MHT CET 2025 PCB Apr 9 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 2025**, 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.

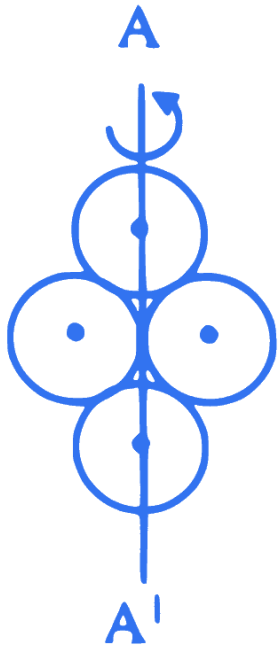
(v) Every correct answer earns **1 mark**.

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

1. When forward bias is applied to a p-n junction, then the potential barrier and the width of the depletion region respectively.

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

2. Four solid spheres each of mass ' m ' and radius ' r ' are arranged as shown in the figure. The moment of inertia of the system about the given axis of rotation AA^1 is



(A) $\frac{13}{5}mr^2$
(B) $\frac{16}{5}mr^2$
(C) $\frac{18}{5}mr^2$
(D) $\frac{21}{5}mr^2$

3. A wave is travelling in the negative x direction having displacement 3 cm along Y direction, wavelength 2π m and frequency $\left(\frac{1}{2\pi}\right)$ Hz is represented as (t = time)

(A) $3\sin(x+t)$m
(B) $3\times10^{-2}\sin(x+t)m$
(C) $3\sin(x+2t)m$
(D) $3\times10^{-3}\sin(x+2t)$m

4. A straight wire of mass ' M ' and length 2 m is placed in a magnetic field of 2 T which is acting perpendicular to the length of the wire. When a current of 1 A flows through the wire, the wire experiences an upthrust and leviates in a magnetic field. The mass ' M ' of the wire is (acceleration due to gravity g $= 10$ m/s^2)

(A) 0.4 gram
(B) 40 gram
(C) 400 gram
(D) 0.04 gram

5. A photon and an electron have equal energy ' E '. The ratio of wavelength of photon to wavelength of electron is proportional to

(A) $\frac{1}{E}$
(B) $\sqrt{E}$
(C) E
(D) $\frac{1}{\sqrt{E}}$

6. A passenger is sitting in a train which is moving fast. The engine blows a whistle of frequency ' n '. If the apparent frequency of sound heard by the passenger is n^1 then

(A) $n^1 \leq n$
(B) $n^1 < n$
(C) $n^1 > n$
(D) $n^1 = n$

7. If the shape of the liquid surface is curved, then the

(A) pressure on the convex side is equal to the atmospheric pressure.
(B) pressure on the convex side is equal to the pressure on the concave side.
(C) pressure on the concave side is greater than that on the convex side.
(D) pressure on the concave side is lesser than that on the convex side.

8. ' n ' polarising sheets are arranged such that each makes an angle 45° with the proceeding sheet. An unpolarised light of intensity I is incident into this arrangement. The output intensity is I/ 64 . The value of n will be $\left(\cos 45^\circ = 1/\sqrt{2}\right)$

(A) 6
(B) 5
(C) 4
(D) 8

9. An alternating voltage $V = 100\sqrt{2}\sin(50t)$ is connected to 2μ F capacitor through a.c. ammeter. The reading of the ammeter is

(A) 20 mA
(B) 2 mA
(C) 10 mA
(D) 0.2 mA

10. A gas at 800°C is cooled until both its pressure and volume are halved. The final temperature of the gas will be

(A) 473 K (B) 373.25 K
(C) 293.29 K (D) 268.25 K

11. When the r.m.s. velocity of a gas is denoted by ' V ' and temperature of the gas by T , which of the following relations is TRUE?

(A) $VT^2 = \text{constant}$ (B) $\frac{V}{T^2} = \text{constant}$
(C) $\frac{V^2}{T} = \text{constant}$ (D) $V^2 \cdot T = \text{constant}$

12. An inductor of 0.5 mH , capacitor of 20μ F and resistance of 20Ω are connected in series with a 220 V a.c. source. If the current is in phase with e.m.f., the maximum current in the circuit is $\sqrt{x}A$. The value of x is

(A) 2 (B) 121
(C) 242 (D) 11

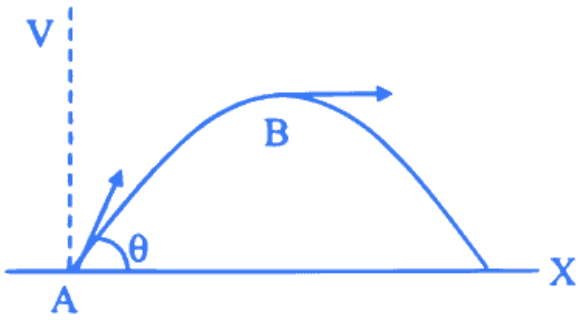
13. A particle vibrating simple harmonically has an acceleration of 16 cm/s^2, when it is at a distance of 4 cm from the mean position. Its periodic time is

(A) 1 s (B) 2.572 s
(C) 3.142 s (D) 6.028 s

14. Two inductors of 88 mH each are joined in parallel. The current passing through this combination is 4 A . The energy stored in this combination of inductors in joule is

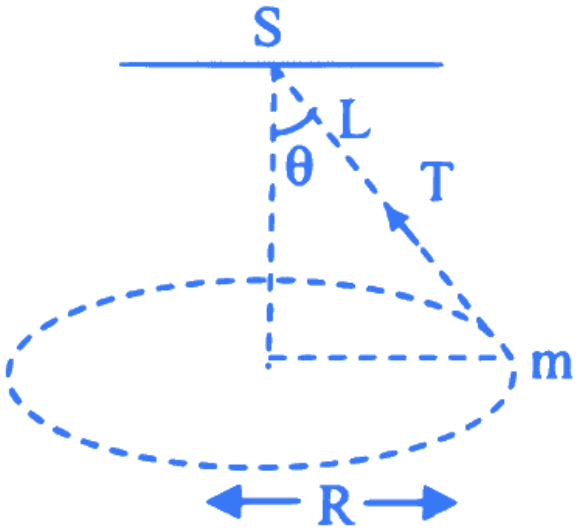
(A) 0.176 (B) 0.352
(C) 0.704 (D) 0.880

15. In a projectile motion shown in figure, which one of the following statements is NOT CORRECT?



(A) The acceleration in the vertical direction is same at points A and B .
(B) The velocity is minimum at B .
(C) The vertical velocity is same at A and B .
(D) The horizontal velocity is same at A and B.

16. A string of length L is fixed at one end and carries a mass m at the other end. The string makes $\frac{3}{\pi}$ revolutions per second around the vertical axis through the fixed end. The tension in the string is



(A) 8 mL (B) 12 mL
(C) 24 mL (D) 36 mL

17. When three capacitors of capacitances ' C ', ' 2 C '? and ' 3 C ' are connected in series. The potential difference applied across the combination is ' V '. The energy stored in the circuit is

(A) $\frac{1}{11}CV^2$ (B) $\frac{3}{11}CV^2$
(C) $\frac{5}{11}CV^2$ (D) $\frac{7}{11}CV^2$

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18. In the spectrum of hydrogen atom the ratio of the longest wavelength in the Balmer series to the longest wavelength in the Lyman series is

(A) $\frac{9}{4}$ (B) $\frac{4}{9}$

(C) $\frac{27}{5}$ (D) $\frac{5}{27}$

19. A spherical liquid drop of radius R is divided into 64 equal droplets. If surface tension is T then the work done in this process will be

(A) $8\pi R^2T$ (B) $12\pi R^2T$

(C) $4\pi R^2T$ (D) $16\pi R^2T$

20. A lens of power +5 D is put in contact with a lens of power -3 D . The combination will behave like a

(A) convergent lens of focal length 75 cm . (B) divergent lens of focal length 16 cm .

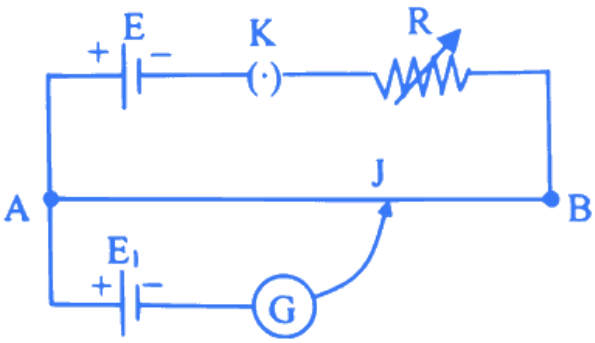
(C) convergent lens of focal length 50 cm . (D) divergent lens of focal length 40 cm .

21. A glass capillary of radius 0.35 mm is inclined at 60° with the vertical in water. The length of water column in the capillary tube is (surface tension of water $= 7 \times 10^{-2}\mathrm{Nm}^{-1}$, acceleration due to gravity $= 10\ \mathrm{m/s^2}, \cos 0° = 1, \cos 60° = 0.5$, density of water $= 1\mathrm{gram/cm^3}$)

(A) 16 cm (B) 4 cm

(C) 8 cm (D) 0.8 cm

22. In a given circuit, AB is a uniform potentiometer wire. If the value of resistance ' R ' is slightly increased, the balance point



(A) shifts towards B (B) shifts towards A

(C) will not change (D) will not be obtained

23. In common emitter configuration, $\beta, \mathrm{R_L}$ and r are the a.c. current gain, load resistance and the input resistance of a transistor respectively. The voltage and power gain respectively are

(A) $\beta\frac{r}{R_L}, \beta^2\frac{r}{R_L}$ (B) $\beta\frac{\mathrm{r}}{\mathrm{R_L}}, \beta(\frac{\mathrm{r}}{\mathrm{R_L}})^2$

(C) $\beta\frac{R_L}{r}, \beta^2\frac{R_L}{r}$ (D) $\beta\frac{R_L}{r}, \beta(\frac{R_L}{r})^2$

24. A rigid body weighs 25 gram and has a measured volume of 5 $\mathrm{cm^3}$. The possible error in the measurement of mass and volume are 0.01 gram and 0.1 $\mathrm{cm^3}$. The maximum error in the density will be

(A) 24% (B) 2.4%

(C) 4.02% (D) 2.04%

25. The average kinetic energy of a molecule of the gas is

(A) proportional to pressure. (B) proportional to volume.

(C) proportional to absolute temperature. (D) dependent on the nature of the gas.

26. In an a.c. circuit $I = 50\sin 100\pi t$. The time required for the current to achieve its peak value will be

(A) $\frac{1}{50}$ s (B) $\frac{1}{100}$ s

(C) $\frac{1}{200}$ s (D) $\frac{1}{400}$ s

27. The average velocity of a particle performing S.H.M. in one complete vibration is (A = amplitude of S.H.M., ω = angular velocity)

(A) zero (B) $\mathrm{A}\omega$

(C) $\frac{\mathrm{A}\omega}{2}$ (D) $\frac{\mathrm{A}\omega^2}{2}$

28. The range of voltmeter of resistance 300Ω is 5 V . The resistance required to be connected to convert it into an ammeter of range 5 A is nearly

(A) 1Ω in series (B) 1Ω in parallel

(C) 0.1Ω in series (D) 0.1Ω in parallel

29. The value of acceleration due to gravity (g) becomes $\left(\frac{g}{3}\right)$ at height ' h ' above the earth's surface. If ' R ' is the radius of earth, the height h will be equal to

(A) $\sqrt{3}\mathrm{R}$ (B) 3 R

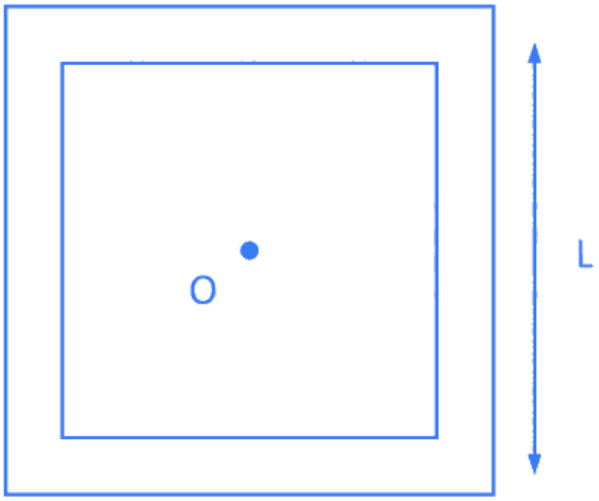
(C) $(\sqrt{3}-1)\mathrm{R}$ (D) $(\sqrt{3}+1)R$

30. A bicycle wheel of diameter ' D ' has ' N ' number of spokes. Wheel is rotating at the rate of ' x ' revolutions per minute, perpendicular to the horizontal component of earth's magnetic field ' B_H '. The e.m.f. induced between the rim and the centre of the wheel will be

(A) $\frac{B_H \pi D x}{120}$ (B) $\frac{B_H \pi D x}{240}$

(C) $\frac{B_H \pi D^2 x}{240}$ (D) $\frac{B_H \pi D^2 x}{120}$

31. Four thin rods of same mass M and same length L form a square as shown in figure. Moment of inertia of this system about an axis passing through point O and perpendicular to its plane is



(A) $\frac{4}{3}ML^2$ (B) $\frac{ML^2}{3}$

(C) $\frac{ML^2}{6}$ (D) $\frac{2}{3}ML^2$

32. Two spherical black bodies of radius R_1 and R_2 with surface temperatures T_1 and T_2 respectively. If $T_1 = 2T_2$ and they radiate the same power then relation between R_1 and R_2 is

(A) $R_2 = 8R_1$ (B) $R_2 = R_1$

(C) $R_2 = 2R_1$ (D) $R_2 = 4R_1$

33. A simple pendulum has mass 2 gram and charge $2\mu C$. In a uniform horizontal electric field of intensity $1000\ V/m$, pendulum is at rest. At equilibrium, the angle made by the pendulum with the vertical is (g = acceleration due to gravity $= 10\ m/s^2$)

(A) $\tan^{-1}(0.2)$ (B) $\tan^{-1}(0.1)$

(C) $\tan^{-1}(0.4)$ (D) $\tan^{-1}(0.5)$

34. A mass ' M ' is suspended from a spring of negligible mass. The spring is pulled a little and then released so that the mass executes S.H.M. of periodic time ' T '. If the mass is increased by ' m ', the time period becomes $4T/3$, then the ratio of $\frac{M}{m}$ is

(A) 3 : 1 (B) 9 : 7

(C) 7 : 9 (D) 1 : 3

35. The energy of a photon is equal to the kinetic energy of proton. If λ_1 is the de-Broglie wavelength of a proton, λ_2 is the wavelength associated with the photon and if E is the energy of photon then $\lambda_2 : \lambda_1$ is

(A) $1 : \sqrt{3E}$ (B) $1 : \sqrt{E}$

(C) $\sqrt{E} : 1$ (D) $\sqrt{3E} : 1$

36. In an adiabatic change, the pressure and temperature of a diatomic gas are related as $P \propto T^c$, where c is a constant. The value of c is (consider gas molecules are rigid)

(A) $\frac{9}{7}$ (B) $\frac{7}{2}$

(C) $\frac{5}{2}$ (D) $\frac{4}{3}$

37. If $|\vec{A} \times \vec{B}| = \sqrt{3}(\vec{A} \cdot \vec{B})$ then the value of $|\vec{A} + \vec{B}|$ is $(\tan 60^\circ = \sqrt{3}, \cos 60^\circ = 0.5)$

(A) $(A^2 + B^2 + \frac{AB}{\sqrt{3}})^{\frac{1}{2}}$

(B) $(A^2 + B^2 + AB)^{\frac{1}{2}}$

(C) $(A^2 + B^2 + \sqrt{3}\ AB)^{\frac{1}{2}}$

(D) A + B

38. In an interference experiment, the phase difference between the waves reaching a first dark point is

(A) zero (B) π^c

(C) $(\frac{3\pi}{2})^c$ (D) $(2\pi)^c$

39. The magnetic field at the centre of a current carrying circular coil of area ' A ' is ' B '. The magnetic moment of the coil is x times $(2B/\mu_0)$. The value of x is (μ_0 = permeability of free space)

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

(C) $(\frac{\pi^2}{A^2})^{\frac{1}{3}}$ (D) $(\frac{A^3}{\pi})^{\frac{1}{2}}$

40. A capacitor of capacitance ' C ' is connected across a.c. source of voltage V as $V = V_0 \sin \omega t$. The displacement current between the plates of the capacitor would be

(A) $V_0 \omega C \cos \omega t$ (B) $\frac{V_0}{\omega C} \sin \omega t$

(C) $\frac{V_0}{\omega C} \cos \omega t$ (D) $V_0 \omega C \sin \omega t$

41. The series limit for the frequency of Balmer series is ' v_B ', then the series limit frequency of Paschen series ' v_p ' is

(A) $\frac{2}{9} v_B$ (B) $\frac{9}{4} v_B$

(C) $\frac{4}{9} v_B$ (D) $\frac{2}{3} V_B$

42. In Young's double slit experiment, the intensities at two points, for the path difference $\frac{\lambda}{4}$ and $\frac{\lambda}{3}$ are I_1 and I_2 respectively. If I_0 denotes the intensity produced by each one of the individual slits then the ratio $(I_1 + I_2) : I_0$ is $\left(\cos 45^\circ = 1/\sqrt{2}\right) (\cos 60^\circ = 0.5)$

(A) 2 (B) 3

(C) 4 (D) 1

43. A system is compressed adiabatically, then its temperature

(A) increases. (B) decreases.

(C) becomes zero. (D) remains constant.

44. A solenoid has core of a material with relative permeability 301 and its winding carries a current of 2 A . The number of turns of the solenoid is 600 per metre. The magnetization of the material is

(A) 3.6×10^{-5} A/m (B) 3.6×10^{5} A/m

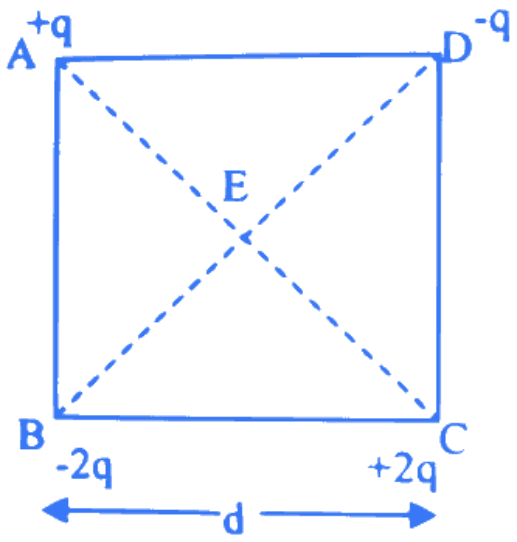
(C) 1.8×10^{-5} A/m (D) 1.8×10^{5} A/m

45. Two points on a travelling wave having frequency 500 Hz and velocity 300 m/s are 30° out of phase, then the minimum distance between the two points is

(A) 0.02 m (B) 0.01 m

(C) 0.05 m (D) 0.1 m

46. The charges are arranged at the four corners of square $ABCD$ of side ' d ' as shown in figure. The work required to put this arrangement together is given by



(A) $\frac{-9q^2}{4\pi\epsilon_0 d}$ (B) $\frac{-7q^2}{4\pi\epsilon_0 d}$

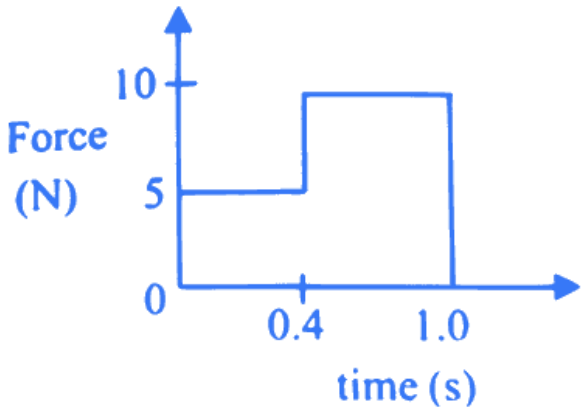
(C) $\frac{-q^2}{4\pi\epsilon_0 d}[9 - 2\sqrt{2}]$ (D) $\frac{-q^2}{4\pi\epsilon_0 d}[9 + 2\sqrt{2}]$

47. If current ' i ' is passing through the solenoid of diameter ' d ' having number of turns per unit length ' n ', then the inductance per unit length near the middle of a long solenoid is directly proportional to

(A) d and n (B) d^2 and n

(C) d and n^2 (D) d^2 and n^2

48. Force is applied to a body of mass 2 kg at rest on a frictionless horizontal surface as shown in the force against time (F – t) graph. The speed of the body after 1 s is



(A) 2 m/s (B) 4 m/s

(C) 6 m/s (D) 10 m/s

49. The order of (a) transformer (b) diode rectifier (c) filter (d) voltage regulator in a block diagram of simple rectifier circuit is as

(a) b, d, c, a
(b) a, c, d, b
(c) a, b, c, d
(d) d, c, a, b

(A) d
(B) a
(C) c
(D) b

50. A simple harmonic progressive wave is given by $y = A\sin 2\pi\left(nt - \frac{x}{\lambda}\right)$. If the wave velocity is equal to $= \frac{1}{3}$ (maximum particle velocity) then the wavelength λ is given by

(A) $\frac{2\pi A}{3}$
(B) $\frac{\pi A}{3}$
(C) $\frac{5\pi A}{3}$
(D) $\frac{7\pi A}{3}$

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51. Which of the following is water gas shift reaction?

(A) $2H_2O_{(l)} \xrightarrow{\text{electrolysis}} 2H_2(g) + O_2(g)$

(B) $CH_{4(g)} + H_2O_{(g)} \xrightarrow{Ni} CO_{(g)} + 3H_{2(g)}$

(C) $C_{(s)} + H_2O_{(g)} \longrightarrow CO_{(g)} + H_{2(g)}$

(D) $CO_{(g)} + H_2O_{(g)} \xrightarrow[\text{Iron chromate}]{673\ K} CO_{2(g)} + H_{2(g)}$

52. Which from following amino acids is synthesized in our body?

(A) Proline (B) Phenylalanine

(C) Methionine (D) Valine

53. Calculate the energy of photon in electromagnetic radiation having wavelength 400 nm $\left(h = 6.626 \times 10^{-34} Js; c = 3 \times 10^{8}\ ms^{-1}\right)$.

(A) 4.061×10^{-19} J (B) 4.969×10^{-19} J

(C) 5.226×10^{-19} J (D) 4.118×10^{-19} J

54. The conductivity of 0.1 M KCl solution at $23^{\circ}C$ is $0.012\Omega^{-1}\ cm^{-1}$.
Resistance of a cell containing the solution at same temperature was found to be 50Ω. Calculate the cell constant.

(A) $0.60\ cm^{-1}$ (B) $2.4 \times 10^{-4}\ cm^{-1}$

(C) $6.0 \times 10^{-4}\ cm^{-1}$ (D) $2.4 \times 10^{-2}\ cm^{-1}$

55. 60% of a first order reaction is completed in 60 minute. What is the time taken by reactant to decompose half of its original amount?

(A) 30.6 minute (B) 20.2 minute

(C) 45.3 minute (D) 60.1 minute

56. The osmotic pressure of equimolar concentration of $CaCl_2$ and urea at same temperature are 0.6 atm and 0.25 atm respectively. Calculate van't Hoff factor for $CaCl_2$.

(A) 2.0 (B) 2.4

(C) 2.7 (D) 3.0

57. Which from following is an example of intensive property?

(A) Density (B) Mass

(C) Internal energy (D) Number of moles

58. What is EAN of Mn in $Mn(CO)_5$?

(A) 35 (B) 36

(C) 34 (D) 37

59. Which of the following on reaction with Grignards reagent followed by hydrolysis forms secondary alcohol?

(A) HCHO

(B) $CH_3 - CHO$

(C) $CH_3 - CO - CH_3$

(D) $CH_3 - CH_2 - CO - CH_3$

60. Identify inner transition element from following.

(A) Hf (B) Mo

(C) No (D) Zr

61. Identify the electrolyte from following so that $\wedge_0$ is not obtained from the graphical variation of $\wedge$ against $\sqrt{C}$?

(A) KCl (B) H_2SO_4

(C) CH_3COOK (D) NH_4OH

62. Identify the quantity of carbohydrate units formed after hydrolysis of n mole lactose.

(A) $2n$ Glucose (B) n Glucose $+n$ Galactose

(C) 3n Glucose (D) n Glucose $+n$ fructose

63. 24 g carbon react with oxygen to produce 88 g carbon dioxide. Find the amount of oxygen used.

(A) 16 g (B) 32 g

(C) 48 g (D) 64 g

64. Which of the following statements is NOT true about vacancy defect?

(A) It arises when a particle is missing from its regular site in the crystal lattice during crystallisation.

(B) The vacancy defect can also be developed when the substance is heated.

(C) In this the mass of substance decreases.

(D) The density of crystal remains same when vacancy defect is created.

65. Which of the following is the most abundant chalcogens?

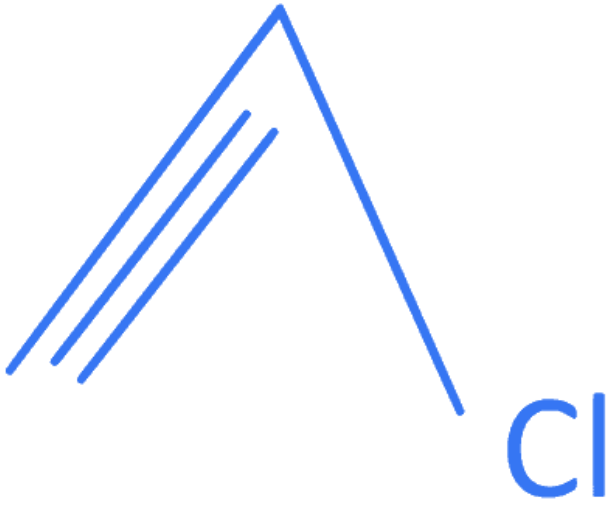
(A) Oxygen

(B) Sulphur

(C) Selenium

(D) Tellurium

66. What is the number of moles of ' C ' atoms and ' H ' atoms respectively present in n mole molecule represented as follows?



(A) n and n

(B) $2n$ and $2n$

(C) $2n$ and n

(D) $3n$ and n

67. For a certain reaction, $\Delta H^\circ = 219\ kJ$ and $\Delta S^\circ = -21 JK^{-1}$. Find the value of ΔG°.

(A) 202.74 kJ

(B) -312.74 kJ

(C) 225.26 kJ

(D) -325.06 kJ

68. Identify product P in following reaction. Acetamide $+4[H] \xrightarrow{Na_2-C_2H_5OH} P$

(A) Methanamine

(B) Acetonitrile

(C) Ethanamine

(D) Ethanoic acid

69. What is IUPAC name of glyoxal?

(A) Ethanedial

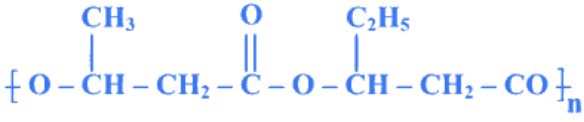
(B) Propanedial

(C) Prop-2-enal

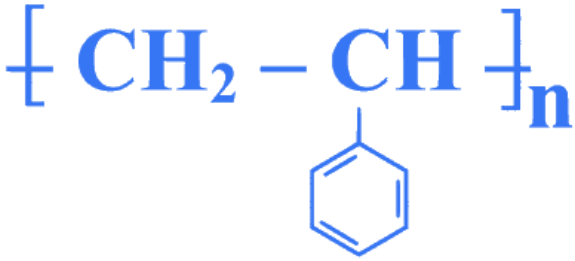
(D) 2-Methylpropanal

70. Which from following is a biodegradable polymer?

(A)



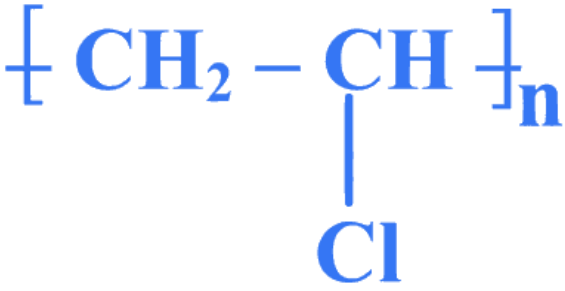
(B)



(C)



(D)



71. Identify an aldehyde used in margarine and food for its buttery odour.

(A) Benzaldehyde

(B) Butyraldehyde

(C) Cinnamaldehyde

(D) Oxaldehyde

72. Consider the reaction

$$3I^-_{(aq)} + S_2O^{--}_{8(aq)} \longrightarrow I^-_{3(aq)} + 2SO^{2-}_{4(aq)}$$

rate of formation of SO_4^{2-} at a particular time is

$$2.2 \times 10^{-2}\ moldm^{-3}\ s^{-1}$$

What is the value of $\frac{d}{dt}\left[I_3^-\right]$?

(A) $1.1 \times 10^{-2}\ moldm^{-3}\ s^{-1}$

(B) $2.2 \times 10^{-2}\ moldm^{-3}\ s^{-1}$

(C) $3.3 \times 10^{-2}\ moldm^{-3}\ s^{-1}$

(D) $4.4 \times 10^{-2}\ moldm^{-3}\ s^{-1}$

73. Calculate the number of electrons required to reduce completely 0.1 molAl^{+3} ions from aqueous $Al_2(SO_4)_3$ solution.

(A) 1.806×10^{23} (B) 3.011×10^{22}

(C) 6.022×10^{22} (D) 3.011×10^{23}

74. Which of the following compounds has highest lattice energy?

(A) CsF (B) KF

(C) NaF (D) RbF

75. Identify linear polymer from following.

(A) High density polymer (B) Low density polymer

(C) Bakelite (D) Melamine

76. What is the maximum number of ester linkages in a triglyceride?

(A) 4 (B) 3

(C) 2 (D) 1

77. Identify the compound from following so that Ostwald's dilution law is NOT applicable to it.

(A) NaOH (B) NH_4OH

(C) H_2CO_3 (D) H_2S

78. What is the number of alkyl groups attached with N -atom of amines formed when 4 n moles of alkyl halide treated with n mole alc. NH_3 at 373 K ?

(A) 4 (B) 3

(C) 2 (D) 1

79. Which among the following is vinylic halide?

(A) $CH_2 = CH - CH_2 - X$

(B) $CH_3 - CH = CH - X$

(C) $CH_3 - C \equiv C - X$

(D) $C_6H_5 - CH_2 - X$

80. Which from following is a transition element and also included as post actinoid element?

(A) Rf (B) Lu

(C) Cd (D) Hf

81. What is the number of electrons released in conversion of $C_2O_4^{2-}$ to CO_2 ?

(A) 2 (B) 4

(C) 6 (D) 5

82. Which from following is the strongest haloacetic acid?

(A) Fluoroacetic acid (B) Bromoacetic acid

(C) Chloroacetic acid (D) Iodoacetic acid

83. Which of the following alkanes does NOT exhibit structural isomerism?

(A) Propane (B) Butane

(C) Pentane (D) Hexane

84. Calculate the volume occupied by a particle in simple cubic unit cell if the total volume of unit cell is 4.0×10^{-23} cm^3.

(A) 1.5×10^{-23} cm^3 (B) 2.9×10^{-23} cm^3

(C) 2.1×10^{-23} cm^3 (D) 3.7×10^{-23} cm^3

85. Which of the following gas has high percentage by volume in air?

(A) O_2 (B) N_2

(C) CO_2 (D) Ar

86. The rate law for the reaction, $x\,A + y\,B \longrightarrow mP + nQ$, is $r = k[A]^c \times [B]^d$ What is the overall order of reaction?

(A) $(x + y)$ (B) $(m + n)$

(C) (c + d) (D) $\frac{x}{y}$

87. Calculate the molal elevation constant of water if boiling point of 0.7 m solution of non volatile solute is 373.5 K .
[Boiling point of water = 373.15 K]

(A) 0.4 K kg mol^{-1} (B) 0.25 K kg mol^{-1}

(C) 0.5 K kg mol^{-1} (D) 0.60 K kg mol^{-1}

88. Calculate the work done in following reaction.

$$C_2H_{4(g)} + HCl_{(g)} \longrightarrow C_2H_5Cl_{(g)} \text{ at } 27^\circ C.$$

$$\left(R = 8.314\ J\ K^{-1}\ mol^{-1}\right)$$

(A) 4988.4 J (B) -1247.1 J

(C) 2494.2 J (D) 3741.3 J

89. At 298 K pH of a solution is 13 . What is the number of H_3O^+ions present in one mL of this solution?

(A) 6.022×10^7 (B) 5.020×10^8

(C) 7.022×10^{13} (D) 1×10^{13}

90. Which of the following compounds has highest boiling point?

(A) 1-Bromobutane
(B) 1-Bromo-2-methylpropane
(C) 2-Bromobutane
(D) 2-Bromo-2-methylpropane

91. Identify the ligands present Pentaamminecarbonatocobalt(III)chloride.

(A) NH_3 and Cl^-
(B) Cl^- and CO_3^{--}
(C) CO_3^{--} and NH_3
(D) NH_3, CO_3^{--} and Cl^-

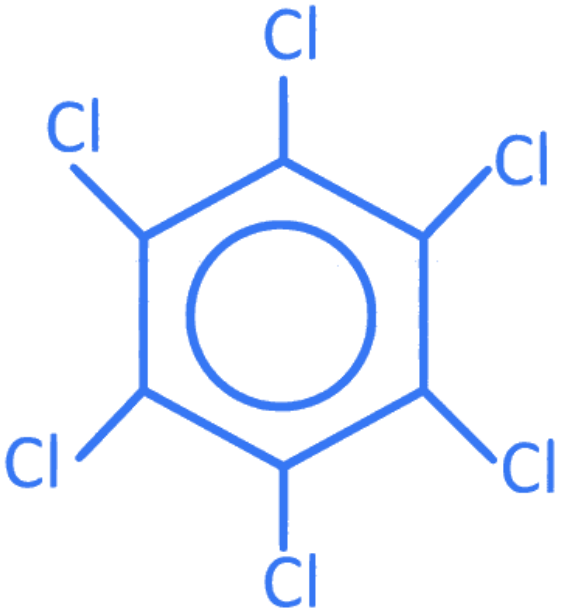
92. Identify zero-dimensional nanostructure from examples given below.

(A) Nanotubes
(B) Fibres
(C) Nanowires
(D) Quantum dot

93. Which of the following is false regarding adsorption?

(A) Concentration of adsorbate is high only at the surface of adsorbent.
(B) It is dependent on temperature and pressure.
(C) It is accompanied by evolution of heat.
(D) It is independent of surface area.

94. What is the molecular formula of following compound?



(A) $C_6H_6Cl_6$
(B) C_6Cl_6
(C) $C_6H_{12}Cl_6$
(D) $C_6H_3Cl_6$

95. What is the name of t-butyl alcohol according to carbinol system?

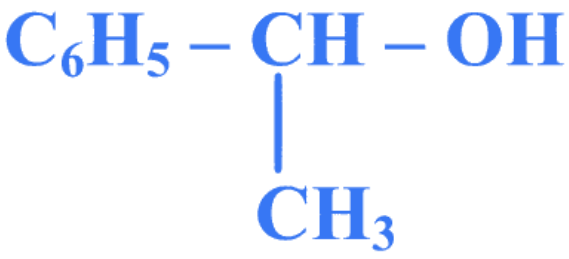
(A) Methyl carbinol
(B) Ethyl carbinol
(C) Propyl carbinol
(D) Trimethyl carbinol

96. In ionic solid, anions are arranged in ccp array and cations occupy all the octahedral voids. What is the formula of ionic compound? [consider A = cation; B = anion]

(A) AB_3
(B) A_2B_3
(C) AB_4
(D) AB

97. Which of the following is secondary benzylic alcohol?

(A) $C_6H_5CH_2 - OH$
(B) $C_6H_5CH_2 - CH_2 - OH$



(C)
(D) $C_6H_5 - C - (CH_3)_2 - OH$

98. Which of the following hydride of chalcogens has lowest bond angle and highest bond length?

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

99. What type of solution is the benzoic acid in benzene?

(A) Solid as solvent and solid as solute.
(B) Liquid as solvent and solid as solute.
(C) Solid as solvent and liquid as solute.
(D) Liquid as solute and liquid as solvent.

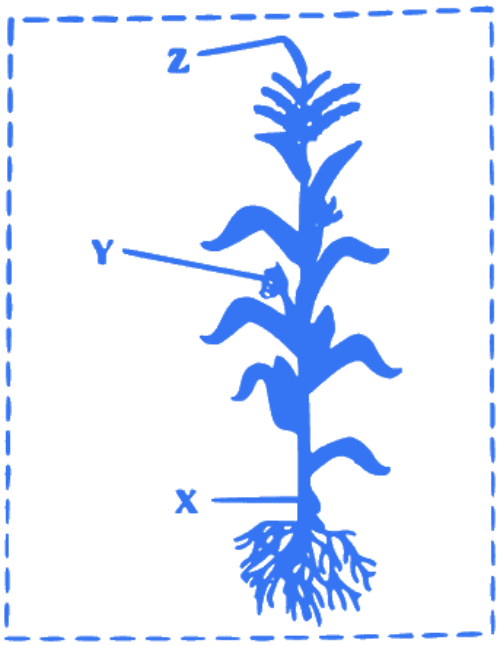
100. The solubility product of PbI_2 is 2.8×10^{-8}. Calculate its solubility in $moldm^{-3}$.

(A) 1.323×10^{-3}
(B) 1.912×10^{-3}
(C) 7.912×10^{-3}
(D) 7.323×10^{-23}

101. Any foreign substance invading body and capable of stimulating an immune response is _____ .

(A) antibody
(B) antibiotic
(C) antigen
(D) anticoagulant

102. Identify the labels ' X ', 'Y' and ' Z ' in following figure.



(A) X - Styles, Y - Prop roots, Z - Tassel
(B) X - Prop roots, Y - Styles, Z - Tassel
(C) X - Prop roots, Y - Tassel, Z - Styles
(D) X - Tassel, Y - Prop roots, Z - Styles

103. Which of the following statements are correct regarding chromosomal basis of sex determination?
i. The mechanism of sex determination in insect is XX - XO type.
ii. In honey-bee, haplo-diploid type of sex determination is observed.
iii. Human males have homomorphic sex chromosomes.
iv. Human females have heteromorphic sex chromosomes.
v. Chromosomal mechanism of sex determination in birds is ZW-ZZ type.

(A) i, ii and v only
(B) iii and iv only
(C) i, ii and iv only
(D) ii, iv and v only

104. Which of the following is INCORRECT in case of severe haemorrhage?

(A) Osmoreceptors in hypothalamus stimulate ADH secretion.
(B) ADH stimulates reabsorption of water from last part of DCT and entire collecting duct.
(C) Urine volume increases.
(D) Osmolarity of blood decreases.

105. Select the INCORRECT statements.
i. The rate of formation of H_2CO_3 is slower in RBCs and faster in plasma.
ii. Dissociation of H_2CO_3 into $H^+$and HCO_3^- takes place due to carbonic anhydrase.
iii. The carbonic anhydrase is present in leucocytes,
iv. The prosthetic group of carbonic anhydrase is Mn .
Select the correct option.

(A) i and iv only
(B) ii and iii only
(C) i, iii and iv only
(D) i, ii and iv only

106. Following table shows ABO blood group in man. Observe carefully and identify 'P', 'Q' and ' R '.

Genotype	Antigen on surface of RBC	Antibody in serum
$I^A I^O$	A	R
$I^B I^O$	B	Antibody a
P	A and B	NIL
$I^O I^O$	Q	Both Antibody a And Antibody b

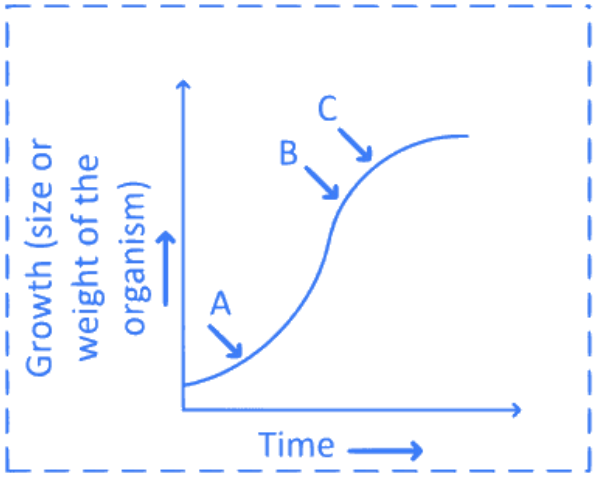
(A) $P - I^AI^A, Q - AB, R -$ antibody a

(B) $P - I^AI^B, Q -$ NIL, R– antibody b

(C) $P - I^BI^B, Q - B, R -$ NIL

(D) $P - I^OI^A, Q - A, R-$ antibody ab

107. In the above logistic growth curve of population, identify ' A ', ' B ' and ' C '.



(A) A - Stationary phase, B - Log phase, C - Lag phase

(B) A - Lag phase, B - exponential phase, C - Stationary phase

(C) A - Log phase, B - Lag phase, C - Diminishing growth phase

(D) A - Log phase, B - Stationary phase, C - Lag phase

108. Given below are two statements.
Statement I - Wall of the left ventricle is more muscular and about three times thicker than that of the right ventricle.
Statement II - Columnae carneae are present in the wall of atria as well as ventricles.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.

(B) Both statement I and statement II are incorrect.

(C) Statement I is correct but statement II is incorrect.

(D) Statement I is incorrect but statement II is correct.

109. Following changes occur during the successive seral stages of ecological succession EXCEPT _____

(A) change in the diversity of species of organism.

(B) decrease in total biomass.

(C) increase in total biomass.

(D) increase in the number of species and organisms.

110. What is the time duration required for completion of one PCR Cycle?

(A) 1 to 2 minutes

(B) 3 to 4 minutes

(C) 5 to 6 minutes

(D) 7 to 8 minutes

111. Gland which was considered vestigial but later found to produce melatonin is _____

(A) Thyroid gland

(B) Pineal gland

(C) Pituitary gland

(D) Parathyroid gland

112. Stomatal transpiration takes place during day time in the following plants EXCEPT _____

(A) lotus

(B) mango

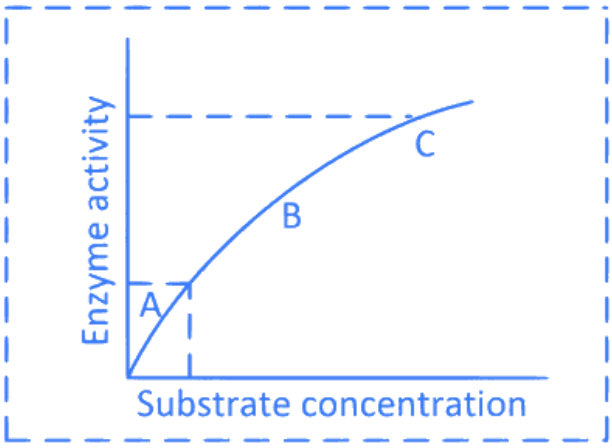
(C) grass

(D) cactus

113. Given below are two statements.
Statement I - Defective development of foetus is examined by amniocentesis.
Statement II - Defective foetus can be terminated after 20 weeks of pregnancy.
In the light of above statements, select the correct option given below:

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

114. A graph shows effect of substrate concentration on enzyme activity. In this graph ' Y ' axis represents.



(A) Temperature
(B) Velocity of reaction
(C) Time
(D) pH

115. When a biotic agent is bat, the pollination is called

(A) ornithophily
(B) entomophily
(C) anemophily
(D) chiropterophily

116. In Glycolysis, which one of the following conversion shows ATP formation?

(A) Glucose- 6 - phosphate → Fructose - 6 phosphate
(B) 3-PGA → 2-PGA
(C) Phosphoenol pyruvate → Pyruvate
(D) 2 - PGA → 2 - Phosphoenol pyruvate

117. Match the Columns I, II and III based an excretion.

Column I (Part of Nephron)		**Column II (Type of cells)**		**Column III (Function)**	
a.	Bownman's capsule	(i)	Squamous epitheli-um	p.	passage of filterate
b.	Neck of nephron	(ii)	Cuboidal epitheli-um	q.	selective reabsorp-tion
c.	Proximal convolut-ed tubule	(iii)	Ciliated epitheli-um	r.	filtration of blood

(A) a – i – r, b – ii – q, c – iii – p
(B) $a - ii - p, b - i - q, c - iii - r$
(C) $a - i - r, b - iii - p, c - ii - q$
(D) a - ii - q, b - iii - p, c-i - r

118. Which type of mutation causes sickle cell anaemia?

(A) Inversion
(B) Duplication
(C) Frame - shift
(D) Point

119. Which of the following is NOT an acrosomal reaction?

(A) Formation of cone of reception.
(B) Production of weak wave of depolarization in egg.
(C) Release of zona lysin.
(D) Formation of fertilizin - antifertilizin complex.

120. Growth of the pollen tube in ovule is guided by the secretions of

(A) polar nuclei
(B) egg
(C) antipodals
(D) synergids

121. Which of the following is NOT the function of erythrocytes?

(A) Transport of CO_2
(B) Maintenance of viscosity of blood
(C) Maintenance of pH of blood
(D) Secretion of antitoxins

122. If dark period is interrupted by a flash of red light of 660 nm , then SDP will not flower. But if it is immediately followed by _____ then SDP will flower.

(A) far red light of 660 nm
(B) far red light of 730 nm
(C) red light of 660 nm
(D) red light of 730 nm

123. The purposeful manipulation in the heredity of crops and the production of new superior varieties of existing crop plants is called _____

(A) genetics
(B) traditional biotechnology
(C) horticulture
(D) plant breeding

124.

The quantity of CO and hydrocarbons in the exhaust of a motor vehicle can be reduced by installing _____ in it.
i. a scrubber
ii. an electrostatic precipitator
iii. a catalytic converter
Select the correct option:

(A) iii only
(B) ii and iii
(C) i only
(D) i and ii

125. Given below is a list of hormones. How many of the following are hypothalamic hormones?
i. Thyroid stimulating Hormone.
ii. Follicle stimulating hormone.
iii. Oxytocin
iv. Collip's hormone
v. Prolactostatin
vi. Gonadotropin Releasing hormone
vii. Adrenocorticotropin releasing hormone.
Select the correct option:

(A) 2
(B) 3
(C) 4
(D) 6

126. If you cross two heterozygous plants, how many of the all possible F_1 offsprings will also be heterozygous?

(A) All
(B) Half
(C) $3/4^{th}$
(D) $1/4^{th}$

127. Small intestine opens into large intestine at the junction of _____

(A) duodenum and jejunum
(B) Stomach and duodenum
(C) ileum and caecum
(D) jejunum and ileum

128. Which one of the following is NOT a prime element?

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

129. Germ pores of pollen grains are useful for

(A) absorption of water during seed germination
(B) emerging of radicle during seed germination
(C) entry of pollen tube into ovule
(D) growth of emerging pollen tube during germination of pollen grains

130. Primary urine contains all of the following, EXCEPT

(A) Blood cells and vitamins
(B) Proteins and amino acids
(C) Glucose and sulphate salts
(D) Blood cells and macro molecules like proteins

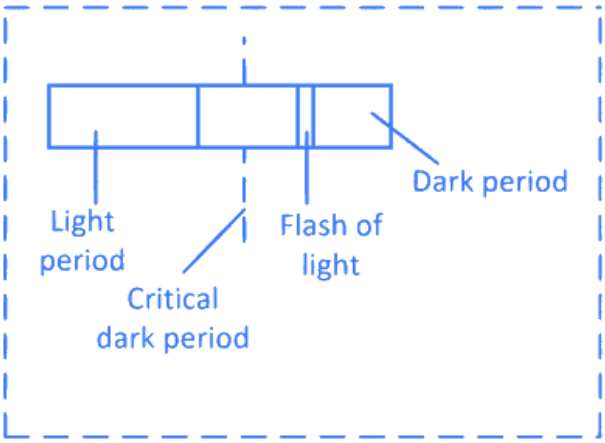
131. Given below are two statements.
Statement I - The long term storage places like sediments and oceanic water are termed as 'sinks'.
Statement II - Human activities like fossil fuel burning and deforestation have affected the global carbon cycle.
In the light of above statements, select the correct option given below:

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

132. Resting potential of an axon is _____ .

(A) -20 millivolts
(B) -70 millivolts
(C) +60 millivolts
(D) +140 millivolts

133. The figure shows photoperiodism. Identify its correct explanation from the following.



(A) Short day plants flower
(B) Short day plants do not flower
(C) Long day plants do not flower
(D) Day neutral plants do not flower

134. Given below are two statements.
Statement I - In the follicular phase of menstrual cycle, the thickness of endometrium reaches 3 – 5 mm.
Statement II - FSH stimulates 6-12 primary follicles to proceed in development to form secondary follicles.
In the light of above statements, Select the correct option given below:

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

135. Water constitutes about _____to _____ % of plant cells and tissues.

(A) 50 to 60
(B) 65 to 70
(C) 75 to 85
(D) 90 to 95

136. Arrange the following events of chemical evolution in proper sequence.
i. formation of nucleic acid
ii. formation of eobionts
iii. formation of protocell
iv. formation of complex organic compounds

(A) i → iii → iv → ii
(B) iv → i → iii → ii
(C) ii → iii → i → iv
(D) ii → i → iii → iv

137. A molecule of triglyceride is composed of

(A) one glycerol and three fatty acids
(B) one glycerol and one fatty acid
(C) one glycerol and two fatty acids
(D) three glycerol and one fatty acid

138. About _____ percentage of starch gets converted to maltose in mouth.

(A) 10%
(B) 20%
(C) 30%
(D) 50%

139. Total number of ATP molecules formed by substrate level phosphorylation in complete oxidation of one glucose molecule are _____.

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

140. Which of the following pairs are haploid structures?

(A) Nucellus and microspore
(B) Antipodal cells and megaspore mother cells
(C) Nucellus and antipodal cells
(D) Egg cell and antipodal cells

141. Match the Column I and II

Column (I)		**Column (II)**	
i.	CO_2 dissolved in plasma	a.	23 %
ii.	CO_2 transported as bicarbonate ions	b.	7 %
iii.	CO_2 transported by RBC as carbaminohaemoglobin	c.	70 %
iv.	O_2 transportation by RBCs as oxyhaemoglobin	d.	97 %

Choose the correct option:

(A) i - b, ii - c, iii - d, iv - a
(B) i - b, ii - a, iii - c, iv - d
(C) i-c, ii-d, iii-a, iv-b
(D) i - b, ii - c, iii - a, iv - d

142. Subcutaneous Filariasis is caused by _____

(A) Plasmodium vivax
(B) Loa loa
(C) Ascaris lumbricoides
(D) Entamoeba histolytica

143. Which of the following organic acid is used in medicine for solubility of Ca^{++}?

(A) Citric acid (B) Gluconic acid

(C) Fumaric acid (D) Acetic acid

144. Given below are two statements.
Statement I - The recognition sites of RENs are 4-8 nucleotides bps long and are characterized by a particular type of internal symmetry.
Statement II - Different restriction enzymes found in different organisms recognise different nucleotide sequences and cut the DNA at different sites.
In the light of above statements, select the correct option given below:

(A) Both statement I and statement II are correct.

(B) Both statement I and statement II are incorrect.

(C) Statement I is correct but statement II is incorrect.

(D) Statement I is incorrect but statement II is correct.

145. Which one of the following neurohypophyseal hormones brings about increase in BP?

(A) Antidiuretic Hormone

(B) Aldosterone

(C) Oxytocin

(D) ACTH

146. Glycine is coded by GGA in prokaryotic cell, it will code for _____ in eukaryotic cell.

(A) Leucine (B) Valine

(C) Glycine (D) Alanine

147. Sexually reproduced offsprings tend to differ from their parents. This is known as _____

(A) cloning (B) mutation

(C) heredity (D) variation

148. Which of the following is correct regarding cystine stones?
i. These are formed in response to bacterial infection.
ii. It is a genetic disorder.
iii. These grow quickly and become quite large.
iv. Occurs in people who consume high protein diet.
v. People who suffer excrete too much of certain amino acid.

(A) i and ii only (B) ii, iii and iv only

(C) iii and v only (D) ii and v only

149. Which one of the following enters mitochondrial matrix after glycolysis?

(A) Glucose (B) Pyruvic acid

(C) Acetyl CoA (D) Oxaloacetic acid

150. Match a type of artificial method of vegetative reproduction given in Column I with examples given in Column II.

Column (I)		**Column (II)**	
i.	Root cutting	a.	Apple
ii.	Bud grafting	b.	Sansevieria
iii.	Stem cutting	c.	Blackberry
iv.	Leaf cutting	d.	Rose

Choose the correct option:

(A) i - c, ii - d, iii - a, iv - b

(B) i - c, ii - b, iii - d, iv -a

(C) i - c, ii - a, iii - d, iv - b

(D) i - a, ii - d, iii - c, iv - b

151. Symptoms like disappearance of subcutaneous fat, prominent ribs, dry skin and atrophy of digestive glands are seen in one year old infant. Identify the disease this child is suffering from

(A) Kwashiorkor (B) Marasmus

(C) Nephritis (D) Cretinism

152. The following forms of water EXCEPT _____ water is NOT available to plants for absorption.

(A) gravitational (B) capillary

(C) hygroscopic (D) combined

collegedunia

153. Identify the mRNA transcribed from the DNA having following nucleotide sequence.



(A)



(B)



(C)



(D)



154. Due to formation of oxyhaemoglobin, the pH of blood decreases due to release of H^+ion and the H_2CO_3 dissociates into H_2O and CO_2. This is called _____ .

(A) Hamburger's phenomenon
(B) Bohr effect
(C) Haldane effect
(D) Sewall Wright effect

155. Given below are two statements.
Statement I - Thickness of ozone is more above the poles than at the equator.
Statement II - The 'ozone holes' are generally found in Antarctic region.
In the light of above statements, select the correct option given below:

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

156. The famous wine of Goa, traditionally called 'fenny', is made by fermenting the fleshy pedicels of _____ fruits.

(A) Cashew
(B) Jack
(C) Fig
(D) Banana

157. Disorder caused due to accumulation of amyloid proteins in CNS is _____

(A) Alzheimer's disease
(B) Cushing's disease
(C) Parkinson's disease
(D) Addison's disease

158. In genetic engineering, the foreign DNA is also called _____ .

(A) vector DNA
(B) cDNA
(C) passenger DNA
(D) r-DNA

159. Excessive dosage of _____ causes extreme happiness, irritability and paranoia

(A) Cannabinoids
(B) Opioids
(C) Cocaine
(D) Lysergic acid

160. The blastocyst stage of development is reached by the end of _____ day.

(A) 5^{th}
(B) 6^{th}
(C) 7^{th}
(D) 8^{th}

161. Pongidae includes

(A) baboons, macaques, langur
(B) lemurs, tarsiers, spider monkeys
(C) squirrel monkey, Gibbons, semi arboreal apes
(D) gorilla, chimpanzee, orangutan

162. How many times dehydrogenation occurs during Krebs cycle?

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

163. Which of the following covering of testis originates from peritoneum?

(A) Tunica adventitia (B) Tunica albuginea

(C) Tunica vaginalis (D) Tunica vasculosa

164. In a dihybrid cross, 9 : 3 : 3 : 1 ratio, denotes that _____.

(A) it is a polygenic inheritance (B) alleles of two genes are linked to each other

(C) alleles of two genes are segregated independently (D) it is a case of multiple alleles

165. How does the Hb act as buffer?

(A) By forming $HbCO_2$ (B) By forming HHb

(C) By forming $NaHCO_3$ (D) By forming HbO_2

166. Which one of the following genetically engineered microorganisms, used for clearing oil spills in the sea, was given first biopatent?

(A) E. coli (B) Pseudomonas

(C) Agrobacterium (D) Bacillus

167. The current loss of biodiversity which is progressing at an alarming rate is estimated to be _____ to _____ times faster than prehuman times.

(A) 10 to 100 (B) 50 to 100

(C) 100 to 1000 (D) 1000 to 10000

168. Which of the following statements is INCORRECT regarding macula lutea?

(A) It has fovea centralis at its centre. (B) It has maximum density of cone cells.

(C) It is the area of retina from where optic nerve leaves the eyeball. (D) It is a place of formation of sharpest vision.

169. Spores of which one of the microbial biocontrol agents are used to get rid of butterfly?

(A) Beauveria bassiana (B) Entomophthora pallidaroseum

(C) Zoopthora radicans (D) Bacillus thuringiensis

170. In oliguria condition, urine output is less than _____.

(A) 400 ml /day (B) 800 ml /day

(C) 1000ml/ day (D) 1200 ml /day

171. Cerebrosides found in white matter of brain and myelin sheath contains

(A) glycerol only (B) glycerol and fatty acid only

(C) glycerol, fatty acids, and galactose only (D) glycerol, fatty acids, galactose and nitrogenous base

172. With respect to spermatogenesis, match Column I with Column II and select the correct option.

Column I		**Column II**	
i.	Phase of growth	a.	Spermatid
ii.	Spermiogenesis	b.	Primary Spermatocyte
iii.	Production of spermatogonia	c.	Meiosis
iv.	Phase maturation of	d.	Mitosis

(A) i-b, ii -c, iii -d, iv -a (B) i - b, ii - a, iii - d, iv - c

(C) i-a, ii-b, iii-c, iv-d (D) i - b, ii - c, iii - d, iv -a

173. Match concepts of origin of life in Column I with their examples given in Column II.

Column (I)		**Column (II)**	
i.	Geographical	a.	Moths of Great Britain in 1845
ii.	Convergent evolution	b.	Bones of forelimbs in man and whale
iii.	Divergent evolution	c.	Wings of butterfly and bird
iv.	Natural selection	d.	Darwin finches

Choose the correct option:

(A) i - b, ii - c, iii - d, iv - a (B) i - a, ii - b, iii - d, iv - c

(C) i - c, ii - b, iii -a, iv - d (D) i - d, ii - c, iii - b, iv -a

174. Which one of the following represents qualitative growth in plants?

(A) Increase in dry weight
(B) Increase in number of cells
(C) Differentiation of cells
(D) Increase in volume

175. The smallest WBC is _____.

(A) neutrophil
(B) basophil
(C) monocyte
(D) lymphocyte

176. Given below are two statements about absorption of water in plants.
Statement I - Rate of water absorption is maximum at soil temperature between 40 to 60°C.
Statement II - High concentration of solutes in soil water increases the rate of absorption of water.
In the light of above statements, select the correct option given below:

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

177. Select the mismatched pair

(A) Gastrin - stimulates secretion of gastric juice
(B) GIP - inhibits gastric secretion
(C) Secretin - inhibits glucagon and insulin secretion
(D) CCK - induces satiety

178. Given below are two statements.
Statement I - Glycolysis occurs in cytoplasm of the cell.
Statement II - Glycolysis is a common process in aerobic as well as anaerobic respiration.
In the light of above statements, select the correct option given below:

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

179. Given below are two statements.
Statement I - Directional selection favours intermediate forms and eliminates both phenotypic extremes.
Statement II - In directional selection, more individuals acquire value other than mean character value.
In the light of above statements, select the correct option given below:

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

180. Select the correct statements regarding sympathetic nervous system.
i. It consists of 31 pairs of sympathetic ganglia.
ii. It is also called cranio- sacral outflow.
iii. It controls body activities like fight and flight
iv. Pre-ganglionic fibres are long and post response. ganglionic fibres are short.
v. Adrenaline is produced towards terminal end of post-ganglionic fibres.

(A) i and ii
(B) iii and v
(C) v and iv
(D) ii and iv

181. The amount of _____ determines the pattern of ecological succession in the given area.

(A) soil
(B) water
(C) light
(D) minerals

182. If 10 ml of the blood sample of a healthy person, containing added anticoagulant, is subjected to centrifugation, then approximately how much will be the amount of plasma?

(A) 7 ml
(B) 5 to 5.5 ml
(C) 4 to 4.3 ml
(D) 3 ml

183. Interaction between flamingos visiting Mumbai west coast and resident fishes is of _____ type.

(A) mutualism
(B) competition
(C) amensalism
(D) predation

184. Following are the limitations of ecological pyramids EXCEPT _____ .

(A) it does not accommodate a food web.
(B) it shows relationship between the organism of trophic level.
(C) it assumes a simple food chain that never existed.
(D) saprophytes are not given any place.

185. Which one of the following hormones is a modified amino acid?

(A) Thyroxine
(B) Oxytocin
(C) Estrogen
(D) Parathormone

186. Minerals are absorbed by plants in the ionic form through _____ region of roots.

(A) root cap
(B) elongation
(C) meristematic
(D) maturation

187. Which of the following pairs of organisms are ureotelic?

(A) Sharks and rays.
(B) Aquatic reptiles and Osteichthyes.
(C) Adult amphibians and land snails.
(D) Birds and mammals.

188. The core DNA in the nucleosome is _____ base pairs long

(A) 126
(B) 146
(C) 176
(D) 200

189. Match the concepts given in Column I with their scientist who proposed them given in Column II.

Column (I)		**Column (II)**	
i.	Osmotic absorption	a.	Bohem
ii.	Non-osmotic absorption	b.	Dixon and Jolly
iii.	Capillarity theory	c.	Atkins and Priestley
iv.	Cohesion- tension theory	d.	Kramer and Thiman

Choose the correct option:

(A) i - c, ii - d, iii - a, iv - b
(B) i - c, ii - a, iii - b, iv - d
(C) i-a, ii-b, iii-d, iv-c
(D) i - d, ii - c, iii - a, iv - b

190. Darwin's finches are good example of _____

(A) connecting link
(B) adaptive radiation
(C) convergent evolution
(D) industrial melanism

191. If the sequence of gene loci on a chromosome are A-B-C-D-E-O-T. Which of the following gene pair will have least probability of being inherited together?

(A) C and D
(B) A and T
(C) A and B
(D) O and T

192. Given below are two statements.
Statement I - The pituitary gland is situated in sella turcica of palate bone.
Statement II - The pituitary gland is attached to the hypothalamus by a hypophyseal stalk.
In the light of above statements, select the correct option given below:

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

193. Which one of the following combination of bacterial strains used by Griffith, when injected to mice will NOT kill them?

(A) Heat killed ' R '+ Live ' S '
(B) Live ' R ' + Live ' S '
(C) Live 'S' + Heat killed 'S'
(D) Live ' R ' + Heat killed ' S '

194. Which one of the following is INCORRECT regarding 'resource partitioning'?

(A) It occurs when two species compete for same resources.
(B) Competition can be avoided by choosing different times for feeding.
(C) It promotes co-existence.
(D) It works on exclusion principle.

195. Which one of the following is NOT a traditional knowledge passed down through generations?

(A) Farming practices
(B) Conservation of biological diversity
(C) Biologically important medicines
(D) Use of genetically engineered microorganism for cleaning oil spills.

196. Match the Column I with Column II with reference to biomagnification of DDT.

Column (I) (Organism)		**Column (II) (DDT content)**	
i.	Small fishes	a.	0.04 ppm
ii.	Fish eating Birds of Prey	b.	0.5 ppm
iii.	Large fishes	c.	25 ppm
iv.	Zooplankton	d.	2.ppm

Choose the correct option:

(A) i-b, ii -d, iii -c, iv -a
(B) i-b, ii -c, iii -d, iv -a
(C) i-c, ii-b, iii-a, iv-d
(D) i-d, ii -b, iii - c, iv -a

197. Which one of the following plant hormones does NOT prevent abscission in plants?

(A) Auxin
(B) Gibberellin
(C) Cytokinin
(D) Ethylene

198. Match the Column I with Column II.

Column (I) (Parasite)		**Column (II) (Host)**	
i.	Ticks	a.	Marine fish
ii.	Copepods	b.	Dog
iii.	Cuscuta	c.	Indian crow
iv.	Asian Koel	d.	Hedge plants

Choose the correct option:

(A) i-b, ii-a, iii-c, iv-d
(B) i - b, ii - a, iii - d, iv - c
(C) i – b, ii – c, iii – d, iv – a
(D) i - b, ii - d, iii - c, iv -a

199. Identify P and Q regions in the diagram of histology of alimentary canal and identify the type of tissue.



(A) P - Submucosa - loose connective tissue Q - Circular muscle layer - Smooth muscles
(B) P -Mucosa- Mesothelium Q - Muscularis - Straited muscles
(C) P-Serosa- Squamous epithelium Q - Muscularis - Smooth muscles
(D) P -Mucosa- epithelium with microvilli Q - Longitudinal muscle layer - Striated muscles

200. Which one of the following is NOT a cyanobacterial biofertilizer?

(A) Anabaena
(B) Nostoc
(C) Oscillatoria
(D) Rhizobium

- End of Question Paper -