human brain.
(C). Aqueduct of Sylvius is also called iter.
(D). Foramen of Monro is a opening that connects the third ventricle in the diencephalon with the lateral ventricle in the cerebral hemisphere.
Choose the **correct** answer from the options given below:

(A) (A), (B), (C) are correct.
(B) (A), (B), (C) and (D) are correct
(C) (C) and (D) are incorrect.
(D) (B), (C) and (D) are correct

146. Limbic system is made up of the following EXCEPT

(A) Hypothalamus, amygdala
(B) Parts of epithalamus and thalamus
(C) Hippocampus and other areas
(D) pons varolii

147. Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A): In a chemical synapse, transmission of nerve impulse is unidirectional.
Reason (R): Only the presynaptic membrane releases neurotransmitters.
In light of the above statements, choose the *correct* answer from the options given below.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) (A) is false but (R) is true.

148. Which of the following statements about electrical synapse are CORRECT.
(A). In this type of synapse gap between the neighboring neurons is very narrow.
(B). The electrical conductive link is formed between pre and post synaptic neuron.
(C). At the gap junction, the two cells are within almost 4.8 nm distance of each other.
(D). Transmission across the gap is slower, but it depends on the connection located at the gap junctions between the two neurons.
Choose the **correct** answer from the options given below:

(A) (A) and (B) are correct
(B) (A) and (C) are correct
(C) (B) and (D) are correct
(D) (C) and (D) are correct.

149. Hormone released by posterior lobe of pituitary is concerned with

(A) Metabolism of carbohydrates
(B) Stimulation of thyroid
(C) Development of secondary sexual character
(D) Contraction of uterus

150. Identify the group which correctly represents secondary messengers involved in hormone action.

(A) ATP, DNA, RNA
(B) cAMP, Ca^{++}, cGMP, IP_3
(C) ACTH, TSH, FSH
(D) Adenylate cyclase, Phospholipase C, Protein kinase A.

151. Which hormone causes strong uterine contractions during birth?

(A) Oxytocin
(B) LH
(C) FSH
(D) Prolactin

152. Which of the following is INCORRECT for recurrent apomixis?

(A) Embryo sac generally develops from an archesporial cell
(B) Embryo sac develops from other part of the nucellus
(C) Embryo sac develops from megaspore mother cell.
(D) Embryo develops from reduced egg cell

153. Match **List I with List II**

List I (Structure)	List II (Function)
(A). Hypophysis	(I). Help in pushing embryo in the endosperm
(B). Scutellum	(II). Give rise to the part of radicle and root cap
(C). Coleorhiza	(III). Protective sheath of plumule
(D). Coleoptile	(IV). Protective sheath of radicle
(E). Suspensor	(V). Single cotyledon of monocot embryo

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

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

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

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

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

154. Arrange the following events of microsporogenesis in the correct sequence:

A) Meiosis

B) Sporogenous tissue

C) Microspore mother cell

D) Microspore tetrads

E) Pollen grain

(A) $B \rightarrow C \rightarrow A \rightarrow D \rightarrow E$

(B) $C \rightarrow A \rightarrow B \rightarrow D \rightarrow E$

(C) $A \rightarrow B \rightarrow C \rightarrow D \rightarrow E$

(D) $B \rightarrow A \rightarrow C \rightarrow D \rightarrow E$

155. Which of the following plants can lose "viability of its pollen grains just after 30 minutes of their dispersal"?

(A) Rosaceae and Leguminosae

(B) Solanaceae

(C) Rice and Wheat

(D) Rosaceae, Leguminosae and Solanaceae

156. Starting from the innermost part, the correct sequence of parts in an angiospermic ovule is

(A) Egg, nucellus, embryo sac, integument

(B) Egg, embryo sac, nucellus, integument

(C) Embryo sac, nucellus, integument, egg

(D) Egg, integument, embryo sac, nucellus

157. Which one of the following hormone combinations is essential for fetal growth and maintenance of pregnancy?

(A) FSH and LH

(B) hCG, progesterone and estrogen

(C) Oxytocin and Prolactin

(D) LH and estrogen

158. Colostrum contains

(A) Glucose, vitamins, IgG

(B) Carbohydrates

(C) Fats

(D) Proteins, Lactose, IgA

159. Identify the INCORRECT statement about zona pellucida.

(A) It has fertilizin receptor proteins (ZP 3, ZP 2)

(B) The fertilizin binds to specific protein-antifertilizin of sperm.

(C) It brings about attraction of sperms to the egg to enhance fertilization.

(D) It stimulates acrosome to release Trypsin and Pepsin

160. Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).

Assertion (A): Corpus luteum releases progesterone, small amount of estrogen and inhibin.

Reason (R): Under the influence of these hormones, the endometrial glands grow, become coiled and start uterine secretion.

In light of the above statements, choose the *correct* answer from the options given below.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).

(B) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).

(C) (A) is true but (R) is false.

(D) (A) is false but (R) is true.

161. Match **List I with List II**.

List I	List II
(A). Vaults	(I). Entry of sperm through cervix is blocked.
(B). IUDs	(II). Blockage of vas deferens
(C). Vasectomy	(III). Phagocytosis of sperms within the uterus
(D). Tubectomy	(IV). Blockage of fallopian tube

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

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

162. Diosgenin is primarily used in the manufacturing of------

(A) antibiotics
(B) birth control pills
(C) carbohydrates
(D) proteins

163. In mutation breeding, which of the following does NOT represent chemical mutagens?

(A) Colchicine
(B) Methyl methane sulphonate
(C) Sodium azide
(D) Hydroxylamine

164. Match **List I with List II**

List I (Organism)	List II (Chromosome number)
(A). *Mus musculus*	(I). 01
(B). *Homo sapiens*	(II). 10
(C). *Arabidopsis thaliana*	(III). 40
(D). *E. coli*	(IV). 46

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

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

165. Which one of the following is a mismatch?

(A) Down's syndrome - Autosomal aneuploids
(B) Klinefelter's syndrome - XO complement
(C) Haemophilia - Sex linked
(D) Turner's syndrome - Females with poor sexual development

166. Girl of normal vision whose father was colorblind marries a man of normal vision whose father was also colourblind. The sons of this marriage would be

(A) All normal visioned
(B) All colourblind
(C) 50% colourblind
(D) 25% colourblind

167. Study the following statements.
(A). Due to incomplete linkage the parental traits are inherited in offsprings.
(B). Due to incomplete linkage new traits occur in offsprings.
(C). X-chromosome of *Drosophila* males show complete linkage
(D). In *Zea mays*- color and shape of grain show complete linkage
Choose the **correct** answer from the options given below:

(A) Statements (A) and (C) are correct
(B) Statements (A) and (D) are correct.
(C) Statements (B) and (D) are incorrect.
(D) Statements (A) and (D) are incorrect.

168. In a cross between a pure tall pea plant with yellow pod and a pure short plant with green pod, how many double recessive plants would you expect in F_2 generation?

(A) One
(B) Three
(C) Four
(D) Nine

169. Match **List I with List II**

List I (Gene interaction)	List II (Examples)
(A). Holandric genes	(I). Multiple effects of a single gene
(B). Pleiotropy	(II). Hypertrichosis
(C). Multiple alleles	(III). ABO blood types

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

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

170. Autoradiography in DNA fingerprinting is used to--

(A) Detect hybridized DNA fragments using radioactive probes
(B) Cut DNA into fragments
(C) Amplify DNA
(D) Stain the DNA

171. In eukaryotes, the regulation of gene expressions can be at different levels EXCEPT:

(A) Transcriptional level
(B) Regulation of splicing
(C) DNA-replication level
(D) Transportation of m-RNA

172. In lactose operon of *E. coli*, what is the function of promoter?

(A) Binding of Gyrase enzyme
(B) Binding of RNA polymerase
(C) Codes for RNA polymerase
(D) Processing of mRNA

173. Match **List I with List II**

List I	List II
(A). Actual remains	(I). Thin carbon film
(B). Moulds	(II). They are hardened pieces of mineral matter.
(C). Cast	(III). Plants, animals and human bodies got embedded in permafrost of arctic or alpine snow.
(D). Compressions	(IV). They are hardened encasement formed in the outer parts of organic matter.

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

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

174. Which of the following characteristics features were present in *Archaeopteryx*?
(A). Long tail, claws and scales.
(B). Jaws with homodont teeth.
(C). Hind limbs modified into wings
(D). Completely fused skull bone.
Choose the **correct** answer from the options given below:

(A) (A) and (B) were present
(B) (A), (B) and (D) were present
(C) Only (D) was present
(D) (C) and (D) were present

175. Given below are two statements, one is labelled as Assertion (A) and other one labelled as Reason (R).
Assertion (A): Hot dilute soup is also called primitive broth.
Reason (R): It contains complex micromolecules like enzymes and DNA.
In light of the above statements, choose the *correct* answer from the options given below.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A).
(B) Both (A) and (R) are true but (R) is NOT the correct explanation of (A).
(C) (A) is true but (R) is false.
(D) (A) is false but (R) is true.

176. Identify the INCORRECT match:

(A) Theory of special creation - Supernatural power
(B) Cosmozoic theory - Life descended to the earth from the other planet.
(C) Abiogenesis - Life originated from living material spontaneously
(D) Biogenesis - Living organism produced from preexisting living form.

177. Arrange the following steps of the Oparin--Haldane theory in proper order and choose the correct option:
(A). Formation of first cell
(B). Origin of earth and primitive atmosphere
(C). Formation of complex organic molecules
(D). Formation of protobionts
Choose the **correct** answer from the options given below:

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

178. Match **List I with List II**

List I	List II
(A). Morphine	(I). *Atropa belladonna*
(B). Hashish	(II). *Erythroxylum*
(C). Cocaine	(III). *Cannabis sativa*
(D). Hallucinogen	(IV). *Papaver somniferum*

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

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

179. Identify the INCORRECT match:

(A) Anorexia nervosa - Emotional aversion to food.
(B) Amnesia - Loss of memory
(C) Bulimia - Loss of energy
(D) Depression - Sadness.

180. Early adolescence occurs between the ages of

(A) 5 to 9 years
(B) 10 to 14 years
(C) 15 to 17 years
(D) 18 to 19 years

181. The cells which stimulate B-lymphocytes to produce antibodies are known as

(A) Killer B-cells
(B) Helper B-cells
(C) Helper T-cells
(D) Suppressor T-cells

182. Which one of the following is a viral disease in poultry?

(A) Coccidiosis
(B) Enteritis
(C) Aspergillosis
(D) Ranikhet

183. About sericulture, identify incorrect statement.

(A) The best quality silk produce by *Bombyx mori*.
(B) Inferior quality are Tussar silk and Eri silk.
(C) The quality and quantity of silk depends on the quality of babool leaves.
(D) A little negligence can spoil the complete industry.

184. Himgiri is a hybrid variety of ____[i]____ and it is resistant to____[ii]____,

(A) (i) Cauliflower (ii) Leaf and stripe rust, hill bunt disease
(B) (i) Wheat (ii) White rust disease
(C) (i) Chilli (ii) Chilli Mosaic virus, Tobacco mosaic virus
(D) (i) Wheat (ii) Leaf and stripe rust, hill bunt disease

185. Distillation process is involved in

(A) Production of beer and wine
(B) Production of wine and rum
(C) Production of Whiskey and rum
(D) Beer and rum

186. Which of the following techniques can be used to transfer foreign DNA directly into the cell or protoplasm without the use of plasmids?
(i) Electroporation
(ii) Microinjection
(iii) Lipofection
(iv) Shot gun
(v) Ultrasonification
(vi) Biolistic method

(A) Only (i), (iii), (v)
(B) Only (ii), (iv), (vi)
(C) Only (iii), (vi)
(D) (i), (ii), (iii), (iv), (v), (vi)

187. Which of the following is INCORRECT in transformation of rDNA into suitable competent host?

(A) The transfer of rDNA into a bacterial cell is assisted by divalent Ca^{++}.
(B) The cloning of organisms used in plant biotechnology are *E. coli* and *Agrobacterium tumefaciens*.
(C) Host cell takes up naked rDNA by process called transduction.
(D) The host cell which has taken up rDNA called as transformed cell.

188. Identify the first biopatent among the following:

(A) Human insulin gene
(B) Synthetic DNA
(C) Oil clearing "*Pseudomonas*" bacterium
(D) Bt cotton gene

189. Which was the first animal used for xenotransplantation of organs and tissues for humans?

(A) Cloned pig.
(B) Cloned sheep
(C) Cloned fish
(D) Cloned cow

190. Arrange the sequence which results in killing of insects which feed on Bt plant.
(A). Midgut paralysis and cells of insect are disrupted.
(B). The insect ingests bacterial spores with cry gene present in the insect resistant transgenic plant.
(C). A combination of high pH and the enzyme proteinase of the insect's midgut, processes crystalline inclusions hydrolytically to release the core toxic fragments.

(A) (A) → (B) → (C)
(B) (B) → (A) → (C)
(C) (C) → (B) → (A)
(D) (B) → (C) → (A)

191. Select the INCORRECT pair from the following:

(A) Mutualism - Both species are benefited
(B) Commensalism - One species benefited and other is neither benefited nor harmed
(C) Parasitism - Interaction is detrimental to parasite
(D) Competition - Both species are harmed

192. Select the INCORRECT statement about *Opuntia*:

(A) Leaves are reduced to spines
(B) Leaf spines perform the function of photosynthesis
(C) *Opuntia* show CAM pathway
(D) Stomata remains closed during day time

193. Polar bears are restricted to a narrow range of temperature hence they are

(A) Eurythermal
(B) Stenothermal
(C) Euryhaline
(D) Stenohaline

194. Succession in water ultimately results in _____ condition.

(A) hydric
(B) xeric
(C) mesic
(D) saline

195. Which one of the following statements is INCORRECT about the phosphorus cycle?

(A) It is an example of sedimentary cycle
(B) Atmospheric inputs of phosphorus through rainfall are very less than carbon inputs
(C) Natural reservoir is ocean
(D) Gaseous exchange of phosphorus between organism and environment is negligible as compared to carbon.

196. The pyramid that CANNOT be inverted in a stable ecosystem, is the pyramid of

(A) Number
(B) Energy
(C) Biomass
(D) Both biomass and number

197. The available biomass after respiration of producers and other plant losses is _____.

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

198. The national forest policy, 1988 recommends ----- % forest cover for plains and ------ % forest cover for hills.

(A) 33, 67
(B) 67, 33
(C) 20, 44
(D) 30, 15

199. Intraspecific diversity : Genetic diversity : : Interspecific diversity : ----------

(A) Species diversity
(B) Ecosystem diversity
(C) Ecological diversity
(D) Allelic diversity

200. Algal bloom is caused due to

(A) Large amount of nutrients in water
(B) Large amount of toxic material in water
(C) High oxygen level in water
(D) High microbial growth in water

- End of Question Paper -