MHT CET 2026 PCB Apr 25 Shift 1 Question Paper

Conducted by the State Common Entrance Test Cell, Maharashtra

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

General Instructions

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

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

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

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

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

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

1. A vector $\vec{B}$ is along positive y-axis and its vector product with another vector $\vec{A}$ is zero; then vector $\vec{A}$ could be

(A) $5\hat{k}$ (B) $5\hat{i}$

(C) $5\hat{j}$ (D) $-5\hat{k}$

2. The least count of voltmeter is 0.2 V, and least count of ammeter is 1 mA. If the potential difference is 2 V, and the current is 10 mA, what is the percentage error in measurement of resistance?

(A) 2% (B) 20%

(C) 1% (D) 10%

3. A coin is thrown vertically upward in a lift which is ascending with acceleration a. The coin takes time t_1 to reach the maximum height h. In the later instant, the coin is dropped from the same height in a lift which is descending with acceleration a. The time taken by the coin to reach the floor of the lift is t_2, then

(A) $t_2 < t_1$ (B) $t_2 > t_1$

(C) $t_2 = t_1$ (D) $t_2/t_1 = 0$

4. A particle is whirled in a vertical circle of radius R. If its velocity at the lowest point is just enough to complete the circle ($u = \sqrt{5gR}$), then the magnitude of its total acceleration when the string becomes horizontal is (g is acceleration due to gravity).

(A) $3g$ (B) g

(C) $10g$ (D) $g\sqrt{10}$

5. Two billiard balls A and B, each of mass 50 g and moving in opposite directions at a speed of 5 m/s each, collide and rebound at a same speed. The magnitude of impulse imparted to each ball is

(A) 0.1 kg · m/s (B) 0.5 kg · m/s

(C) 0.125 kg · m/s (D) 0.25 kg · m/s

6. A solid, homogeneous sphere of mass M and radius R is rolling down a rough inclined plane inclined at an angle θ. Which of the following statements is INCORRECT?

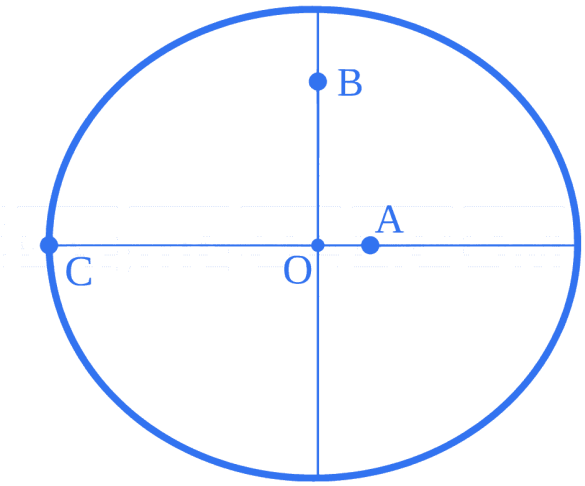
(A) Angular momentum is not conserved about the point of contact.

(B) The net torque acting on the sphere is $MgR\cos\theta$

(C) The total energy is conserved.

(D) The component of force on the sphere along the incline is $Mg\sin\theta - f = Ma$

7. The moment of inertia of a uniform circular disc rotating about an axis perpendicular to the plane of the disc and passing through points O, A, B and C are I_o, I_A, I_B and I_C respectively, then



(A) $I_o = I_A = I_B = I_C$ (B) $I_C < I_B < I_A < I_o$

(C) $I_o < I_A < I_B < I_C$ (D) $I_C > I_B < I_A < I_o$

8. The orbital velocity of an artificial satellite in a circular orbit just above Earth's surface is v. For a satellite at the altitude $\frac{3}{4}^{\text{th}}$ the Earth's radius, the orbital velocity is

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

(C) $\sqrt{\frac{2}{7}}v$ (D) $\frac{3}{\sqrt{7}}v$

9. A solid ball having a radius of 2 cm, has a terminal speed of 32 cm/s in a viscous liquid. The terminal speed of a solid ball of the same material, with radius of 0.5 cm in the same liquid under identical conditions is

(A) 4 cm/s (B) 8 cm/s

(C) 2 cm/s (D) 16 cm/s

10. The angle of contact made by the liquid drop with the solid surface is obtuse. Then, which of the following statement is correct?

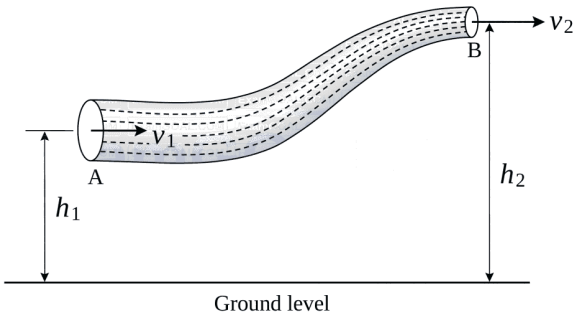
(A) A liquid drop will spread and form a thin film on solid surface.

(B) The liquid forms a strong bond with the solid surface due to molecular attraction.

(C) The liquid droplet will not wet the solid surface.

(D) The energy required to create a liquid-solid interface is low.

11. An ideal fluid flows in a non-uniform cross-sectional tube AB as shown in the figure. If A_1 and A_2 is the area of cross-section and E_1 and E_2 is the kinetic energy per unit volume of the fluid at A and B, respectively, then the ratio E_1/E_2 is



(A) $\frac{A_1^2}{A_2^2}$ (B) $\frac{A_2^2}{A_1^2}$

(C) $\frac{A_1}{A_2}$ (D) $\frac{A_2}{A_1}$

12. A resistance thermometer has resistance 95 Ω at the ice point and 140 Ω at the steam point. The resistance obtained if the actual temperature is 30°C is

(A) 117.5 Ω (B) 108.5 Ω

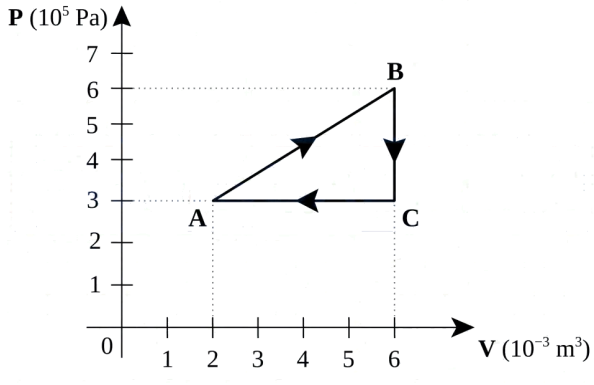
(C) 113.5 Ω (D) 13.5 Ω

13. A spherical blackbody of radius $R = 10$ m is maintained at a temperature T, radiating power P with a peak emission wavelength 5000 Å. If the body is compressed uniformly such that its radius becomes $R/2$, while its total radiated power is simultaneously increased to $16P$ by heating, what is the new wavelength λ'_m at which the peak emission occurs?

(A) $2500\sqrt{2}$ Å (B) $\frac{5000}{\sqrt{2}}$ Å

(C) $\frac{2500}{\sqrt{2}}$ Å (D) $\frac{2000}{\sqrt{2}}$ Å

14. A gas is taken through a cycle $A \to B \to C \to A$, as shown in the figure. The net work done by the gas is



(A) 600 J (B) 1200 J

(C) 1800 J (D) 400 J

15. Which of the following is NOT a correct equation for adiabatic process?

(A) $PV^{\gamma} = constant$

(B) $TV^{\gamma-1} = constant$

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

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

16. The temperature at which the root-mean-square speed of carbon dioxide molecules becomes just sufficient for escaping Earth's atmosphere is approximately
(Mass of carbon dioxide molecule $= 7 \times 10^{-26}$ kg, Boltzmann's constant $k_B = 14 \times 10^{-24}\ J/K$, escape velocity from Earth's surface $= 11$ km/s)

(A) 2.016×10^5 K (B) 4.032×10^5 K

(C) 5.016×10^5 K (D) 3.012×10^5 K

17. The internal energy per molecule for a diatomic (non-rigid) gas is (where k_B is Boltzmann's constant and T is absolute temperature).

(A) $\frac{3}{2}k_BT$ (B) $\frac{5}{2}k_BT$

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

18. A simple pendulum oscillating in air has a period of $\sqrt{3}$ second. If it is immersed in a non-viscous liquid, having density $\rho = \left(\frac{1}{x}\right)\sigma$, where σ is the density of the material of the bob, the new period is 2 second. The value of x is

(A) 6 (B) 4

(C) 2 (D) 1

19. The potential energy of a simple harmonic oscillator when the particle is at $\frac{3}{4}A$, is
(A is the amplitude of oscillation and E is the total energy of the oscillator)

(A) $\frac{9}{16}E$ (B) $\frac{3}{4}E$

(C) $\frac{1}{4}E$ (D) $\frac{1}{3}E$

20. Identify the equation that DOES NOT represent oscillatory motion.
(A is amplitude of motion)

(A) $y = A\sin\omega t + A\cos 2\omega t$

(B) $x = A\cos\left(\omega t - \frac{\pi}{4}\right)$

(C) $y = A\sin\omega t + A\cos(\omega t + \pi/2)$

(D) $y = A\sin\left(\omega t - \frac{\pi}{4}\right)$

21. The speed of the transverse wave on the stretched string under tension T_1 is v_1. If the tension in the string is increased by T_1, the speed of the transverse wave is v_2. If μ is the linear density of the string, then $v_2 = xv_1$. The value of x is

(A) $\sqrt{2}$ (B) 2

(C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$

22. Identify the CORRECT statement on beats
(A) The amplitude of beats is always constant.
(B) Beats are produced when two waves have the same frequency.
(C) Beat frequency is the average of the two source frequencies.
(D) Beats can be produced by the waves having slightly different frequencies and traveling in the opposite directions.

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

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

23. An organ pipe closed at one end produces 5^{th} overtone of an air column. It is found that air in the pipe is vibrating with x nodes and y antinodes. The value of x and y is

(A) $x = 5$ and $y = 6$ (B) $x = 6$ and $y = 6$

(C) $x = 6$ and $y = 5$ (D) $x = 5$ and $y = 5$

24. Two waves having same amplitude A, angular frequency ω and propagation constant k, traveling in opposite directions, have a phase difference of 60°. If they interfere with each other, the resultant displacement y of the wave is

(A) $2A\sin(\omega t + 30^\circ)\cos(kx + 30^\circ)$

(B) $A\sin(\omega t + 30^\circ)\cos(kx + 30^\circ)$

(C) $2A\sin(kt + 30^\circ)\cos(\omega x + 30^\circ)$

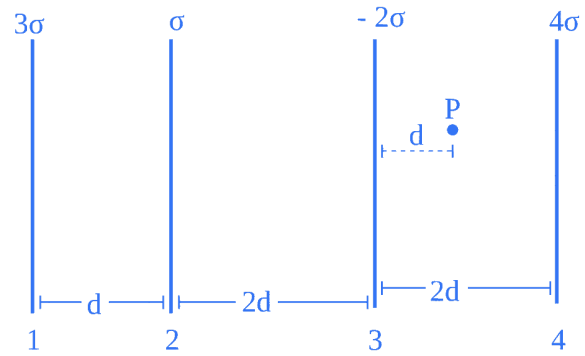
(D) $2A\sin(\omega t + kx + 60^\circ)$

25. A closed surface encloses n electric dipoles. The net electric flux through the closed surface is
(ϵ_0 = permittivity of free space, q = charge)

(A) $\frac{nq}{\epsilon_0}$ (B) $n\epsilon_0 q$

(C) $\frac{q}{\epsilon_0}$ (D) 0

26. Four infinitely large planar charged sheets are placed parallel to each other as shown in Figure 1. Find the magnitude of electric field at point P.



(A) $\frac{\sigma}{\epsilon_0}$ (B) $\frac{2\sigma}{\epsilon_0}$

(C) $\frac{\sigma}{2\epsilon_0}$ (D) $\frac{3\sigma}{\epsilon_0}$

27. The electric field at a point in a certain region of free space due to a charge Q is 0. The electric potential at that point is

(A) constant. (B) zero.

(C) infinite. (D) directly proportional to the charge Q.

28. An unknown resistance wire in the left gap of a meter bridge balances a $10\,\Omega$ resistance in the right gap at a point that divides the bridge wire in a ratio $3:2$. If the length of this unknown resistance wire is 1.5 m, what is its resistance per unit length? (Bridge wire is uniform)

(A) $10.0\,\Omega/\text{m}$ (B) $6.67\,\Omega/\text{m}$

(C) $15.0\,\Omega/\text{m}$ (D) $1.5\,\Omega/\text{m}$

29. When a galvanometer is shunted with a $2\,\Omega$ resistance, the deflection is reduced to one-fourth. If the galvanometer is further shunted with a $1\,\Omega$ resistance, the further reduction in deflection is a fraction x of the deflection observed when shunted with $2\,\Omega$. Find x, assuming the main current I remains the same.

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

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

30. For a circular coil of radius a, at what distance x along its axis the magnetic field is exactly $\frac{1}{27}$ of its value at the center?

(A) $\sqrt{2}a$ (B) $2\sqrt{2}a$

(C) $2a$ (D) $\frac{1}{\sqrt{2}}a$

31. A proton moves at a constant speed v along the x-axis through a crossed electric and magnetic field. The magnetic field is $\vec{B} = B_0\hat{k}$ T. The electric field $\vec{E}$ in V/m is

(A) $-vB_0\hat{j}$ (B) $vB_0\hat{j}$

(C) $vB_0\hat{k}$ (D) $vB_0\hat{i}$

32. In an experiment, the interior of a first current-carrying toroid with 1000 turns per unit length is filled with aluminum (susceptibility 2.4×10^{-5}). A second, identical toroid with 500 turns per unit length is filled with magnesium (susceptibility 1.2×10^{-5}). If both toroids carry the same current I, the ratio of the increase in their magnetic fields is

(A) $2:1$ (B) $4:1$

(C) $1:4$ (D) $1:2$

33. A square loop (side a) rotates in a uniform magnetic field B perpendicular to the rotation axis. What is the maximum induced EMF (e_{max}) and the first angle θ (between magnetic field B and the loop normal) where it occurs?

(A) $Ba^2\omega;\ \theta = 90^\circ$ (B) $Ba^2\omega^2;\ \theta = 0^\circ$

(C) $\frac{1}{2}Ba^2\omega;\ \theta = 270^\circ$ (D) $Ba\omega;\ \theta = 180^\circ$

34. Two identical inductors are connected in parallel. If the parallel combination stores 40 J of magnetic field energy when a total current of 2 A is passed through it, the value of the self-inductance of each coil is

(A) 20 H (B) 60 H

(C) 40 H (D) 10 H

35. Two conducting circular loops of radii R_1 and R_2 are placed in same plane with their centers coinciding. If $R_1 > R_2$ and current I is flowing through the circular loop of radius R_1, then mutual inductance between them is proportional to

(A) $\frac{R_2^2}{R_1}$ (B) $\frac{R_2}{R_1}$

(C) $\frac{R_1^2}{R_2}$ (D) $\frac{R_1}{R_2}$

36. The ratio of power factor of purely resistive circuit to purely reactive circuit is
($\cos 0^\circ = 1$ and $\cos 90^\circ = 0$)

(A) infinite (B) $1:1$

(C) $1:2$ (D) 0

37. Consider the statements on capacitive reactance.
Statement I: As capacitance increases, the capacitive reactance also increases.
Statement II: The capacitive reactance is independent of the source frequency.

(A) Statements I and II are incorrect. (B) Statement I is correct; Statement II is incorrect.

(C) Statements I and II are correct. (D) Statement I is incorrect; Statement II is correct.

38. An alternating current is given by $i = i_1 \sin\omega t - i_2 \cos\omega t$. The rms current is given by

(A) $\frac{i_1+i_2}{\sqrt{2}}$ (B) $\frac{\sqrt{i_1^2+i_2^2}}{2}$

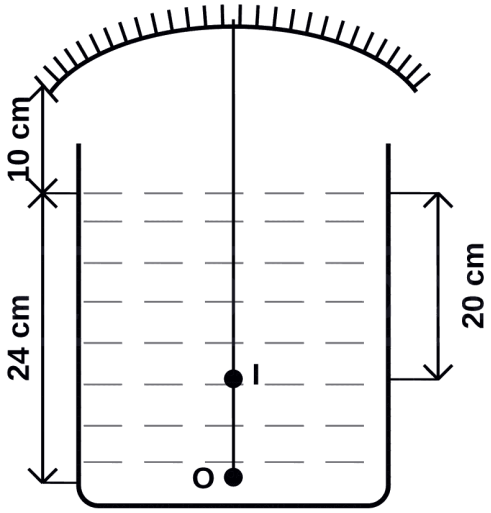
(C) $\sqrt{\frac{i_1^2+i_2^2}{2}}$ (D) $\sqrt{i_1^2+i_2^2}$

39. A parallel-plate capacitor of $50\,\mu$F contains a dielectric slab of constant (k) with the same dimensions. If a time-varying potential difference is applied at a rate of 50 V/s. What is the displacement current in the capacitor?

(A) 5 mA (B) 2.5 mA

(C) 3 mA (D) 1.5 mA

40. A container is filled with water ($\mu = 4/3$) up to a height of 24 cm. A concave mirror is placed 10 cm above the water level, and the image (I) of an object placed at the bottom is formed 20 cm below the water level, as shown in Figure. The focal length of the mirror is nearly



(A) $-13.2\ cm$ (B) $13.2\ cm$

(C) $-15.5\ cm$ (D) $15.5\ cm$

41. In a single-slit Fraunhofer diffraction experiment, the first minimum is observed at an angle of 30° for light of wavelength λ. If the same slit is now illuminated by light of the same wavelength, the angular position (θ) of the first secondary maximum is
($\sin 30^\circ = \frac{1}{2}$).

(A) $\sin^{-1}(1/2)$ (B) $\sin^{-1}(1/4)$

(C) $\sin^{-1}(3/4)$ (D) $\sin^{-1}(1/3)$

42. The Brewster's angle θ_B for air-glass interface should be such that
(refractive index of glass $= \frac{3}{2}$)

(A) $\theta_B = 90^\circ$ (B) $45^\circ < \theta_B < 90^\circ$

(C) $30^\circ < \theta_B < 45^\circ$ (D) $0^\circ < \theta_B < 45^\circ$

43. For Young's double slit experiment, two statements are given below.
Statement I: In the interference pattern, energy is not destroyed at the dark fringes; it is simply redistributed to the bright fringes.
Statement II: Fringe width (X) increases with the increase in frequency of light.

(A) Statement I is false but statement II is true.

(B) Statement I is false and statement II is false.

(C) Statement I is true and statement II is true.

(D) Statement I is true but statement II is false.

44. A student plots two different graphs using the same photoelectric experiment data.
1. Maximum kinetic energy (K_{max}) against frequency (ν)
2. Stopping potential (V_o) against frequency (ν)
Let the slope of graph 1 be S_1 and the slope of graph 2 be S_2.
What is the relationship between the slopes?
(h = Planck's constant, e = charge on electron)

(A) $\frac{S_1}{S_2} = h$ (B) $S_1 \cdot S_2 = h$

(C) $\frac{S_1}{S_2} = e$ (D) $S_1 + S_2 = e$

45. An electron and positron are accelerated from rest to the same kinetic energy. The ratio of their de Broglie wavelengths is

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

(C) 1 : 4 (D) 1 : 1

46. The ratio of ionization energy of a hydrogen atom in fifth excited state to second excited state is

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

(C) 4 : 1 (D) 1 : 4

47. The activity of a freshly prepared radioactive sample of a radioisotope is 10^{10} disintegrations per second. The average life (τ) of this isotope is 10^9 s, and the mass of a single atom of this isotope is 10^{-25} kg. The total mass of the radioactive sample is

(A) 0.1 mg (B) 1 mg

(C) 10 mg (D) 100 mg

48. Which of the following is true for a p-type semiconductor?

(A) The impurity level lies just above the valence band.

(B) The impurity level is just below the conduction band.

(C) The impurity level is near the conduction band.

(D) The majority carriers are electrons.

49. If the current gain in common-base configuration (α) of a transistor increases from 0.95 to 0.96, the percentage change in current gain in common-emitter configuration (β) is approximately

(A) 1%

(B) 10%

(C) 26%

(D) 50%

50. A full-wave rectifier provides a DC output voltage of 20 V. If the root mean square (RMS) value of the unwanted AC component is measured as 2 V, the ripple factor in percentage is

(A) 2%

(B) 5%

(C) 10%

(D) 20%

51. Calculate the number of atoms in 52 moles of argon.

(A) 218.8×10^{23} (B) 545.1×10^{23}

(C) 313.1×10^{23} (D) 136.3×10^{23}

52. Which of the following elements has an electronic configuration, $[Ar]\ 4s^2$?

(A) Na (B) Mg

(C) K (D) Ca

53. Calculate the energy associated with an electron in the first orbit of hydrogen atom?

(A) -2.18×10^{-18} J (B) 52.9 J

(C) -1.09×10^{-18} J (D) 2.18×10^{-18} J

54. Which of the following properties increases from fluorine to iodine in group?

(A) Electronegativity (B) Volatility

(C) Ionic radius (D) Oxidizing power

55. Which of the following bonds is expected to be the most polar?

(A) C–H (B) C–C

(C) C–O (D) C–N

56. Identify a pair of molecules having zero dipole moment.

(A) BF_3 and HBr (B) CH_4 and NF_3

(C) NH_3 and H_2O (D) CCl_4 and CO_2

57. Calculate the pressure in atm of 48 g oxygen gas in a 2 dm^3 container at 27 °C.
$[R = 0.0821\ atm\ dm^3\ K^{-1}\ mol^{-1}]$

(A) 18.47 atm (B) 12.32 atm

(C) 6.16 atm (D) 24.63 atm

58. What would be the heat released in kJ when 450 cm^3 of 0.02 M H_2SO_4 is mixed with 650 cm^3 of 0.1M NaOH? (Heat of neutralization of H_2SO_4 and NaOH is -114 kJ/mol of H_2SO_4)

(A) 0.065 (B) 3.71

(C) 1.026 (D) 1.80

59. A certain organic solvent has $\Delta H_{vap} = 28.50\ kJ\ mol^{-1}$ and $\Delta S_{vap} = 88.2\ J\ K^{-1}\ mol^{-1}$ at 1 bar. Calculate its normal boiling point (where $\Delta G = 0$).

(A) 298.5 K (B) 323.1 K

(C) 355.0 K (D) 372.8 K

60. Which of the following is NOT an intensive property?

(A) Pressure (B) Temperature

(C) Volume (D) Molar volume

61. Calculate the dissociation constant of a weak monobasic acid if it is 0.04% dissociated in a 0.01M solution.

(A) 2.4×10^{-9} (B) 1.2×10^{-9}

(C) 2.0×10^{-9} (D) 1.6×10^{-9}

62. The hydrogen ion concentration of the ocean is about 2×10^{-9} M. What is the pOH of ocean?

(A) 8.85 (B) 5.3

(C) 7.85 (D) 8.7

63. Which of the following buffer solutions is used for precipitation of cations of the III A group?

(A) HF + NaF in water.

(B) HCOOH + HCOONa in water

(C) $NH_4OH + NH_4Cl$ in water.

(D) $CH_3COOH + CH_3COONa$ in water.

64. In a reaction,
$2H_2S + SO_2 \rightarrow 2H_2O + 3S$
Identify the substance oxidized.

(A) H_2S (B) SO_2

(C) H (D) both H_2S and SO_2

65. What is the IUPAC name of $(CH_3)_2CH\text{-}COOH$?

(A) Butanoic acid (B) 3-Methylpropanoic acid

(C) 2-Methylpropanoic acid (D) Propanoic acid

66. Chlorination of alkane is a photochemical process. It is initiated by the process of

(A) heterolysis
(B) homolysis
(C) pyrolysis
(D) hydrolysis

67. Which of the following is one of the 12 principles of Green Chemistry?

(A) Use of non-renewable resources
(B) Maximization of waste production
(C) Use of catalysts to enhance reaction efficiency
(D) Preferring hazardous solvents

68. An element has bcc structure with atomic radius 200 pm. Find the volume of unit cell.

(A) 5.625×10^{-23} cm^3
(B) 7.513×10^{-23} cm^3
(C) 8.41×10^{-23} cm^3
(D) 9.848×10^{-23} cm^3

69. The unit cell of metal contains four particles. Calculate the volume of the unit cell if the molar mass of metal is 192 g mol^{-1}.
$[\rho \times N_A = 1.5 \times 10^{25}$ g cm^{-3}mol$^{-1}]$

(A) 5.12×10^{-23} cm^3
(B) 4.21×10^{-23} cm^3
(C) 7.15×10^{-23} cm^3
(D) 2.56×10^{-23} cm^3

70. Which of the following formulae is used to find total volume of atoms present in face-centred cubic unit cell?

(A) $\frac{20}{3}\pi r^3$
(B) $\frac{24}{3}\pi r^3$
(C) $\frac{12}{3}\pi r^3$
(D) $\frac{16}{3}\pi r^3$

71. A solution contains 50 g of common salt in 500 gm of water. Find the concentration of the solution in terms of percentage.

(A) 500%
(B) 50%
(C) 9%
(D) 100%

72. A solution containing 1.2 g nonvolatile solute in 100 g. of a solvent has a boiling point elevation 1.2 K. Calculate the molar mass of solute if molal elevation constant of solvent is 6.5 K kg mol^{-1}.

(A) 60 g mol^{-1}
(B) 65 g mol^{-1}
(C) 70 g mol^{-1}
(D) 75 g mol^{-1}

73. Identify the correct statements for ideal solution.
(A) It obeys Raoult's law over the entire range of concentration.
(B) It shows a positive deviation from Raoult's law.
(C) In an ideal solution, solvent-solute, solute-solute and solvent-solvent molecular interactions are comparable.
(D) The volume change i.e. $\Delta_{mix}V = 0$
(E) The enthalpy change i.e. $\Delta_{mix}H = 0$
Choose the **correct** answer from the options given below:

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

74. Which of the following acts as a cathode in a dry cell?

(A) Zn + NH_4Cl
(B) Zn
(C) Graphite rod
(D) $NH_4Cl + ZnCl_2$

75. Calculate the time required in second to deposit 5.85 g Ni from $NiCl_2$ solution by passing 10 A current (molar mass of Ni = 58.5 g mol^{-1})

(A) 19.3
(B) 193
(C) 1930
(D) 19300

76. Which of the following is a primary cell?

(A) Lead storage battery
(B) Dry cell
(C) Fuel cell
(D) Ni--Cd cell

77. The rate constant for the reaction is 6.93×10^{-2} minute^{-1}. Determine the concentration that will remain after 20 minutes if the initial concentration of the reactant is 1 M.

(A) 0.25 M
(B) 0.125 M
(C) 0.5 M
(D) 0.065 M

78. A first order reaction takes 90 minutes for 75% decomposition. Calculate its rate constants.

(A) 0.032 min^{-1}
(B) 0.015 min^{-1}
(C) 0.039 min^{-1}
(D) 0.045 min^{-1}

79. The slope of the graph $[A]_t$ against time for zero order reaction is

(A) $-k$
(B) k
(C) $k/2.303$
(D) $-k/2.303$

80. Identify from the following the phenomenon that occurs when charcoal is added to methylene blue solution and shaken, it becomes colourless after some time.

(A) Desorption (B) Sorption
(C) Adsorption (D) Absorption

81. The order of oxidizing power among the halogens is:

(A) $F_2 > Cl_2 > Br_2 > I_2$
(B) $I_2 > Br_2 > Cl_2 > F_2$
(C) $Cl_2 > F_2 > Br_2 > I_2$
(D) $Br_2 > I_2 > Cl_2 > F_2$

82. Find the number of unpaired electrons in Nd^{+3}. (atomic number = 60)

(A) 5 (B) 7
(C) 3 (D) 1

83. Identify the series of elements so that all the elements in it are radioactive in nature.

(A) Lanthanide (B) Actinoids
(C) p block elements (D) Transition elements

84. Which of the following complexes exhibits solvate isomerism?

(A) $[Co(NH_3)_6]\ [Cr(CN)_6]$ and $[Cr(NH_3)_6]\ [Co(CN)_6]$
(B) $[Cr(H_2O)_6]Cl_3$ and $[Cr(H_2O)_5Cl]Cl_2 \cdot H_2O$
(C) $[Co(NH_3)_5Br]SO_4$ and $[Co(NH_3)_5\ SO_4]Br$
(D) $[Co(NH_3)_5(NO_2)]^{2+}$ and $[Co(NH_3)_5(ONO)]^{2+}$

85. Identify the geometry of a complex compound $[CoF_6]^{-3}$.

(A) Square planar (B) Tetrahedral
(C) Octahedral (D) Trigonal pyramidal

86. Which of the following is not an allylic halide?

(A) 4-bromopent-2-ene (B) 3-bromo-2-methylbut-1-ene
(C) 1-bromobut-2-ene (D) 4-bromobut-1-ene

87. Vapours of alcohol are passed over hot copper to give ketone. Ketone reacts with ethylene glycol to give a cyclic ketal. Cyclic ketal by treating with aq. HCl forms acetone. Identify the alcohol.

(A) Butan-1-ol (B) Butan-2-ol
(C) Propan-1-ol (D) Propan-2-ol

88. Identify the product formed when ethyl alcohol reacts with H_2SO_4 at 443 K.

(A) Ethoxy ethane (B) Ethene
(C) Dimethyl ether (D) Ethyl hydrogen sulphate

89. Which of the following reagents is used to distinguish ethers from hydrocarbons?

(A) NaOH (B) $KMnO_4$
(C) Cold dilute H_2SO_4 (D) Cold concentrated H_2SO_4

90. Identify the product obtained when phenol reacts with bromine in presence of CS_2

(A) P-Bromophenol (B) Mixture of O-Bromophenol and P-Bromophenol
(C) 2, 4, 6-tribromophenol (D) m-Bromophenol

91. Identify Lucas reagent from following.

(A) conc. HCl + anhydrous $AlCl_3$ (B) conc. HCl + anhydrous $ZnCl_2$
(C) conc. HCl + dil. H_2SO_4 (D) conc. HCl + conc. H_2SO_4

92. Which of the following statements regarding the haloform test is NOT correct?

(A) Ethanol exhibits this test. (B) It is given by acetaldehyde.
(C) It is given by compounds containing methyl ketone group. (D) It is given by benzaldehyde.

93. Which of the following is less basic than aniline?

(A) p-nitroaniline (B) NH_3
(C) CH_3NH_2 (D) N-methyl aniline

94. Identify glycosidic linkage present in maltose.

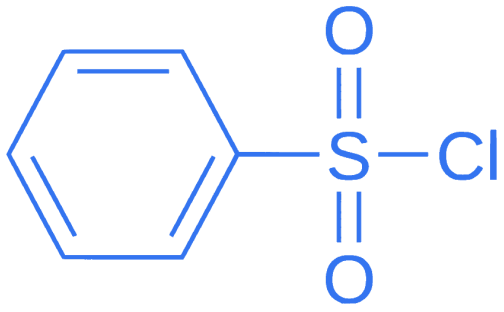
(A) α-1, 2 (B) β-2, 1
(C) β-1, 3 (D) α-1,4

95. What is the number of stereo structure of glucose?

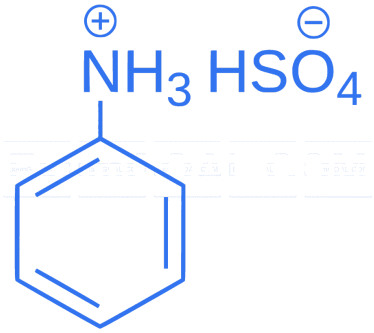
(A) 8 (B) 16
(C) 32 (D) 64

collegedunia

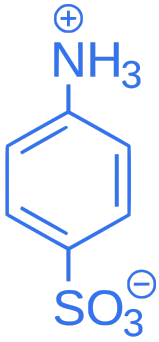
96. Which of the following is Zwitter ion of sulphanilic acid?



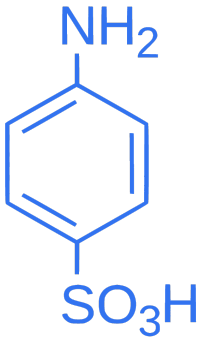
(A)



(B)



(C)



(D)

97. Identify the monomer of natural rubber.

(A) Butene
(B) Isobutylene
(C) Propene
(D) Isoprene

98. What type of fiber is silk?

(A) Semisynthetic
(B) Synthetic
(C) Animal
(D) Vegetable

99. What is the correct chemical name of an insecticide DDT?

(A) Dichlorodiphenyltrichloroethane
(B) Dichloro Diphenyl Trichloroethene
(C) Dichloro Diphenyl Trichlorobenzene
(D) Diphenyl Dichloro Toluene

100. Clove is recommended for toothaches because

(A) Curcumin present in it possesses antiseptic properties.
(B) Eugenol, present in it, exhibits analgesic and antimicrobial properties.
(C) Methyl salicylate present in it possesses analgesic properties.
(D) The gallic acid present in it exhibits antimicrobial and antioxidant properties.

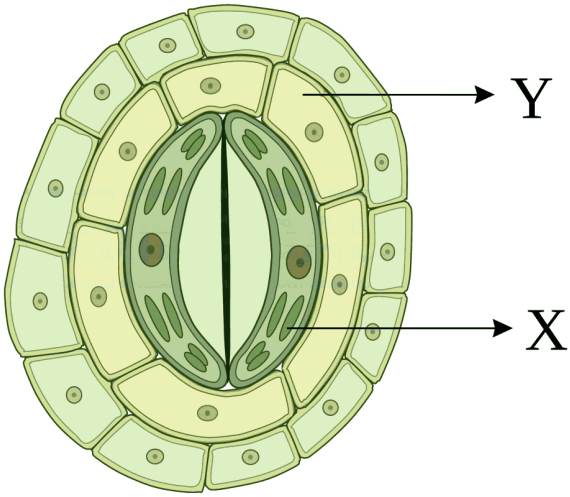
101. Which one of the following belongs to old world monkeys?

(A) Gibbon
(B) Langur
(C) Squirrel monkey
(D) Gorilla

102. During germination of seed, water and oxygen enter the seed through _____ .

(A) hilum
(B) micropyle
(C) seed coat
(D) funicle

103. Identify the labels 'X' and 'Y' in following figure.



(A) X - Epidermal cell, Y - Guard cell
(B) X - Guard cell, Y - Epidermal cell
(C) X - Subsidiary cell, Y - Guard cell
(D) X - Guard cell, Y - Subsidiary cell

104. Which one of the following is NOT a component of eukaryotic chromosome?

(A) DNA
(B) RNA
(C) Histone protein
(D) Non-histone protein

105. Water acts as thermal buffer due to

(A) high specific heat only.
(B) low heat of vaporization only.
(C) high heat of fusion only.
(D) high specific heat, high heat of vaporization and high heat of fusion.

106. Various properties of water are due to _____ between water molecules.

(A) hydrogen bonds
(B) peptide bonds
(C) glycosidic bonds
(D) disulphide bonds

107. Given below are the two statements.
Statements - I: According to international code of enzyme nomenclature, the first part in the name of an enzyme indicates the nature of substrate upon which the enzyme acts.
Statements-II: Second part in the name of an enzyme indicates the reaction catalysed by it.
In the light of above mentioned statements, choose the correct 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.

108. Friedrich Miescher isolated nucleic acid from _____ .

(A) white blood cells
(B) red blood cells
(C) *Streptococcus pneumoniae*
(D) bacteriophages

109. A disaccharide is formed when two monosaccharides react by _____ reaction.

(A) polymerization
(B) hydrogenation
(C) condensation
(D) isomerisation

110. How much of water is passively absorbed by the plant?

(A) 10%
(B) 50%
(C) 85%
(D) 98%

111. Given below are two statements:
Statement I: Water always flows from a cell having less negative potential to cell having more negative potential.
Statement II: Difference between water potential of adjacent cells decides the movement of water through plasmodesmata across the cells in plants.
In the light of above statements choose the most appropriate answer from the options given below

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

112. α-Ketoglutarate is precursor of -

(A) glutamic acid
(B) aspartic acid
(C) fatty acid
(D) glycerol

113. Match elements given in Column I with their functions given in Column II.

Column I	Column II
A. Phosphorus	I. Essential for oxygen evolution in photosynthesis.
B. Nitrogen	II. Activation of certain enzymes.
C. Copper	III. Essential for phosphorylation reactions and constituent of certain proteins and all nucleic acids.
D. Chloride	IV. Constituent of proteins, vitamins, hormones, ATP and chlorophyll

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

114. Light plays important role for the plants to perform _____ for their survival as well as others on earth.

(A) reproduction
(B) metabolism
(C) respiration
(D) photosynthesis

115. The process in which food is oxidized and ATP is generated is called _____ .

(A) breathing
(B) cellular respiration
(C) external respiration
(D) internal respiration

116. R.Q. is ratio of volume of

(A) CO_2 released to O_2 released
(B) O_2 consumed to CO_2 released
(C) O_2 released to O_2 consumed
(D) CO_2 released to O_2 consumed

117. How many ATP molecules are produced through ETS, out of 38 molecules produced after complete oxidation of one glucose molecule?

(A) 4
(B) 8
(C) 32
(D) 34

118. The movement of protons during ATP synthesis in mitochondria takes place from outer chamber into inner chamber by F_0 part of oxysome present in the

(A) outer mitochondrial membrane.
(B) inner mitochondrial membrane.
(C) outer mitochondrial chamber.
(D) inter-membrane space.

119. Glycolysis ends in formation of _____ .

(A) pyruvic acid
(B) lactic acid
(C) acetaldehyde
(D) ethanol

120. Application of which plant hormone overcomes the requirement of vernalization?

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

121. Which hormone stimulates formation of lateral and adventitious roots?

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

122. The rate of three phases of growth in plants can be explained by _____ graph.

(A) straight line
(B) sigmoid
(C) J-shaped
(D) rectangular hyperbola

123. Which of the following statements are CORRECT about phytochromes?
A. Phytochrome pigment exists in two forms.
B. Two forms of phytochrome are interconvertible.
C. *Pfr* form of phytochrome inhibits flowering in SDP during day time.
D. *Pfr* form of phytochrome inhibits flowering in LDP during day time
E. During day time *Pr* is accumulated in plants.

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

124. Protein digesting enzyme pepsin is secreted in the _____ digestive system.

(A) oesophagus
(B) stomach
(C) ileum
(D) duodenum

125. Increased consumption of dietary fibres, increased fluid intake and performing some exercises help solving the problem of _____ .

(A) jaundice
(B) vomiting
(C) constipation
(D) marasmus

126. The bacteria found in large intestine of a man produce vitamins _____.
(A) C
(B) D
(C) E
(D) K
(E) B

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

127. Which one of the following brings about curdling of milk in an infant?

(A) Rennin
(B) Amylase
(C) Pepsin
(D) Trypsin

128. With reference to absorption in human digestive system, select the CORRECT statements from the following-
A. Carrier ions like Na^+ bring about facilitated transport.
B. All ions are absorbed against concentration gradient only.
C. Facilitated transport requires energy.
D. Water is absorbed by facilitated transport.
E. Fructose is absorbed by facilitated transport.

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

129. Select the INCORRECT statement about liver.

(A) Kupffer cells help in detoxification process.
(B) Blood proteins such as fibrinogen and prothrombin are not produced in liver.
(C) Deamination of ammonia takes place to form urea.
(D) It stores excess of glucose in the form of glycogen.

130. The volume of air present in respiratory tract from nose upto terminal bronchioles and which is not involved in gaseous exchange is -

(A) tidal volume
(B) vital capacity
(C) residual volume
(D) dead space

131. Match the parts of respiratory system given in column I with their respective functions in column II and choose the correct option given below.

Column I	**Column II**
A. Mesethmoid cartilage	I. separates thoracic and abdominal cavities
B. 'C' shaped incomplete cartilaginous rings	II. divides nasal cavity into right and left chambers
C. Epiglottis	III. prevents entry of food into trachea
D. Diaphragm	IV. prevents collapsing of trachea

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

132. In adult human being, the condition in which pulse rate is above 100 beats per minute, is called ___ .

(A) anorexia
(B) polycythemia
(C) tachycardia
(D) bradycardia

133. Diameter of arterioles and capillaries decreases under the effect of (A) and causes increase in (B).

(A) A - vasopressin, B - blood pressure
(B) A - heparin, B - blood coagulation
(C) A - histamine, B - phagocytosis
(D) A - acetylcholine, B - blood pressure

134. Which one of the following group of arteries are located superficially in human body?

(A) Pulmonary artery, carotid artery, coronary artery.
(B) Radial artery, brachial artery, carotid artery
(C) Coronary artery, aortic arch, brachial artery.
(D) Subclavian artery, radial artery, femoral artery.

135. Catabolism of haemoglobin produces _____ and _____ .

(A) urochrome, urea
(B) bilirubin, uric acid
(C) amino acids, bilirubin
(D) urochrome, bilirubin

136. Internal bleeding (hemorrhage) can be caused by condition called -

(A) polycythemia
(B) erythropoiesis
(C) thrombocytopenia
(D) leucopenia

137. Which of the following statements are CORRECT with respect to cardiac activity?
A. Nervous control of cardiac activity is brought about by Autonomous nervous system (ANS).
B. ANS receives inputs from proprio-receptors, chemoreceptors and baroreceptors for nervous control of heart beat.
C. Cardiac activity increases with elevated blood levels of K^+ and Na^+.
D. Conditions like hypoxia, acidosis cause increase in cardiac activity.

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

138. About _____ of cardiac output is supplied to the kidneys for osmoregulation and excretion.

(A) $\frac{1}{5}$ th
(B) $\frac{1}{6}$ th
(C) $\frac{1}{4}$ th
(D) $\frac{1}{8}$ th

139. Haemodialysis is advised immediately when renal function falls below _____ %.

(A) $5 - 7$
(B) $8 - 9$
(C) $10 - 12$
(D) $15 - 20$

140. Activity of osmoreceptors decreases when blood becomes _____ .

(A) acidic
(B) alkaline
(C) hyperosmotic
(D) hypo-osmotic

141. Select the correct match.

(A) Bowman's capsule - Urinary pole
(B) Ascending limb of loop of Henle - Thin walled.
(C) Collecting ducts - Renal cortex
(D) Podocytes - Filtration slits

142. Natriuresis is stimulated by _____ .

(A) Aldosterone
(B) ADH
(C) renin
(D) ANP

143. Synaptic vesicles of pre synaptic neurons release neurotransmitter in synaptic cleft due to _____

(A) opening of Ca^{++} channels due to change in voltage.
(B) K^+ ions which diffuse out of the axon.
(C) Na^+ which diffuses into the neuron.
(D) Na^+- K^+ pumps become operational.

144. Match the property of nerve fibre in column I with the explanation in column II

Column I (Property of nerve fiber)	**Column II (Explanation)**
A. Irritability	I. Time interval during which a nerve fails to respond to a second stimulus.
B. Refractory period	II. Ability to perceive stimulus and enter into a state of activity.
C. Conductivity	III. Many subliminal stimuli are given in quick succession to produce an impulse by addition.
D. Summation effect	IV. Ability to transmit the excitation.

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

145. Match the types of neuroglial cells in Column I with their functions in column II

Column I	Column II
A. Oligodendrocyte	I. Production of CSF
B. Astrocyte	II. Formation of white matter of CNS
C. Ependymal cells	III. Produce myelin sheath around the nerves of PNS
D. Schwann cells	IV. Maintenance of blood brain barrier.

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

146. Outermost thick, vascular and fibrous meninx is _____ .

(A) dura mater (B) pia mater
(C) arachnoid mater (D) grey matter

147. Select INCORRECT statement about dendrons.

(A) Dendrons are many small conical processes. (B) Nissl's granules and neurofibrils are present.
(C) Transmit impulses towards cyton. (D) They give out lateral branches called collaterals.

148. The type of neuroglia cell which is derived from monocyte and mediates immune response in CNS is

(A) microglia cell (B) astrocyte
(C) satellite cell (D) Schwann cell

149. Adrenaline hormone is released from

(A) adrenal medulla and sympathetic nerve fibres. (B) adrenal cortex and para sympathetic nerve fibres.
(C) thyroid gland and hypothalamus. (D) thymus gland and pineal gland.

150. The gland which gradually gets atrophied in adults is

(A) adrenal gland (B) pineal gland
(C) thymus gland (D) thyroid gland

151. Various hormones secreted by hypothalamus reach the pituitary gland through -

(A) hypophyseal portal system (B) hepatic portal vein
(C) superior vena cava (D) inferior vena cava

152. Repeated nuclear division without formation of cell wall and appearance of large central vacuole pushing the newly formed nuclei towards the periphery is observed in _____ endosperm.

(A) cellular (B) nuclear
(C) mosaic (D) helobial

153. Angiosperms depend on external agents for pollination because _____ .

(A) pollen grains are non-motile. (B) pollen grains are motile.
(C) male gametes are motile. (D) female gametes are motile.

154. Given below are two statements.
Statement I - Inner sporogenous cell is formed from archesporial cell by mitotic division.
Statement II - Outer parietal cell formed from archesporial cell undergoes mitotic divisions to form anther wall layers.
In the light of above statements, select the correct 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.

155. Dioecy in some plants can prevent _____ .

(A) allogamy (B) xenogamy
(C) hybridization (D) autogamy

156. Heteroanthy is always associated with _____.

(A) dichogamy (B) heterostyly
(C) herkogamy (D) unisexuality

157. Finger-like processes present on proximal funnel like part of the oviduct are _____ .

(A) microvilli (B) fimbriae
(C) cilia (D) pedicels

158. Select the correct sequence with respect to the process of spermatogenesis.
a) Primary spermatocyte
b) Primordial cell
c) Secondary spermatocyte
d) Spermatogonia
e) Spermatids

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

159. How many spermatozoa will be formed from 100 primary spermatocytes?

(A) 200 (B) 400
(C) 600 (D) 800

160. Match phases of menstruation in column I with events occurring during respective phase in column II and select the correct option.

Column I	Column II
A. Menstrual phase	I. rupturing of mature Graafian follicle
B. Follicular phase	II. increase in level of progesterone
C. Ovulatory phase	III. decrease in level of estrogen and progesterone
D. Luteal phase	IV. development of Graafian follicle

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

161. Trophoblast cells in contact with the embryonal knob are called _____ .

(A) amniogenic cells (B) cells of Rauber
(C) syncytiotrophoblast (D) embryoblast

162. Identify the INCORRECT match

(A) LNG - 20 → Hormone releasing IUD (B) Multiload 375 → Copper releasing IUD
(C) Lippes loop → Plastic double 's' loop (D) Diaphragm → Made of rubber to cover penis

163. With respect to a specific genus and its species, a monohybrid cross is a cross between_____.

(A) two pure parents differing in single pair of contrasting characters. (B) any two parents differing in single pair of contrasting characters.
(C) two pure parents differing in single pair of similar characters. (D) a parent and its offspring showing the same genotypes.

164. Which one of the following does NOT show non-allelic interaction?

(A) Pleiotropy (B) Co-dominance
(C) Polygenes (D) Complementary genes

165. Match types of variation in column I with their causes in column II. Select the correct option.

Column I	Column II
A. Gene mutation	I. occurs due to crossing over
B. Gene recombination	II. caused due to natural disasters
C. Gene flow	III. sudden permanent heritable change
D. Genetic drift	IV. migration of organisms

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

166. Linkage of genes in plants was discovered by _____ .

(A) Gregor Mendel (B) T. H. Morgan
(C) Bateson and Punnett (D) Sutton and Boveri

167. A man, homozygous dominant for widows peak (WW), marries a woman with straight hair-line homozygous recessive (ww). How many of their off springs will inherit straight hair line?

(A) 100 % (B) 50 %
(C) 25 % (D) 0 %

168. In their experiment to prove DNA replication is semi-conservative, Meselson and Stahl used 6M CsCl because the density gradient value of 6M CsCl is _____ the density gradient value of ^{15}N DNA.

(A) almost equal to
(B) double
(C) half
(D) one fourth to

169. Wobble hypothesis explains which one of the following properties of genetic code?

(A) Genetic code is universal.
(B) Genetic code is non-ambiguous.
(C) Genetic code is commaless.
(D) Degeneracy of genetic code.

170. The two strands in a DNA molecule are _____ .

(A) parallel and complementary.
(B) antiparallel and complementary.
(C) parallel and non-complementary.
(D) anti parallel and non-complementary.

171. During replication of DNA, formation of new strand takes place _____.

(A) in $5' \rightarrow 3'$ direction on the leading template while in $3' \rightarrow 5'$ direction on the lagging template.
(B) in $5' \rightarrow 3'$ direction on the both the templates.
(C) in $3' \rightarrow 5'$ direction on the both the templates.
(D) in $3' \rightarrow 5'$ direction on the leading template while $5' \rightarrow 3'$ direction on the lagging template.

172. In *Homo sapiens*, the estimated gene number is _____.

(A) $33,000$
(B) $25,000$
(C) $19,000$
(D) $68,000$

173. Which one of the following is NOT a vestigial organ in Human being?

(A) Nictitating membrane
(B) Pre-molars
(C) Vermiform appendix
(D) Coccyx

174. Connecting link between Ape and Man is _____.

(A) *Dryopithecus*
(B) *Ramapithecus*
(C) *Australopithecus*
(D) *Homo habilis*

175. Following is a list of evidence to support Darwinism, EXCEPT_____.

(A) evolution of present day long necked Giraffe
(B) existence of neutral flowers and sterility of hybrids
(C) development of DDT resistant mosquitoes
(D) evolution of black coloured moth as new species

176. Match the column - I with column - II and select the correct

Column I (Disease)	**Column II (Vector)**
A. Malaria	(I) male *Anopheles* mosquito.
B. Dengue	(II) female *Anopheles* mosquito
C. Filariasis	(III) female *Aedes* mosquito
	(IV) female *Culex* mosquito

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

177. In severe case of which of the following disease, surgical removal of gall bladder is done?

(A) Pneumonia
(B) Typhoid
(C) Filariasis
(D) Ascariasis

178. The _____ are also called as cytotoxic T-cell.

(A) killer T cells
(B) suppressor T cells
(C) memory T cells
(D) helper T cells

179. Which one of the following is NOT obtained from *Cannabis sativa*?

(A) Hashish
(B) Charas
(C) Ganja
(D) Heroin

180. Convulsions, anaemia, hepatomegaly etc. are the symptoms of _____.

(A) malaria
(B) pneumonia
(C) typhoid
(D) common cold

181. Given below are two statements:
Statement I - The term SCP denotes dead and dried cells of bacteria only.
Statement II - The fruiting bodies of mushrooms and truffles are sugar-free, fat-free but rich in proteins, vitamins, minerals and amino acids.
In the light of 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.

182. The biofertilizer _____ supplies nitrogen and antibiotics into the soil.

(A) *Azotobacter*
(B) *Anabaena*
(C) *Azospirillum*
(D) *Rhizobium*

183. Some of the alcoholic beverages are wine, beer, whisky, rum and brandy. How many of these are produced without distillation?

(A) Two
(B) Three
(C) Four
(D) All Five

184. The correct sequence of steps in Bio-gas production is _____.

(A) Hydrolysis → Acidogenesis → Methanogenesis
(B) Acidogenesis → Hydrolysis → Methanogenesis
(C) Solubilization → Methanogenesis → Acidogenesis
(D) Methanogenesis → Acidogenesis → Hydrolysis

185. Restriction enzymes are

(A) used for artificial DNA synthesis.
(B) used for sealing the DNA fragments in r DNA technology.
(C) synthesized by bacteria as a part of their defence mechanism.
(D) present in eukaryotic cell for degradation of DNA during infection.

186. The source of restriction endonuclease Alu I is _____ .

(A) *Agrobacterium tumefaciens*
(B) *Arthrobacter luteus*
(C) *Escherichia coli*
(D) *Bacillus thuringiensis*

187. Beginning with 20 fragments of DNA, after 10 cycles of PCR, how many copies of DNA will be produced?

(A) 20×10^2
(B) 20×2^{20}
(C) 20×2^{10}
(D) $20 \times 10^{10+1}$

188. Which one of the following pair of microbes shows significant role in genetic engineering experiments?

(A) *Gibberella fujikuroi* and *Rhizobium*
(B) *Escherichia coli* and *Agrobacterium tumefaciens*
(C) *Pneumococcus* and *Nitrosomonas*
(D) *Nitrobacter* and *Methanococcus*

189. The bacterial gene *Cys E* and *Cys M* introduced in sheep are responsible for _____ .

(A) increase of casein in milk.
(B) resistance to viral and coccidial diseases.
(C) xenotransplantation.
(D) increasing formation of keratin protein.

190. Conformers are those organisms _____ .

(A) whose body temperature and osmotic concentration remains constant.
(B) whose body temperature and osmotic concentration changes with that of surrounding.
(C) who move away from stressful condition.
(D) who can suspend their activities.

191. Absolute natality is _____ .

(A) number of births under ideal conditions.
(B) total number of births in a particular time.
(C) number of births when environmental pressures come into play.
(D) age related natality.

192. In accordance to their life styles _____ have evolved characters like loss of unnecessary sense organs, suckers, loss of digestive system and high reproductive capacity.

(A) endoparasites
(B) ectoparasites
(C) hosts
(D) brood parasites

193. The saprotrophs are most essential in _____ food chain.

(A) aquatic
(B) semiaquatic
(C) detritus
(D) aerial

194. The individual transitional communities during ecological succession are called _____ communities.

(A) primary
(B) pioneer
(C) climax
(D) seral

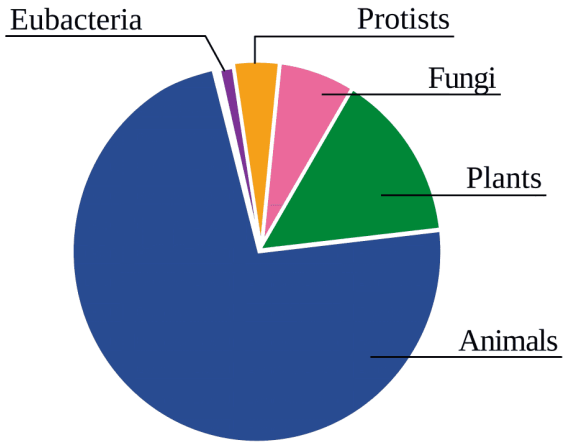
195. Which of the following are functional units of an ecosystem?
A. Productivity.
B. Spatial pattern.
C. Nutrient cycling.
D. Energy flow.
E. Decomposition.

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

196. Given below are two statements regarding ecological succession.
Statement I: There is a change in the diversity of species of organisms.
Statement II: There is an increase in the number of species and organisms.
based on the above statements choose the correct option.

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

197. Based on the given pie chart identify the INCORRECT statement.



(A) Diversity of eubacteria is the least.
(B) Animal diversity is the highest.
(C) Plant species diversity is equal to animal species diversity.
(D) Fungal diversity is more than protists diversity.

198. Tropical rain forest cover has reduced from _____ to _____ over the years due to 'evil quartet'.

(A) 20%, 16%
(B) 16%, 14%
(C) 14%, 10%
(D) 14%, 6%

199. Given below are two statements
Statement I - Ecosystem diversity is very low in India while it is quite high in Norway.
Statement II - The western ghats in India show great ecosystem diversity while regions like Ladakh and Rann of Kutch do not show variance like western ghats.
In the light of 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.

200. Which one of the following is NOT an example of invasive species?

(A) Carrot grass (B) Water hyacinth

(C) *Lantana* (D) *Rauwolfia vomitoria*

- End of Question Paper -