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FINAL TEST SERIES for NEET-2023

MM : 720

Test-9

Time : 3 Hrs. 20 Mins.

Mock Test for NEET (Complete Syllabus of Class XI & XII)

Instructions for Paper (ΣXVIIIIVT9β) :

- There are two sections in each subject, i.e. Section-A & Section-B. You have to attempt all 35 questions from Section-A & only 10 questions from Section-B out of 15.
- Each question carries 4 marks. For every wrong response 1 mark shall be deducted from the total score. Unanswered / unattempted questions will be given no marks.
- Use blue/black ballpoint pen only to darken the appropriate circle.
- Mark should be dark and completely fill the circle.
- Dark only one circle for each entry.
- Dark the circle in the space provided only.
- Rough work must not be done on the Answer sheet and do not use white-fluid or any other rubbing material on the Answer sheet. (ΣXVIIIIVT9β)

PHYSICS

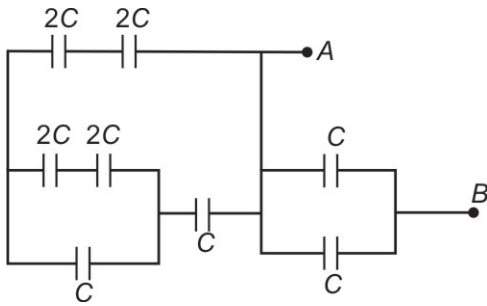
Choose the correct answer :

SECTION - A

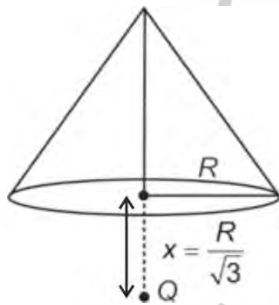
- Which of the following sets cannot enter into the list of fundamental quantities in any system of units?
 - Length, time, velocity
 - Length, mass, velocity
 - Mass, time, velocity
 - Length, time, mass
- If $Z = \frac{A^3 B^{1/3}}{C D^{3/2}}$ and percentage error in the measurement of A , B , C and D are 1%, 3%, 2% and 4% respectively, then relative error in the calculation of Z will be
 - 10×10^{-1}
 - 12×10^{-3}
 - 1.2×10^{-1}
 - 10^{-3}
- In ground to ground projectile, a particle is projected at an angle θ with the vertical such that its horizontal range R is related to its time of flight T as $R = 6 T^2$. If $g = 10 \text{ m/s}^2$ then value of $\tan \theta$ is
 - $\sqrt{3}$
 - $\frac{3}{4}$
 - 4
 - $\frac{6}{5}$
- The magnetic field strength at the centre of a circular coil carrying current I is given by (N is number of turns in coil and R is the radius of the coil.)

(1) $\frac{\mu_0 N I}{2R}$	(2) $\frac{\mu_0 N I}{R}$
(3) $\frac{2\mu_0 N I}{R}$	(4) $\frac{\sqrt{2} \mu_0 N I}{R}$

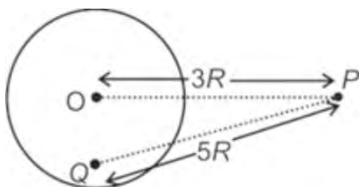
5. Equivalent capacitance between points A and B as shown in the following circuit will be



- (1) C
 (2) 2C
 (3) 3C
 (4) 4C
6. A charged particle 'Q' is placed outside a solid metallic cone on the axis of a cone at a distance 'x' from the centre of its base as shown in figure. Electric flux linked with the cone due to the charge is



- (1) Zero
 (2) $\frac{Q}{2\epsilon_0}$
 (3) $\frac{Q}{4\epsilon_0}$
 (4) $\frac{Q}{\epsilon_0}$
7. A point charge 'Q' is placed off centre inside a thin conducting shell of radius 'R' as shown in the figure. $\left[K = \frac{1}{4\pi\epsilon_0} \right]$



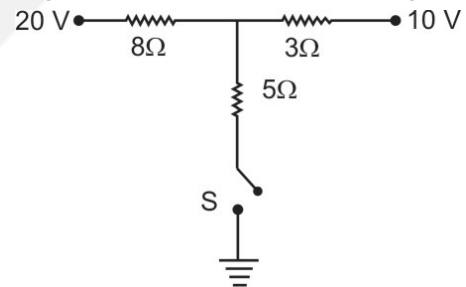
Electric field at point 'P' in this situation will be

- (1) $\frac{KQ}{25R^2}$ (2) $\frac{KQ}{9R^2}$
 (3) $\frac{KQ}{9R^2 + 25R^2}$ (4) None of these

8. Pure Si at 500 K has equal number of electron (n_e) and hole (n_h) concentration of $1.7 \times 10^{15} \text{ m}^{-3}$. On doping with boron hole concentration n_h increases to $4.7 \times 10^{21} \text{ m}^{-3}$. The doped semiconductor is of
- (1) N-type with electron concentration $n_e = 3.5 \times 10^{12} \text{ m}^{-3}$
 (2) P-type with electron concentration $n_e = 6.14 \times 10^8 \text{ m}^{-3}$
 (3) N-type with electron concentration $n_e = 8.2 \times 10^9 \text{ m}^{-3}$
 (4) P-type with electron concentration $n_e = 2.89 \times 10^{30} \text{ m}^{-3}$
9. A particle is executing a simple harmonic motion. Its maximum acceleration and maximum velocity are 'P' and 'Q' respectively. Then time period of oscillation will be

- (1) $\frac{2\pi Q^2}{P}$ (2) $\frac{Q}{2\pi P}$
 (3) $\frac{Q^2 2\pi}{P^2}$ (4) $\frac{2\pi Q}{P}$

10. Current passed through the switch 'S' after closing it in the circuit shown in the figure is



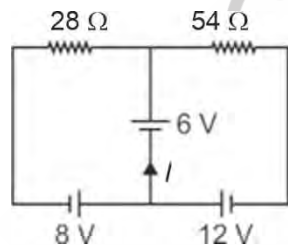
- (1) 1.77 A (2) 3.23 A
 (3) 5.3 A (4) Zero

11. An electromagnetic wave of wavelength λ is incident on a photosensitive surface of negligible work function. If the photoelectrons emitted from the surface have the de-Broglie wavelength λ_0 then λ is equal to

- (1) $\lambda_0 \sqrt{\frac{2mc}{h}}$ (2) $\left(\frac{2mc}{h}\right) \lambda_0^2$
 (3) $\sqrt{\frac{h}{2mc}} \lambda_0$ (4) $\left(\frac{2mc}{h}\right)^2 \lambda_0$

12. A uniform chain of length 4 m is kept on a table such that 120 cm hangs freely from the edge of the table. The total mass of chain is 8 kg. The work done in pulling the entire chain on the table slowly is
- (1) 9.6 J
 - (2) 3.6 J
 - (3) 7.2 J
 - (4) 14.4 J
13. A honey bee is flying along a straight line (x -axis) according to the equation $x = \alpha + \beta t^2$, where $\alpha = 5$ cm and $\beta = 8$ cm/s². Its acceleration when velocity of honey bee is 18 m/s, is
- (1) 8 cm/s²
 - (2) 16 cm/s²
 - (3) 4 cm/s²
 - (4) Zero

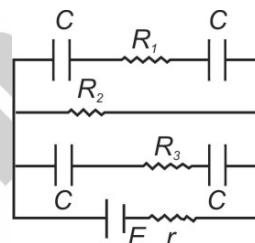
14. Consider the circuit shown in the figure. The current I is equal to



- (1) $\frac{6}{5}$ A
 - (2) -3 A
 - (3) 3 A
 - (4) $\frac{5}{6}$ A
15. A convex lens of glass ($\mu = 1.5$) having focal length $f = 15$ cm is dipped completely in water. Focal length of convex lens in water becomes
- $$\left(\mu_{\text{water}} = \frac{4}{3} \right)$$
- (1) 60 cm
 - (2) 15 cm
 - (3) -60 cm
 - (4) 30 cm
16. If the earth is supposed to be a sphere of radius R , and g' is the value of acceleration due to gravity at latitude of 30° and g at the pole, then the value of $g - g'$ will be

- (1) $\frac{\omega^2 R}{4}$
- (2) $\frac{3\omega^2 R}{4}$
- (3) $\omega^2 R$
- (4) $\frac{\omega^2 R}{3}$

17. Two carnot engine A and B have their sources at 1000 K and 1100 K and their sinks are at temperatures 400 K and 500 K respectively. If η_A and η_B are their efficiencies, then
- (1) $\eta_A > \eta_B$
 - (2) $\eta_A < \eta_B$
 - (3) $\eta_A = \eta_B$
 - (4) Insufficient data
18. In an ideal transformer, number of turns in primary coil are 140 and that in the secondary coil are 280. If current in the primary coil is 7 A, then that in the secondary coil is
- (1) 14 A
 - (2) 3.5 A
 - (3) 7 A
 - (4) 4 A
19. In figure $E = 5$ V, $r = 1$ Ω , $R_1 = 1$ Ω and $R_3 = R_2 = 4$ Ω while $C = 3$ μ F. If charge on each capacitor are Q_1, Q_2, Q_3 and Q_4 , at steady state then value of $Q_1 + Q_2 + Q_3 + Q_4$ will be

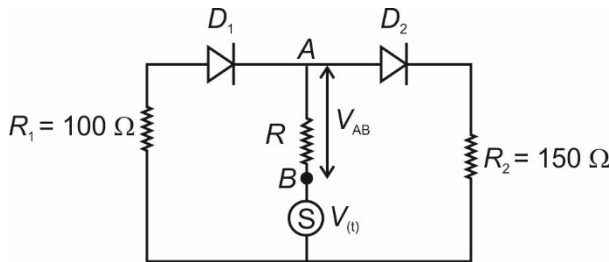


- (1) 6 μ C
 - (2) 30 μ C
 - (3) 48 μ C
 - (4) 24 μ C
20. The binding energy of deuteron (${}_1\text{H}^2$) is 1.15 MeV per nucleon and an alpha particle (${}_2\text{He}^4$) has a binding energy of 7.1 MeV per nucleon. Energy released in the following reaction will be ${}_1\text{H}^2 + {}_1\text{H}^2 \longrightarrow {}_2\text{He}^4 + Q$
- (1) 5.95 MeV
 - (2) 26.1 MeV
 - (3) 23.8 MeV
 - (4) 28.9 MeV
21. Which of the following waves have the maximum wavelength?
- (1) x-rays
 - (2) Radio waves
 - (3) Ultraviolet waves
 - (4) Visible rays
22. Two coherent light waves of intensities I and $4I$ superpose at a point with phase difference of $\frac{\pi}{2}$. The resultant intensity of the superposed wave at that point will be
- (1) $5I$
 - (2) $7I$
 - (3) $6I$
 - (4) $8I$

23. A sample of radioactive element has a mass of 20 g initially. The approximate mass of this element in the sample after two mean lives will be (take $e^2 = 7.38$)

- (1) 5 g (2) 12.0 g
(3) 6.8 g (4) 2.7 g

24. In the circuit given below, $V(t)$ is the sinusoidal voltage source, voltage drop $V_{AB}(t)$ across the resistance R is



- (1) Is half wave rectified
(2) Is not full wave rectified
(3) Has the same peak values in the positive and negative half cycles
(4) Has the different peak values in the positive and negative half cycles

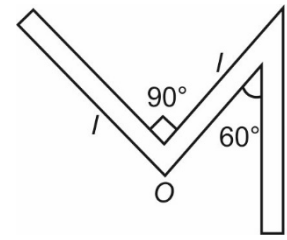
25. Four particles A, B, C and D are situated at the corners of a square of side d . They start moving with same speed v along the sides of square in same sense. Then their relative velocity of approach after $t = \frac{d}{2v}$ is

- (1) $\frac{v}{\sqrt{2}}$ (2) $\sqrt{2}v$
(3) $\frac{v}{2}$ (4) 0

26. A solid cylinder of radius R is kept at rest on a smooth horizontal surface. A horizontal force is applied to move the cylinder under pure rolling. Then height of force from horizontal surface is

- (1) R (2) $\frac{R}{2}$
(3) $\frac{3R}{2}$ (4) $2R$

27. A thin rod of length $3l$ and mass $3m$ is bent as shown in figure. Then moment of inertia of the given structure about an axis passing through point O and perpendicular to the plane containing rod is

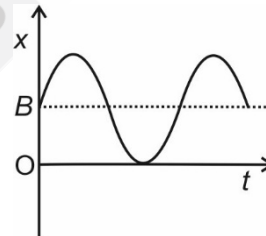


- (1) $\frac{ml^2}{3}$ (2) ml^2
(3) $\frac{17}{12}ml^2$ (4) $\frac{3}{2}ml^2$

28. The accuracy in the measurement of length 50 cm of a simple pendulum is 1 mm. If time period of 2 s is determined by measuring the time of 50 oscillations using a watch of resolution 0.2 s. The percentage error in the determined value of g is

- (1) 0.2%
(2) 0.3%
(3) 0.6%
(4) 0.4%

29. For a particle executing S.H.M with amplitude A , the position varies with time according to the following graph. The corresponding position equation with time is given by

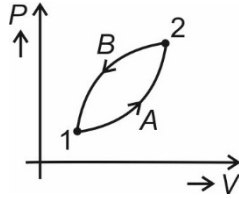


- (1) $x = A \sin \omega t$
(2) $x = A + B \sin \omega t$
(3) $x = B + A \cos \omega t$
(4) $x = B + A \sin \omega t$

30. A gas is contained in a vessel of volume V_0 at a pressure P_0 . If the gas is to be pumped out by a suction pump of stroke volume V then number of moles of gas remained in the vessel after two strokes is (where, R is gas constant, T is constant temperature of gas)

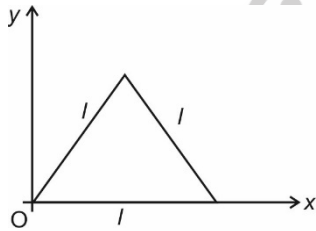
- (1) $\frac{P_0 V_0^3}{RT(V_0 + V)^2}$ (2) $\frac{P_0 V_0^2}{RT(V_0 + V)^2}$
(3) $\frac{P_0 V_0^3}{RT(V_0 + V)^3}$ (4) $\frac{P_0 V_0^2}{RT(V_0 + V)^3}$

31. In the given figure if ΔU_1 and ΔU_2 be the change in internal energy in processes A and B respectively then



- (1) $\Delta U_1 + \Delta U_2 = 0$
- (2) Net heat will be rejected by the system in process A + B
- (3) Total work done by the system is positive in the process A + B
- (4) Both (1) and (2)

32. A conducting triangular frame is placed in x – y plane as shown in figure. If magnetic field B is varying w.r.t position x as $B = 2x^2$ tesla, then emf induced (in volts) in the loop is



- (1) $\sqrt{3}I^3$
- (2) $\frac{\sqrt{3}}{2}I^2$
- (3) $\sqrt{3}I^2$
- (4) Zero

33. A hydrogen like atom of atomic number z is in an excited state of quantum number 2n. It can emit a photon of maximum energy 204 eV. If it makes a transition in quantum state n, a photon of energy 40.8 eV is emitted the value of n will be

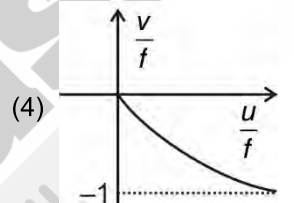
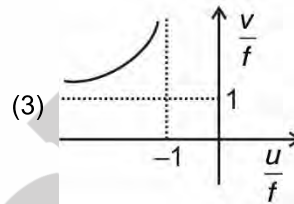
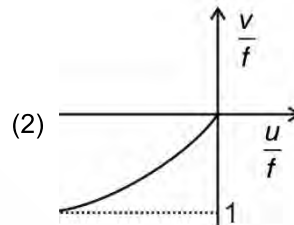
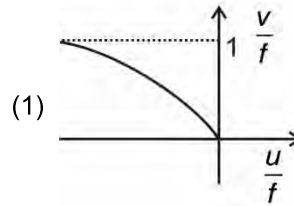
- (1) 1
- (2) 2
- (3) 3
- (4) 4

34. In a magnetic field $\vec{B} = \hat{i} + y\hat{j} + 3\hat{k}$, a charged particle (q, m) is moving with velocity $\vec{v} = 2\hat{i} + 3\hat{j} + z\hat{k}$ experiences a force $\vec{F} = -\hat{i} + 2\hat{j} - \hat{k}$. Value of y and z are

- (1) y = 4, z = 2
- (2) y = 2, z = 4
- (3) y = 3, z = 6
- (4) y = 6, z = 6

35. A virtual erect image in a convex mirror is best represented by

(u, v and f are co-ordinates)

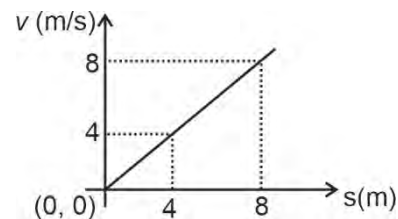


SECTION - B

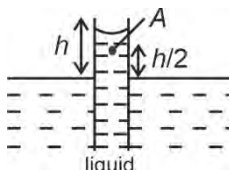
36. A ray of light is moving along the direction of vector $\hat{i} + 2\hat{j} + 3\hat{k}$. Then the angle made by the direction of light with the y-axis is

- (1) $\cos^{-1}\left(\frac{1}{\sqrt{14}}\right)$
- (2) $\sin^{-1}\left(\frac{2}{\sqrt{14}}\right)$
- (3) $\cos^{-1}\left(\frac{2}{\sqrt{14}}\right)$
- (4) $\sin^{-1}\left(\frac{3}{\sqrt{14}}\right)$

37. Velocity-position graph of a particle is as shown in the figure. The acceleration of the particle when its velocity is 6 m/s is



- (1) 6 m/s²
- (2) 8 m/s²
- (3) 12 m/s²
- (4) 24 m/s²

38. A ball is projected at an angle of 53° with horizontal at a speed of 20 m/s on a planet named 'Einsteinium'. A horizontal wind starts blowing which gives a retardation to the ball in horizontal direction. It was found that ball travels in a straight line. Taking acceleration due to gravity on the planet to be 4 m/s^2 , the magnitude of acceleration imparted by the wind is given by $\alpha \text{ m/s}^2$. Find α
- (1) 2 (2) 3
(3) 5 (4) 4
39. A iron nail is dropped from a height h on the level of a sand bed. If it penetrates through a distance x in the sand before coming to rest, the average force exerted by the sand on the nail is
- (1) $mg\left(\frac{h}{x}+1\right)$ (2) $mg\left(\frac{x}{h}+1\right)$
(3) $mg\left(\frac{h}{x}-1\right)$ (4) $mg\left(\frac{x}{h}-1\right)$
40. Raindrops fall with constant speed during the later stages of their descent because
- (1) All drops fall from the same height
(2) The gravitational force is negligible for objects as small as raindrops
(3) The gravitational force cannot increase the speed of a falling object to more than 9.8 m/s
(4) Air resistance balances the gravitational force on a drop
41. 10 gm of ice at 0°C is mixed with ' m ' gm of water at 50°C . The minimum value of m so that ice melts completely is ($L_f = 80 \text{ cal/gm}$) and $s_w = 1 \text{ cal/gm}^\circ\text{C}$
- (1) 32 gm
(2) 20 gm
(3) 40 gm
(4) 16 gm
42. Four particle are in $x - y$ plane at
- (P) 1 kg at (0, 0)
(Q) 2 kg at (1, 0)
(R) 3 kg at (1, 2)
(S) 4 kg at (2, 0)
- The centre of mass is located at
- (1) (0.3, 1.2) (2) (1.3, 0.6)
(3) (0.5, 1.4) (4) (1.2, 0.3)
43. In the diagram shown the liquid has density ρ . Atmospheric pressure is P_0 . The pressure at point A is
- 
- (1) $P_0 + \frac{\rho gh}{2}$ (2) $P_0 - \frac{\rho gh}{2}$
(3) $\frac{\rho gh}{2}$ (4) None of these
44. When a paramagnetic substance is placed in a magnetic field, the magnetic induction inside the substance.
- (1) Remains constant (2) Decreases
(3) Increases (4) Reduces to zero
45. A magnet of magnetic moment M is cut into two equal halves. The two parts are placed perpendicular to each other so that their north poles touch each other. The resultant magnetic moment is
- (1) $\sqrt{2}M$ (2) $\frac{M}{\sqrt{2}}$
(3) $\sqrt{3}M$ (4) $\frac{M}{\sqrt{3}}$
46. The respective speeds of five molecules are 2, 1.5, 1.6, 1.6 and 1.2 km/s. The most probable speed in km/s will be
- (1) 2 (2) 1.58
(3) 1.6 (4) 1.31
47. If two waves represented by $y_1 = 4\sin\omega t$ & $y_2 = 3\cos\omega t$ interfere at a point, then the amplitude of the resulting wave is
- (1) 4 unit
(2) 1 unit
(3) 5 unit
(4) $\frac{4}{3}$ unit
48. An inductance of 2 H and a resistance of 10 ohm are connected in series to a battery of 5 V. The initial rate of change of current is
- (1) 2.5 A/s (2) 2.0 A/s
(3) 0.5 A/s (4) 0.25 A/s

49. When no power is drawn in the secondary coil of an ideal transformer, the power factor of the primary coil of an ideal transformer is
- (1) One (2) Zero
(3) $\frac{1}{2}$ (4) ∞
50. A series resonant LCR circuit has a quality factor (Q-factor) 0.4 and a band width of 1.3 kHz. If $R = 2 \text{ k}\Omega$, $C = 0.1 \text{ }\mu\text{F}$, then the value of inductance is
- (1) 0.1 H (2) 0.064 H
(3) 2 H (4) 5 H

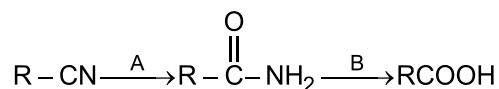
CHEMISTRY

SECTION - A

51. Mischmetal alloy mainly consists of
- (1) Alkaline earth metals
(2) Transition metals
(3) Lanthanoids metals
(4) Actinoids metals
52. Match list-I with list-II and identify the correct option.

	List-I (Metal)		List-II (Common method of extraction)
a.	Al	(i)	Reduction of the oxide with CO and coke in blast furnace
b.	Fe	(ii)	Electrolysis of Al_2O_3 dissolved in molten Na_3AlF_6
c.	Cu	(iii)	Roasting followed by reduction with coke
d.	Zn	(iv)	Roasting of sulphide partially and reduction

- (1) a(i), b(ii), c(iii), d(iv) (2) a(iv), b(iii), c(ii), d(i)
(3) a(i), b(ii), c(iv), d(iii) (4) a(ii), b(i), c(iv), d(iii)
53. A and B in the following reaction sequence respectively are



- (1) $\text{H}^+/\text{H}_2\text{O}$, H^+/Δ
(2) H^+/Δ , Br_2/OH^-
(3) LiAlH_4 , H^+/Δ
(4) H^+/Δ , LiAlH_4

54. Given below are two statements:

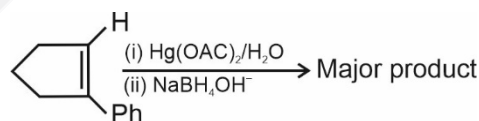
Statement I : The particles in nucleus of the cell, responsible for heredity, are called chromosomes which are made up of proteins and nucleic acids.

Statement II : The sugar moiety in DNA molecules is β -D-2-deoxyribose.

In the light of above statements select the correct option.

- (1) Both statement I and statement II are correct
(2) Both statement I and statement II are incorrect
(3) Statement I is correct but statement II is incorrect
(4) Statement I is incorrect but statement II is correct
55. The colour of concentrated solution of sodium in liquid ammonia is
- (1) Red (2) Blue
(3) Bronze (4) Yellow

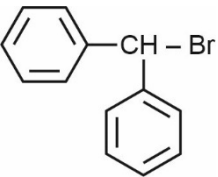
56. Major product in the given reaction is



- (1) (2)
(3) (4)

57. The change in the optical rotation of freshly prepared solution of glucose is known as

- (1) Tautomerism
(2) Racemisation
(3) Mutarotation
(4) Epimerisation

58. I. $\text{CH}_2 = \text{CH} - \text{Br}$
 II. $\text{CH}_2 = \text{CH} - \text{CH}_2 - \text{Br}$
 III. 
 IV. $\text{CH}_3 - \text{CH}_2 - \text{CH}_2 - \text{Br}$
 Correct order of $\text{S}_{\text{N}}1$ reactivity of above compounds is
 (1) (III) > (II) > (IV) > (I) (2) (II) > (III) > (IV) > (I)
 (3) (I) > (II) > (III) > (IV) (4) (III) > (IV) > (II) > (I)
59. The synthesis of alkyl fluorides is best accomplished by
 (1) Sandmeyer's reaction
 (2) Swarts reaction
 (3) Wurtz reaction
 (4) Finkelstein reaction
60. An organic compound A on heating with NH_3 gives B. B in presence of KOH reacts with Br_2 to give Ph-NH_2 . Compound A is
 (1) $\text{Ph} - \text{OH}$
 (2) $\text{Ph} - \text{COOH}$
 (3) $\text{Ph} - \text{CH}_2 - \text{COOH}$
 (4) $\text{Ph} - \overset{\text{O}}{\parallel}{\text{C}} - \text{NH}_2$
61. Kolbe's electrolytic method can be used to produce
 (1) An alkane (2) An alkene
 (3) An alkyne (4) All of these
62. Both lithium and magnesium display several similar properties due to diagonal relationship, however, the one which is incorrect, is
 (1) Both form nitrides
 (2) Nitrates of both yield NO_2 and O_2 on thermal decomposition
 (3) Both give crimson red colour to the flame test
 (4) Both do not form solid hydrogen carbonates
63. Number of electrons present in 100 g of D_2O is
 (1) $10 N_{\text{A}}$
 (2) $100 N_{\text{A}}$
 (3) $50 N_{\text{A}}$
 (4) $20 N_{\text{A}}$
64. The ratio of orbital angular momentum of electrons having $l = 1$ and $l = 2$ respectively will be
 (1) 3 : 1
 (2) 1 : 3
 (3) $\sqrt{3} : 1$
 (4) $1 : \sqrt{3}$
65. How many mole of $\text{K}_2\text{Cr}_2\text{O}_7$ is required to oxidise two mole of ferrous sulphate in acidic medium?
 (1) $\frac{1}{9}$ (2) $\frac{1}{6}$
 (3) $\frac{1}{3}$ (4) $\frac{1}{2}$
66. If molality of a solute in its aqueous solution is 11.1 then mole fraction of solute will be
 (1) $\frac{10}{11}$ (2) $\frac{1}{12}$
 (3) $\frac{1}{6}$ (4) $\frac{1}{18}$
67. If x is the initial amount of reactant in a first order reaction $\text{A} \rightarrow \text{B}$, then the amount of reactant converted to product in two half lives will be
 (1) $\frac{15x}{16}$ (2) $\frac{7x}{8}$
 (3) $\frac{3x}{4}$ (4) $\frac{x}{16}$
68. The activation energy for the forward reaction, $\text{P} \rightarrow \text{Q}$ is 20 kJ mol^{-1} and the enthalpy change, ΔH of the reaction is $+5 \text{ kJ mol}^{-1}$. The activation energy (in kJ mol^{-1}) for the backward reaction will be
 (1) 30 (2) 20
 (3) 10 (4) 15
69. At low pressure van der Waals equation reduces to
 (1) $PV = nRT$
 (2) $\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT$
 (3) $P(V - nb) = nRT$
 (4) $\left(P + \frac{an^2}{V^2}\right)V = nRT$

70. If N is the number of atoms in the closely packed unit cell then the number of octahedral voids in that unit cell is equal to
- (1) N (2) $2N$
(3) $N/2$ (4) $N/4$
71. The polymer used for making electrical switches is
- (1) Neoprene (2) Teflon
(3) Bakelite (4) Melamine
72. Five moles of an ideal gas are expanded isothermally and reversibly at 400 K from 4 L to 20 L . ΔU for the process is
- (1) Zero (2) 180.6 cal
(3) 300 cal (4) -180.6 cal
73. Least basic compound in gaseous state among the following is
- (1) $(\text{CH}_3)_2\text{NH}$ (2) $(\text{CH}_3)_3\text{N}$
(3) CH_3NH_2 (4) NH_3
74. Partial charge on each oxygen atom in CO_3^{2-} is
- (1) $-\frac{1}{2}$ (2) $-\frac{1}{4}$
(3) $-\frac{1}{3}$ (4) $-\frac{2}{3}$
75. If $\text{H}^+(\text{aq}) + \text{OH}^-(\text{aq}) \rightarrow \text{H}_2\text{O}(\text{l})$, $\Delta H_1 = -56\text{ kJ/mole}$
 $2\text{H}(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$, $\Delta H_2 = -66\text{ kJ/mole}$
 $2\text{H}(\text{g}) + \text{O}(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$, $\Delta H_3 = -46\text{ kJ/mole}$
 and $\text{H}_2(\text{g}) + \frac{1}{2}\text{O}_2(\text{g}) \rightarrow \text{H}_2\text{O}(\text{l})$, $\Delta H_4 = -36\text{ kJ/mole}$
- Using above data the heat liberated for formation of 1 g water is
- (1) 36 kJ (2) 2 kJ
(3) 18 kJ (4) 1 kJ
76. K_c of a reaction $\text{A} + \text{B} \rightleftharpoons 2\text{C}$ is 0.5 at $T(\text{K})$. If concentration of all A , B and C have been taken initially as $2\left(\frac{\text{mol}}{\text{L}}\right)$, then the direction of reaction will be
- (1) The forward direction
(2) The backward direction
(3) Remain at equilibrium
(4) Equilibrium can never be achieved
77. If at $T^\circ\text{C}$ $K_w = 10^{-13}$ then an aqueous solution of pH of 8 will be
- (1) Weakly acidic (2) Basic
(3) Neutral (4) Strongly acidic
78. Which of the following group is ortho/para directing when attached with benzene ring?
- (1) $-\text{CHO}$ (2) $-\overset{\text{O}}{\parallel}{\text{C}}-\text{OH}$
(3) $-\text{OCH}_3$ (4) $-\text{NO}_2$
79. E°_{SRP} values of metals are given as
- $E^\circ_{\text{A}^+/\text{A}} = -2.54\text{ volt}$
 $E^\circ_{\text{B}^+/\text{B}} = -3.0\text{ volt}$
 $E^\circ_{\text{M}^+/\text{M}} = 1.25\text{ volt}$
 $E^\circ_{\text{N}^+/\text{N}} = 0.76\text{ volt}$
- Metal with strongest reducing nature is
- (1) A (2) B
(3) M (4) N
80. A 5% (w/v) solution of sucrose (M.W. = 342) is isotonic with 1.25% (w/v) of a solution having an unknown non-electrolytic/non-associating solute. The molar mass of unknown solute (in g/mol) is
- (1) 34.2 (2) 42.75
(3) 171 (4) 85.5
81. Reactions with molecularity greater than three are rare due to
- (1) Non-spherical nature of molecules
(2) Increase in entropy and activation energy
(3) Very less probability of simultaneous collision of more than three reacting species at a time
(4) Increase in non-elastic collisions
82. If all the ions along an axis passing through two opposite face centred are removed then effective number of Cl^- ions left in a unit cell of NaCl is
- (1) 2 (2) 3
(3) 3.5 (4) 2.5
83. Which among the following given sets of quantum numbers is impossible?
- (1) $n = 4, l = 2, m = -4, s = +1/2$
(2) $n = 4, l = 3, m = +1, s = +1/2$
(3) $n = 3, l = 2, m = 0, s = +1/2$
(4) $n = 4, l = 3, m = +2, s = +1/2$

84. The volume strength of 1.5 N H_2O_2 solution is
 (1) 4.4 V (2) 8.4 V
 (3) 16.8 V (4) 7.4 V
85. The degree of dissociation of 0.01 M CH_3COOH in 0.01 M HCl will be [$K_a(\text{CH}_3\text{COOH}) = 10^{-5}$]
 (1) 10^{-3} (2) 10^{-5}
 (3) 10^{-4} (4) 10^{-6}

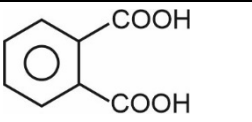
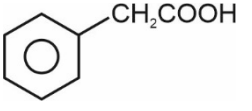
SECTION - B

86. **Statement I:** The addition of BHA (Butylated hydroxy anisole) to butter increase its shelf life from months to years.
Statement II: Sulphur dioxide and sulphite are useful antioxidants for wine and beer.
 In the light of above statements select the correct option
 (1) Both the statement I and statement II are correct
 (2) Both the statement I and statement II are incorrect
 (3) Statement I is correct but statement II is incorrect
 (4) Statement I is incorrect but statement II is correct
87. Which among the following is an antifertility drug?
 (1) Veronal (2) Dimetapp
 (3) Novestrol (4) Alitame
88. Which of the following is an example of negative charged sol?
 (1) Silver sol (2) Methylene blue sol
 (3) TiO_2 sol (4) $\text{Al}_2\text{O}_3 \cdot x\text{H}_2\text{O}$ sol
89. In the metallurgy of silver, metal is leached with
 (1) NaOH (2) HCl
 (3) H_2SO_4 (4) NaCN
90. Which of the following can have maximum number of isomers?
 (1) $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$
 (2) $[\text{Pt}(\text{en})_2\text{Cl}_2]$
 (3) $\text{K}_3[\text{Co}(\text{ox})_3]$
 (4) $[\text{Ni}(\text{CN})_2(\text{NH}_3)_4]\text{Cl}_2$
91. Carbylamine reaction and Reimer-Tiemann reaction have same
 (1) Reactants (2) Products
 (3) Electrophile (4) Nucleophile

92. Which of the following configuration an atom has the lowest ionization enthalpy?
 (1) $1s^2 2s^2 2p^5$ (2) $1s^2 2s^2 2p^6 3s^1$
 (3) $1s^2 2s^2 2p^4$ (4) $1s^2 2s^2 2p^3$
93. Among the following linear species is
 (1) H_3O^+ (2) NH_4^+
 (3) SO_2 (4) XeF_2
94. **Statement I:** Low density polythene have straight chain structure with some branches.
Statement II: LDP (Low density polythene) is obtained through the condensation polymerisation.
 In the light of above statements select the correct option.
 (1) Both the statement I and statement II are correct
 (2) Both the statement I and statement II are incorrect
 (3) Statement I is correct but statement II is incorrect
 (4) Statement I is incorrect but statement II is correct
95. Which of the following element has least melting point?
 (1) Sc (2) Au
 (3) Ag (4) Hg
96. The value of CFSE for d^5 system in an octahedral complex in presence of a strong field ligand is [P = electron pairing energy, Δ_0 = crystal field splitting energy in an octahedral field]
 (1) $-2\Delta_0$ (2) $-\frac{6}{5}\Delta_0 + 2P$
 (3) $-\frac{3}{5}\Delta_0$ (4) $-2\Delta_0 + 2P$
97. Which among the following is the most reactive?
 (1) Cl_2 (2) O_2
 (3) N_2 (4) ICI
98. Phenol and formaldehyde on polymerisation forms
 (1) Melamine (2) Bakelite
 (3) Glyptal (4) Dacron
99. RNA does not contain
 (1) Adenine (2) Guanine
 (3) Cytosine (4) Thymine

100. Match list-I with list-II and identify the correct option.

	List-I		List-II
(a)	Malonic acid	(i)	$\text{HOOC} - (\text{CH}_2)_2 - \text{COOH}$
(b)	Succinic acid	(ii)	$\text{HOOC} - (\text{CH}_2)_1 - \text{COOH}$

(c)	Phenylacetic acid	(iii)	
(d)	Phthalic acid	(iv)	

- (1) a(i), b(ii), c(iii), d(iv) (2) a(iv), b(iii), c(ii), d(i)
 (3) a(ii), b(i), c(iv), d(iii) (4) a(ii), b(i), c(iii), d(iv)

BOTANY

SECTION - A

101. What will be the number of chromosomes and DNA content in a cell in G_2 phase if it has 7 chromosomes and 7 pg DNA in G_1 phase?

	Chromosomes	DNA (pg)
(1)	7	7
(2)	14	14
(3)	14	7
(4)	7	14

102. All of the following are water pollinated plants **except**

- (1) *Vallisneria*
- (2) *Hydrilla*
- (3) *Zostera*
- (4) Water lily

103. Select the **incorrect** statement.

- (1) Royal Botanical Garden is an 'ex-situ' conservation strategy.
- (2) A museum has preserved plants and animals.
- (3) Key is a taxonomic aid for identification of specimens.
- (4) Herbarium houses live and conserved plant specimens.

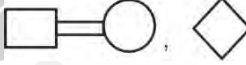



104. Decarboxylation occurs during which of the following reactions?

- (1) Pyruvic acid \rightarrow Lactic acid
- (2) Phosphoenol pyruvate \rightarrow Pyruvic acid
- (3) Phosphoglyceric acid \rightarrow Phosphoenol pyruvate
- (4) Pyruvic acid \rightarrow Ethanol

105. The subviral agents which were discovered by T.O. Diener

- (1) Contain DNA as genetic material
- (2) Are infectious proteinaceous particles
- (3) Do not cause any disease in plants
- (4) Are smallest infectious particles

106. Consanguineous mating and individual with unspecified sex in pedigree analysis are represented respectively by

- (1) 
- (2) 
- (3) 
- (4) 

107. Find the **incorrect** match

	Placentation	Plant
(1)	Marginal	Pea
(2)	Axile	Lemon
(3)	Parietal	China rose
(4)	Basal	Sunflower

108. Mark the **odd** one out w.r.t. autosomal disorder.

- (1) Haemophilia
- (2) Sickle cell anaemia
- (3) Phenylketonuria
- (4) Thalassemia

109. The living component of xylem is

- (1) Xylem fiber
- (2) Vessel
- (3) Xylem parenchyma
- (4) Tracheid

124. Which of the following statements are **correct**?
- Mammals from colder climates generally have shorter extremities in body.
 - Plants showing CAM pathway have scotoactive stomata.
 - At high altitudes, the binding capacity of haemoglobin for oxygen decreases.
 - Desert lizards cope with extreme temperature with the help of physiological adaptations.
 - Kangaroo rat is capable of meeting all its water requirements through internal fat oxidation.
- (a) and (b) only
 - (b), (c) and (d) only
 - All statements except (c)
 - All statements except (d)
125. Sclereid differs from both collenchyma and xylem vessel respectively in being
- Mechanical tissue and thick walled
 - Thick walled and conducting tissue
 - Simple tissue and elastic
 - Dead at maturity and providing gritty texture of fruit pulp
126. All of the following are observed at biodiversity hotspots, **except**
- Endemism
 - Species richness
 - No habitat loss
 - High degree of threat
127. Stele and bark is constituted by the presence of a common layer i.e.
- Xylem
 - Endodermis
 - Pericycle
 - Pith
128. How many of the following characters are seen in medicinal plant muliathi?
- Diadelphous condition
 - Monocarpellary gynoecium
 - Vexillary aestivation
 - Obliquely placed ovary
 - Axile placentation
 - Trilocular ovary
- 4
 - 3
 - 2
 - 1
129. Vascular cryptogams differ from amphibians of plant kingdom as former
- Have multicellular sex organs
 - Have photosynthetic gametophyte
 - Have sporophyte as dominant plant body
 - Show zygotic meiosis
130. (A) Oxygen acts as the final hydrogen acceptor in mitochondrial ETS.
(B) Cytochrome *c* is a mobile carrier between complex I and II
- Consider the above statements and select the **correct** option.
- Only (A) is correct
 - Only (B) is correct
 - Both the statements are correct
 - Both the statements are incorrect
131. Agar-agar is commercially obtained from
- Porphyra* and *Laminaria*
 - Gracilaria* and *Gelidium*
 - Fucus* and *Volvox*
 - Spirogyra* and *Gelidium*
132. Mark the **incorrect** statement
- Mn toxicity induces deficiency symptoms of iron, magnesium and calcium.
 - Girdling experiment shows that translocation of food occurs by phloem
 - Photosynthetic photosystems lack chlorophyll *a*
 - Ethylene helps in thinning of cotton, cherry and walnut.
133. The role of auxin is to
- Inhibit parthenocarpy in tomato
 - Stimulate root formation in stem cuttings
 - Inhibit apical dominance
 - Inhibit flowering in pineapple
134. Decarboxylation occurs during photorespiration in
- Mitochondrion
 - Chloroplast
 - Peroxisome
 - Chromoplast
135. Find the **incorrect** match.
- Penicillium* – Conidia
 - Chlamydomonas* – Zoospores
 - Hydra* – Buds
 - Opuntia* – Sucker

SECTION - B

136. All of the following are functions of cytoskeleton **except**
- (1) Mechanical support
 - (2) Osmoregulation
 - (3) Motility
 - (4) Maintenance of cell shape
137. Parthenocarpic fruits
- (1) Are also called false fruits
 - (2) Are developed without fertilisation
 - (3) Have a lot of tiny seeds
 - (4) Always have thalamus as edible part
138. Chlorophyll pigments are present in
- (1) Inner membrane of chloroplast
 - (2) Outer membrane of chloroplast
 - (3) Thylakoid membrane
 - (4) Stroma
139. If a colourblind woman marries a man whose father was colourblind and mother was normal, then what is the percentage of their son being colourblind?
- (1) 0%
 - (2) 25%
 - (3) 75%
 - (4) 100%
140. The homologous chromosomes synapse and separate during (i) and (ii) respectively. Select the correct option for (i) and (ii)
- | | (i) | | (ii) |
|---------------|-----|-------------|------|
| (1) Pachytene | | Anaphase II | |
| (2) Zygotene | | Anaphase I | |
| (3) Leptotene | | Anaphase I | |
| (4) Zygotene | | Anaphase II | |
141. If parents have blood groups A and B then, which blood group can be seen in offsprings?
- | | |
|-------|------|
| a. AB | b. O |
| c. A | d. B |
- (1) Only a
 - (2) Only b
 - (3) Only c and d
 - (4) All a, b, c and d
142. Equal weightage to vegetative and sexual characteristics was given in which system of classification?
- (1) Artificial system
 - (2) Natural system
 - (3) Phylogenetic system
 - (4) Both artificial and natural system
143. If *E. coli* growing medium has lactose, then
- (1) Repressor protein will bind to inducer molecule
 - (2) There will be no synthesis of repressor protein
 - (3) There will be no synthesis of enzymes from structural genes
 - (4) Repressor protein will bind to operator gene
144. Viroids and prions are similar as they
- (1) Have proteinaceous coat
 - (2) Are infectious agents
 - (3) Have dsDNA as genetic material
 - (4) Are smaller than viruses
145. Read the following statements and select the **correct** option.
- A. Virus free plants can be obtained from infected plant by anther culture.
 - B. Any part of a plant taken and grown in a test tube is called explant.
 - C. Lysine rich maize varieties developed in India are Jaya and Shakti.
 - D. Single cell protein can be exemplified by mushroom.
- (1) Only statement A is incorrect
 - (2) Only statement C is incorrect
 - (3) Both statements A and C are incorrect
 - (4) Both statements C and D are correct
146. Leaves are modified to store food in
- | | |
|------------|--------------|
| (1) Ginger | (2) Onion |
| (3) Potato | (4) Turmeric |
147. All of the following are functional aspects of ecosystem, **except**
- | | |
|-------------------|--------------------|
| (1) Productivity | (2) Energy flow |
| (3) Decomposition | (4) Stratification |
148. Vascular cambial ring is completely secondary in origin in
- | | |
|------------------|------------------|
| (1) Monocot root | (2) Dicot root |
| (3) Dicot stem | (4) Monocot stem |

149. Select the **wrong** statement.

- (1) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels
- (2) Mercury and DDT cannot be metabolised by fishes
- (3) Natural ageing of a lake by nutrient enrichment makes lake shallower and warmer
- (4) Disposal of radioactive wastes is done only about 50 m deep below earth's surface

150. (A) They are non living conduits.

- (B) Are parts of the apoplast.
- (C) They may have lignin deposition in ring like manner.
- (D) They are found in all categories of vascular plants.

Above statements are **true** for

- (1) Sieve tubes (2) Tracheids
- (3) Endodermal cells (4) Cortical cells

ZOOLOGY

SECTION - A

151. Smooth muscle fibres differ from skeletal muscle fibres as they

- (1) Are unbranched
- (2) Lack intercalated discs
- (3) Have actin and myosin filaments
- (4) Are non-striated in appearance

152. Choose the **odd** one w.r.t paired bones.

- (1) Parietal (2) Temporal
- (3) Palatine (4) Mandible

153. Which of the following is anterior most part of *Balanoglossus*?

- (1) Collar (2) Proboscis
- (3) Stomochord (4) Trunk

154. All of the following biomolecules are homopolymers, **except**

- (1) Chitin
- (2) Cellulose
- (3) Inulin
- (4) Collagen

155. Choose the **incorrect** statement w.r.t human reproduction

- (1) Sperm comes in contact with zona pellucida and induce changes in the membrane of the ovum.
- (2) Fertilization is feasible if both sperms and ovum are transported simultaneously to the ampullary region of fallopian tube.
- (3) Secretions of the acrosome help the sperm enter into the cytoplasm of ovum.
- (4) In females, meiosis-I is completed at the time of birth.

156. All of the following are secondary metabolites except

- (1) Rubber
- (2) Abrin
- (3) Anthocyanin
- (4) Amino acids

157. Read the following statements.

Statement A: Triceratops was a three horned, quadruped dinosaur.

Statement B: Brachiosaurus had plates on its back and was a flesh eating biped dinosaur.

Choose the **correct** option.

- (1) Both statements are correct.
- (2) Both statements are incorrect.
- (3) Statement A is correct but statement B is incorrect.
- (4) Statement A is incorrect but statement B is correct.

158. The first heart sound is associated with the

- (1) Closure of semilunar valves
- (2) Opening of mitral valve
- (3) Opening of tricuspid valve
- (4) Closure of atrio-ventricular valves

159. Breaking of cross bridge during muscle contraction is associated with

- (1) Binding of ATP to the head of myosin
- (2) Removal of ADP + Pi from myosin
- (3) Hydrolysis of ATP into ADP + Pi
- (4) Binding of ATP to actin

160. The opening of stomach into the duodenum is guarded by the
- (1) Sphincter of Oddi
 - (2) Gastro-oesophageal sphincter
 - (3) Ileo-caecal valve
 - (4) Pyloric sphincter
161. When pBR322 is digested with *Pvu* I and ligated with alien piece of DNA at its site, the recombinants will be
- (1) Ampicillin resistant
 - (2) Tetracycline susceptible
 - (3) Both ampicillin and tetracycline resistant
 - (4) Ampicillin susceptible
162. Which of the following is/are not included in seminal plasma?
- (1) Enzymes
 - (2) Calcium
 - (3) Sperms
 - (4) Fructose
163. Select the **incorrect** match.
- (1) FRC = ERV + RV
 - (2) TV = EC – ERV
 - (3) TV = VC – IRV
 - (4) TV = IC – IRV
164. Read the following statements and choose the option with **incorrect** statements only.
- (a) Typhoid fever could be confirmed by Widal test.
 - (b) Rhino viruses infect the nose and respiratory passage but not the lungs.
 - (c) *P. malariae* causes the most serious and fatal malignant malaria.
 - (d) Sporozoite form of *Plasmodium* are stored in the stomach of female *Aedes* mosquito.
- (1) (a) and (b)
 - (2) (a), (c) and (d)
 - (3) (b), (c) and (d)
 - (4) (c) and (d)
165. Hippocampus along with amygdala are parts of a complex structure present in forebrain. This complex structure is called
- (1) Association area
 - (2) Limbic system
 - (3) Sympathetic neural system
 - (4) Parasympathetic neural system
166. Increase in which of the following factors will shift the oxygen dissociation curve to the left side?
- (1) pCO₂
 - (2) Temperature
 - (3) pH
 - (4) H⁺ ions
167. In MOET,
- (1) A cow is administered hormones with progesterone like activity.
 - (2) Superovulation yields 1 to 2 eggs per cycle.
 - (3) Eggs are fertilised in surrogate mothers.
 - (4) The fertilized eggs are transferred to surrogate mothers.
168. Which of the following is not a part of brain stem but is part of hindbrain?
- (1) Pons
 - (2) Medulla oblongata
 - (3) Cerebellum
 - (4) Cerebrum
169. Match Column I and Column II.
- | Column I | Column II |
|-----------------------|----------------------|
| a. Protonephridia | (i) Prawn |
| b. Nephridia | (ii) <i>Planaria</i> |
| c. Malpighian tubules | (iii) Cockroach |
| d. Antennal glands | (iv) Earthworm |
- Choose the **correct** option.
- (1) a(iv), b(iii), c(i), d(ii)
 - (2) a(iii), b(iv), c(i), d(ii)
 - (3) a(iv), b(i), c(iii), d(ii)
 - (4) a(ii), b(iv), c(iii), d(i)
170. The first clinical gene therapy was given to a 4-year old girl with deficiency of enzyme
- (1) Glucose-6-phosphate dehydrogenase
 - (2) Adenosine deaminase
 - (3) Alcohol dehydrogenase
 - (4) Myosin ATPase
171. All the following are peptide hormones secreted from endocrine cells of gastro-intestinal tract, **except**
- (1) GIP
 - (2) CCK
 - (3) Secretin
 - (4) ANF

172. Which of the following part of nephron is **not** situated in the cortical region of the kidney?

- (1) Malpighian corpuscle
- (2) PCT
- (3) DCT
- (4) Loop of Henle

173. Plasmid is

- (1) Autonomously replicating, single stranded chromosomal RNA.
- (2) Autonomously replicating, closed circular, double stranded, extra chromosomal DNA.
- (3) A double stranded, linear, chromosomal RNA.
- (4) A closed circular, single stranded viral gene coding DNA.

174. Select the incorrect statement w.r.t. class Reptilia.

- (1) Fertilisation is internal
- (2) Heart is three-chambered usually
- (3) Tympanum represents ear
- (4) All reptiles have paired appendages

175. Select the **incorrect** match w.r.t. hormone, its source gland and function.

	Hormone	Source	Function
(1)	Melatonin	Pineal gland	Regulates diurnal rhythm
(2)	Thymosin	Thyroid gland	Regulates basal metabolic rate
(3)	Insulin	Pancreas	Regulates blood glucose level
(4)	CCK	Gastro-intestinal tract	Stimulates secretion of pancreatic enzymes and release of bile juice from gall bladder

176. Choose the set of bacterial diseases.

- (1) Ascariasis, dysentery
- (2) Diphtheria, filariasis
- (3) Plague, dysentery
- (4) Common cold, amoebiasis

177. Which of the following mouth part of a cockroach has grinding and incising regions?

- (1) Maxilla
- (2) Labium
- (3) Mandible
- (4) Labrum

178. Read the following statements carefully and select the **incorrect** statement.

- (1) Myelinated nerve fibres enveloped with Schwann cells are found in spinal and cranial nerves.
- (2) Unmyelinated nerve fibres are enclosed within Schwann cells and are commonly found in autonomous and somatic neural systems.
- (3) Multipolar neurons are found in cerebral cortex.
- (4) Neurons with one axon and one dendrite are found in the embryonic stage of all metazoans.

179. Mature form of recombinant human insulin lacks

- (1) Disulphide bonds
- (2) A-peptide chain
- (3) B-peptide chain
- (4) C-peptide chain

180. Select the characteristic not shared by amphibians and reptiles.

- (1) Oviparity
- (2) Three-chambered heart
- (3) Indirect development
- (4) Poikilothermy

181. Select the **incorrect** match w.r.t. hormones and their chemical nature.

- (1) Pancreatic hormones : Polypeptides
- (2) Thyroid hormones : Steroidal
- (3) Hormones of adrenal medulla : Amino acid derivatives
- (4) Pituitary hormones : Proteinaceous

182. Embryo with more than 16 blastomeres formed due to *in-vitro* fertilisation is transferred into

- (1) Cervix
- (2) Fallopian tube
- (3) Uterus
- (4) Fimbriae

183. In which of the following options, characteristic features hold **false** for the corresponding group of animals?

- (1) Reptilia – Body is covered by dry and cornified skin
- (2) Aves – Forelimbs always modified into functional wings for flight
- (3) Mammalia – Presence of milk producing glands
- (4) Amphibia – Poikilotherms with 3-chambered heart

184. The effects of genetic drift are mainly seen in

- (1) Small isolated population
- (2) Large isolated population
- (3) Non-reproductive population
- (4) A large, randomly mating population

185. During secretory phase of normal menstrual cycle, which hormone attains 1st peak and is essential for maintenance of endometrium?

- (1) LH
- (2) FSH
- (3) Progesterone
- (4) Estrogen

SECTION - B

186. Which of the following is a hermaphrodite animal?

- (1) Leech (2) Ascaris
- (3) Spider (4) Honeybee

187. Read the following statements.

Statement A : In primary structure of a protein, the left end is represented by the first amino acid and the right end by the last amino acid.

Statement B : In a polysaccharide chain, the right end is called the reducing end and the left end is called the non-reducing end.

Choose the **correct** option.

- (1) Both the statements are correct
- (2) Both the statements are incorrect
- (3) Statement A is correct but statement B is incorrect
- (4) Statement A is incorrect but statement B is correct

188. Which of the following contraceptive methods has maximum chances of failure

- (1) Periodic abstinence (2) Vasectomy
- (3) IUDs (4) Condoms

189. In which of the following, the genus name, its character and its phylum are **not** correctly matched?

	Genus name	Character	Phylum
(1)	<i>Gorgonia</i>	Presence of stinging capsules	Coelenterata
(2)	<i>Ancylostoma</i>	Pseudocoelom	Aschelminthes
(3)	<i>Bombyx</i>	Jointed appendages	Arthropoda
(4)	<i>Cucumaria</i>	Water canal system	Echino-dermata

190. The enzyme that is not present in pancreatic juice is

- (1) Lipases
- (2) Maltase
- (3) Trypsinogen
- (4) Procarboxypeptidase

191. Choose incorrect option w.r.t. cardiac muscle fibres

- (1) Present only in heart
- (2) Communication junctions are present at some fusion points
- (3) Striations present
- (4) Multinucleated

192. All of the following are true for glucocorticoids, **except**

- (1) Produce anti-inflammatory reactions
- (2) Suppresses the immune response
- (3) Stimulate cellular uptake and utilisation of amino acids
- (4) Stimulates lipolysis and proteolysis

193. Every 100 mL of deoxygenated blood delivers approximately _____ of CO₂ to the alveoli.

Select the **correct** option to fill the blank.

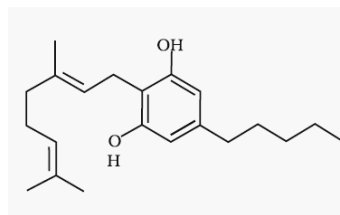
- (1) 5 mL (2) 4 mL
- (3) 15 mL (4) 20 mL

194. Receptors associated with aortic arch and carotid artery can recognise changes in concentration of

- (1) CO₂ and H⁺ (2) CO₂ and N₂
- (3) N₂ and H⁺ (4) H⁺ and Cl⁻

195. Blood plasma contains 'X' that is/are needed for coagulation of blood. Identify 'X'
- (1) Globulins
 - (2) Albumin
 - (3) Cholesterol
 - (4) Fibrinogens
196. Select the **incorrect** statement w.r.t. standard ECG
- (1) P-wave represents repolarisation of the atria.
 - (2) QRS complex represents the depolarisation of ventricles.
 - (3) T-wave represents repolarisation of ventricle.
 - (4) ECG is of a great clinical significance.
197. Urine formation involves three main processes. Which of the following process takes place with the help of slit pores?
- (1) Filtration
 - (2) Reabsorption
 - (3) Secretion of H^+
 - (4) Secretion of NH_3

198. All of the following represent synovial joints except
- (1) Pivot joint
 - (2) Hinge joint
 - (3) Fibrous joints
 - (4) Gliding joint
199. Below given structure represents



- (1) Smack
 - (2) Morphine
 - (3) Cannabinoid
 - (4) Cocaine
200. Analogous structures are result of
- (1) Divergent evolution
 - (2) Convergent evolution
 - (3) Adaptive radiation
 - (4) Stabilizing selection

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Detailed Video Solutions

(*Video will be available to access post
8 p.m. on 18th April, 2023 onwards)



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18/04/2023



Phase-1
CODE-B

Corporate Office: Aakash Tower, 8, Pusa Road, New Delhi-110005, Ph.011-47623456

FINAL TEST SERIES for NEET-2023

MM : 720

Test-9

Time : 3 Hrs. 20 Mins.

Answers

1. (1)	41. (4)	81. (3)	121. (4)	161. (4)
2. (3)	42. (2)	82. (2)	122. (1)	162. (3)
3. (4)	43. (2)	83. (1)	123. (2)	163. (3)
4. (1)	44. (3)	84. (2)	124. (4)	164. (4)
5. (2)	45. (2)	85. (1)	125. (4)	165. (2)
6. (1)	46. (3)	86. (1)	126. (3)	166. (3)
7. (2)	47. (3)	87. (3)	127. (3)	167. (4)
8. (2)	48. (1)	88. (1)	128. (2)	168. (3)
9. (4)	49. (2)	89. (4)	129. (3)	169. (4)
10. (1)	50. (2)	90. (4)	130. (1)	170. (2)
11. (2)	51. (3)	91. (3)	131. (2)	171. (4)
12. (4)	52. (4)	92. (2)	132. (3)	172. (4)
13. (2)	53. (1)	93. (4)	133. (2)	173. (2)
14. (4)	54. (1)	94. (3)	134. (1)	174. (4)
15. (1)	55. (3)	95. (4)	135. (4)	175. (2)
16. (2)	56. (2)	96. (4)	136. (2)	176. (3)
17. (1)	57. (3)	97. (4)	137. (2)	177. (3)
18. (2)	58. (1)	98. (2)	138. (3)	178. (4)
19. (4)	59. (2)	99. (4)	139. (4)	179. (4)
20. (3)	60. (2)	100. (3)	140. (2)	180. (3)
21. (2)	61. (4)	101. (4)	141. (4)	181. (2)
22. (1)	62. (3)	102. (4)	142. (1)	182. (3)
23. (4)	63. (3)	103. (4)	143. (1)	183. (2)
24. (4)	64. (4)	104. (4)	144. (2)	184. (1)
25. (4)	65. (3)	105. (4)	145. (3)	185. (3)
26. (3)	66. (3)	106. (1)	146. (2)	186. (1)
27. (4)	67. (3)	107. (3)	147. (4)	187. (1)
28. (3)	68. (4)	108. (1)	148. (2)	188. (1)
29. (4)	69. (4)	109. (3)	149. (4)	189. (4)
30. (1)	70. (1)	110. (2)	150. (2)	190. (2)
31. (4)	71. (3)	111. (2)	151. (4)	191. (4)
32. (4)	72. (1)	112. (2)	152. (4)	192. (3)
33. (2)	73. (4)	113. (2)	153. (2)	193. (2)
34. (2)	74. (4)	114. (2)	154. (4)	194. (1)
35. (1)	75. (2)	115. (3)	155. (4)	195. (4)
36. (3)	76. (2)	116. (2)	156. (4)	196. (1)
37. (1)	77. (2)	117. (1)	157. (3)	197. (1)
38. (2)	78. (1)	118. (3)	158. (4)	198. (3)
39. (1)	79. (2)	119. (2)	159. (1)	199. (3)
40. (4)	80. (4)	120. (2)	160. (4)	200. (2)

FINAL TEST SERIES for NEET-2023

MM : 720

Test-9

Time : 3 Hrs. 20 Mins.

Answers and Solutions**PHYSICS****SECTION - A**

1. Answer (1)

Velocity can be derived from length and time.

2. Answer (3)

$$\left(\frac{\Delta Z}{Z}\right) \times 100 = \left(3 \times 1 + \frac{1}{3} \times 3 + 2 + \frac{3}{2} \times 4\right) \%$$

$$= 12\%$$

$$\text{Hence } \frac{\Delta Z}{Z} = 1.2 \times 10^{-1}$$

3. Answer (4)

$$R = 6T^2$$

$$\frac{2u^2 \sin \theta \cos \theta}{g} = \frac{6 \times 4u^2 \cos^2 \theta}{g^2}$$

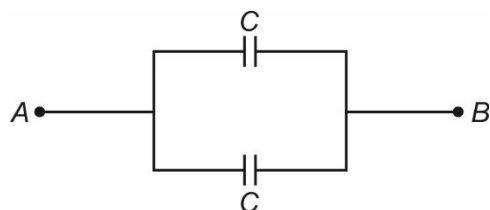
$$\Rightarrow \tan \theta = \frac{12}{g} = \frac{6}{5}$$

4. Answer (1)

$$B = \frac{\mu_0 NI}{2R}$$

5. Answer (2)

Equivalent circuit will be



$$C_{eq} = 2C$$

6. Answer (1)

$$\phi = \frac{q_{in}}{\epsilon_0}$$

$$q_{in} = 0$$

$$\phi = 0$$

7. Answer (2)

Induced charge will distribute on outer surface of shell uniformly

$$\text{Hence, } E_p = \frac{KQ}{r^2} = \frac{KQ}{9R^2}$$

8. Answer (2)

$$n_e \cdot n_h = n_i^2$$

$$n_e = \frac{n_i^2}{n_h} = \frac{[1.7 \times 10^{15}]^2}{4.7 \times 10^{21}} = \frac{1.7 \times 1.7 \times 10^{30}}{4.7 \times 10^{21}}$$

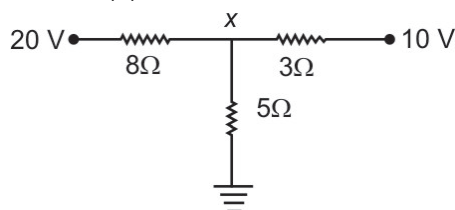
$$= 6.14 \times 10^8 \text{ m}^{-3}$$

9. Answer (4)

$$P = \omega^2 A \Rightarrow \frac{P}{Q} = \omega = \frac{2\pi}{T}$$

$$T = \frac{2\pi Q}{P}$$

10. Answer (1)



$$\frac{x-20}{8} + \frac{x-10}{3} + \frac{x-0}{5} = 0$$

$$\Rightarrow 15x - 300 + 40x - 400 + 24x = 0$$

$$\Rightarrow 79x = 700$$

$$x = 8.86$$

$$\text{Hence current through switch } I = \frac{8.86}{5} = 1.77A$$

11. Answer (2)

As kinetic energy of emitted electron = energy of incident radiation.

$$\frac{1}{2}mv^2 = \frac{hc}{\lambda}$$

$$\frac{p^2}{2m} = \frac{hc}{\lambda} \Rightarrow p = \sqrt{\frac{2mhc}{\lambda}}$$

$$\therefore \lambda_0 = \frac{h}{p} = \frac{h}{\sqrt{\frac{2mhc}{\lambda}}} = \sqrt{\frac{h\lambda}{2mc}}$$

$$\text{Hence } \lambda_0^2 = \frac{\lambda h}{2mc} \Rightarrow \lambda = \left(\frac{2mc}{h}\right) \lambda_0^2$$

12. Answer (4)

$m \rightarrow$ mass of hanging part

$l \rightarrow$ length of hanging part

$$W = mg \frac{l}{2}$$

$$= \frac{M}{L} l g \frac{l}{2}$$

$$= \frac{Mgl^2}{2L} = \frac{80 \times (1.2)^2}{2 \times 4}$$

$$= 14.4 \text{ J}$$

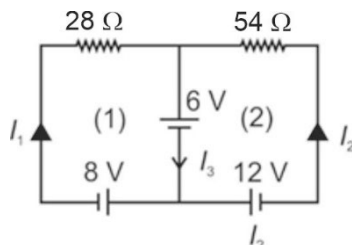
13. Answer (2)

$$x = 5 + 8t^2$$

$$v = 16t$$

$$a = 16 \text{ cm/s}^2 \text{ is constant}$$

14. Answer (4)



Applying KVL for loop (1) and loop (2)

$$28 I_1 = -6 - 8 \Rightarrow I_1 = -\frac{1}{2}A$$

$$54 I_2 = -6 - 12 \Rightarrow I_2 = -\frac{1}{3}A$$

$$\text{Hence } I_3 = I_1 + I_2 = -\frac{5}{6}A$$

$$\text{Hence } I = -I_3 = \frac{5}{6}A$$

15. Answer (1)

$$\frac{f_{\text{air}}}{f_{\text{water}}} = \frac{(w\mu_g - 1)}{(a\mu_g - 1)}$$

$$\Rightarrow f_{\text{water}} = \left(\frac{\frac{3}{2} - 1}{\frac{9}{8} - 1}\right) f_{\text{air}} = 4f_{\text{air}}$$

$$\text{Hence } f_{\text{water}} = 15 \times 4 = 60 \text{ cm}$$

16. Answer (2)

$$g - g' = \omega^2 R \cos^2 30^\circ$$

$$= \omega^2 R \left[\frac{\sqrt{3}}{2}\right]^2 = \frac{3}{4} \omega^2 R$$

17. Answer (1)

$$\eta_A = 1 - \frac{400}{1000} = 0.6$$

$$\eta_B = 1 - \frac{500}{1100} = 0.545$$

$$\text{Hence } \eta_A > \eta_B$$

18. Answer (2)

$$I_1 N_1 = I_2 N_2 \Rightarrow I_2 = \frac{I_1 N_1}{N_2}$$

$$I_2 = 7 \times \frac{140}{280} = 3.5A$$

19. Answer (4)

At steady state no current will flow through capacitor,

$$\text{So } I = \frac{E}{R_2 + r} = \frac{5}{5} = 1A$$

$$\text{P.d. across each branch} = 1 \times 4 = 4V$$

$$\text{Charge on each capacitor} = \frac{C}{2} \times 4$$

$$= \frac{3}{2} \times 4 = 6\mu C$$

$$\text{Hence } Q = 6 \times 4 = 24 \mu C$$

20. Answer (3)

$$Q = (4 \times 7.1 - 4(1.15)) \text{ MeV}$$

$$= 23.8 \text{ MeV}$$

21. Answer (2)

Radio waves are low frequency waves among the given waves. So, their wavelength will be comparatively large.

22. Answer (1)

$$I_1 = I \text{ and } I_2 = 4I \quad \Delta\phi = \frac{\pi}{2}$$

$$I_{\text{net}} = I + 4I + 2\sqrt{I \cdot 4I} \cos \frac{\pi}{2}$$

$$= 5I$$

23. Answer (4)

$$M = M_0 e^{-\lambda t}$$

$$M = 20e^{\frac{\lambda \cdot 2}{\lambda}} = 20e^{-2}$$

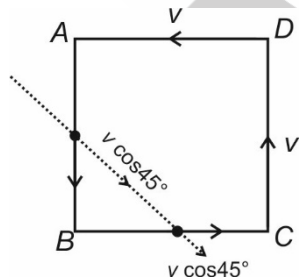
$$= 2.7 \text{ g}$$

24. Answer (4)

Since R_1 and R_2 are different hence the peaks during positive half and negative half will be different.

25. Answer (4)

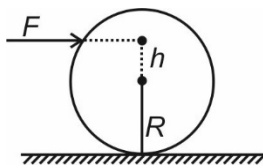
Each particle will reach at the middle of sides of square after time $\frac{d}{2v}$



$$v_{\text{app}} = v_{\cos 45^\circ} - v_{\cos 45^\circ} = 0$$

26. Answer (3)

For pure rolling



$$h = \frac{I_{cm}}{MR} = \frac{MR^2}{2 \times MR} = \frac{R}{2}$$

$$\therefore \text{ from surface } H = h + R = R + \frac{R}{2}$$

$$= \frac{3R}{2}$$

27. Answer (4)

$$I_1 = \frac{ml^2}{3}$$

$$I_2 = \frac{ml^2}{3}$$

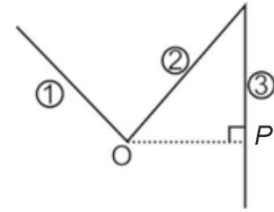
$$I_3 = \frac{ml^2}{12} + m(OP)^2$$

$$= \frac{ml^2}{12} + m\left(\frac{\sqrt{3}}{2}l\right)^2 = \frac{5}{6}ml^2$$

$$\therefore I = I_1 + I_2 + I_3$$

$$= \frac{ml^2}{3} + \frac{ml^2}{3} + \frac{5}{6}ml^2$$

$$= \frac{3ml^2}{2}$$



28. Answer (3)

$$T = 2\pi\sqrt{\frac{l}{g}}$$

$$\Rightarrow g = \frac{4\pi^2 l}{T^2}$$

$$\Rightarrow g \propto \frac{l}{T^2}$$

$$\Rightarrow \frac{\Delta g}{g} \times 100 = \frac{\Delta l}{l} \times 100 + \frac{2\Delta T}{T} \times 100$$

$$\therefore T = \frac{t}{n} \Rightarrow \frac{\Delta T}{T} \times 100 = \frac{\Delta t}{t} \times 100$$

$$\Rightarrow 2 \frac{\Delta T}{T} \times 100 = \frac{2 \times 0.2}{100} \times 100 = 0.4\%$$

$$\text{Similarly, } \frac{\Delta l}{l} \times 100 = \frac{1 \times 10^{-3}}{50 \times 10^{-2}} \times 100$$

$$= 0.2\%$$

$$\frac{\Delta g}{g} \times 100 = 0.2\% + 0.4\%$$

$$= 0.6\%$$

29. Answer (4)

$$x - B = A \sin \omega t$$

$$x = B + A \sin \omega t$$

30. Answer (1)

$$\frac{PV}{RT} = \text{constant} = n$$

$$\Rightarrow \frac{P_0 V_0}{RT} = n_0 = \frac{P_1(V_0 + V)}{RT}$$

$$\Rightarrow P_1(V_0) = P_2(V_0 + V)$$

$$\Rightarrow \left(\frac{P_0 V_0}{V_0 + V} \right) \times V_0 = P_2(V_0 + V)$$

$$\Rightarrow P_2 = \frac{P_0 V_0^2}{(V_0 + V)^2}$$

∴ Number of moles after second stroke is

$$n_2 = \frac{P_2 V_0}{RT} = \frac{P_0 V_0^3}{(V_0 + V)^2 RT}$$

31. Answer (4)

(1) Since the process is cyclic hence

$$\Delta U = \Delta U_1 + \Delta U_2 = 0$$

(2) From 1st law of thermodynamics

$$\Delta Q = \Delta U + W$$

$$= 0 + W \Rightarrow \Delta Q < 0$$

Heat is rejected by the system

(3) Work done by the gas from 1 to 2 is less positive than negative work done by the gas from 2 to 1.

32. Answer (4)

Since magnetic field is not varying w.r.t time,

$$\text{Therefore, } \frac{d\phi}{dt} = 0$$

$$E_{in} = 0$$

33. Answer (2)

Let ground state energy (in eV) be E_1

Then from the given condition

$$E_{2n} - E_1 = 204 \text{ eV}$$

$$\frac{E_1}{(2n)^2} - E_1 = 204 \text{ eV} \quad \dots(i)$$

$$E_{2n} - E_n = 40.8 \text{ eV}$$

$$\frac{E_1}{4n^2} - \frac{E_1}{n^2} = 40.8 \text{ eV} \quad \dots(ii)$$

From equation (i) and (ii)

$$1 - \frac{1}{4n^2} = 5 \Rightarrow n = 2$$

34. Answer (2)

$$\vec{F} \perp \vec{B}$$

$$\vec{F} \cdot \vec{B} = 0$$

$$-1 + 2y - 3 = 0$$

$$y = \frac{4}{2} = 2$$

$$\vec{F} \perp \vec{v}$$

$$\vec{F} \cdot \vec{v} = 0$$

$$-2 + 6 - z = 0$$

$$z = 4$$

35. Answer (1)

Mirror equation

$$\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$$

$$\Rightarrow \frac{f}{v} + \frac{f}{u} = 1$$

$$\Rightarrow \frac{1}{(v/f)} + \frac{1}{(u/f)} = 1 \Rightarrow \frac{1}{y} + \frac{1}{x} = 1$$

SECTION - B

36. Answer (3)

Here direction of light is given by vector

$$\vec{\eta} = i + 2j + 3k$$

Hence angle made by $\vec{\eta}$ with y-axis is

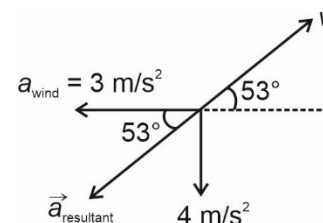
$$\cos \theta = \frac{2}{\sqrt{14}} \Rightarrow \theta = \cos^{-1} \left(\frac{2}{\sqrt{14}} \right)$$

37. Answer (1)

$$a = \frac{v dv}{ds}$$

$$= 6 \times 1 = 6 \text{ m/s}^2$$

38. Answer (2)



For ball to travel on straight line, angle between velocity vector and acceleration vector must be either 0° or 180° .

39. Answer (1)

The nail hits the sand with speed v_0 after falling height h

$$v_0^2 = 2gh \Rightarrow v_0 = \sqrt{2gh} \quad \dots(1)$$

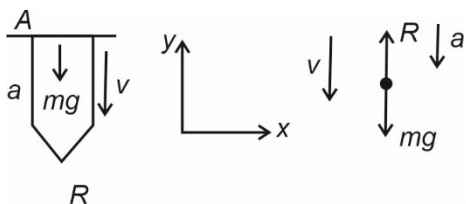
Nail stops after time t

$$\text{Net force on nail} = (mg - R) = -ma$$

$$R = m(g + a)$$

a = deceleration of nail

$$0 - v_0^2 = -2ax$$

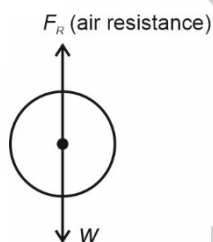


Putting v_0 from equation (1)

$$2gh = 2\left(\frac{R - mg}{m}\right)x$$

$$R = mg\left(\frac{h}{x} + 1\right)$$

40. Answer (4)



Air resistance increases with velocity. Initially when velocity is small, weight is more than air resistance and velocity increases. For a particular velocity resistance force becomes equal to weight hence $a = 0$ and velocity = constant.

41. Answer (4)

Heat required to melt 10 gm ice at 0°C

$$= 10 \times 80 = 800 \text{ cal}$$

800 cal heat have to be absorbed m gm water at 50°C .

$$\therefore 800 = m \times 1 \times 50, m = 16 \text{ gm}$$

$$m = 16 \text{ gm}$$

42. Answer (2)

$$x_{\text{cm}} = \frac{\sum m_i x_i}{\sum m_i} = 1.3$$

$$y_{\text{cm}} = \frac{\sum m_i y_i}{\sum m_i} = \frac{6}{10} = 0.6$$

43. Answer (2)

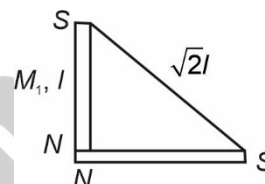
Pressure at liquid surface outside the capillary is

P_0 . As we go up a distance $\frac{h}{2}$ pressure decreases by $\frac{\rho gh}{2}$.

44. Answer (3)

When a paramagnetic substance is placed in a magnetic field, then the internal magnetic field is stronger than the outside field. This is caused due to the presence of electrons with unpaired spins in atoms or molecules. The atom or molecule acts like a tiny magnet. In presence of external magnetic field, the magnets tend to align with field.

45. Answer (2)



Magnetic moment, $(M) = 2 \text{ ml}$

$$M_1 = M_2 = \frac{M}{2}$$

If the magnet is divided into halves then pole strength remains same length becomes half.

$$M_R = \sqrt{M_1^2 + M_2^2} = \frac{M}{\sqrt{2}}$$

46. Answer (3)

Since maximum number of molecules travel with speed 1.6 km/s so $V_{mp} = 1.6 \text{ km/s}$

47. Answer (3)

$$A = \sqrt{a_1^2 + a_2^2 + 2a_1 a_2 \cos \phi}$$

$$= \sqrt{(4)^2 + (3)^2 + 2 \times 4 \times 3 \times \cos 90^\circ}$$

$$= 5 \text{ unit}$$

48. Answer (1)

$$e = -\frac{Ldl}{dt}$$

$$5 = -2\frac{dl}{dt}$$

$$\frac{dl}{dt} = -2.5 \text{ A/s}$$

49. Answer (2)

When no power is drawn in the secondary coil of an ideal transformer, the power drawn in the primary coil is also zero, *i.e.*, the primary coil circuit is a purely inductive circuit in an ideal transformers.

∴ Power factor = 0

50. Answer (2)

$$Q = \frac{1}{R} \sqrt{\frac{L}{C}} \text{ or } \frac{L}{C} = (QR)^2$$

$$L = (0.4 \times 2 \times 10^3)^2 \times 0.1 \times 10^{-6} \\ = 0.064 \text{ H}$$

CHEMISTRY

SECTION - A

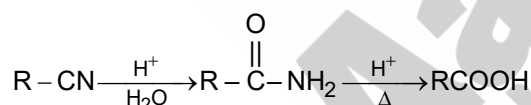
51. Answer (3)

Mischmetal alloy mainly consists of Lanthanoids metals.

52. Answer (4)

- Aluminium → Electrolysis of Al_2O_3 dissolved in molten Na_3AlF_6
- Iron → Reduction of the oxide with CO and Coke in Blast furnace
- Copper → Roasting of sulphide partially and reduction
- Zinc → Roasting followed by reduction with coke

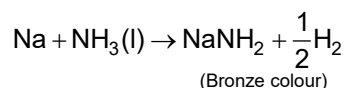
53. Answer (1)



54. Answer (1)

The sugar moiety present in DNA molecules is β -D-2-deoxyribose.

55. Answer (3)



56. Answer (2)

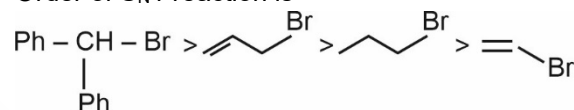
It is Markovnikov addition of water without rearrangement.

57. Answer (3)

α -D-glucose and β -D-glucose are two cyclic form of glucose which convert into each other form and open chain structure, this is known as mutarotation

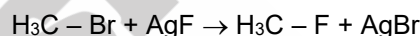
58. Answer (1)

- Order of $\text{S}_{\text{N}}1$ reaction is

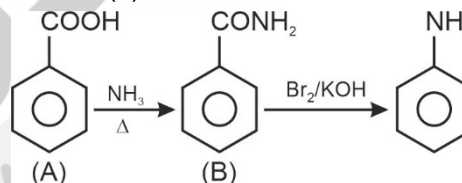


59. Answer (2)

The synthesis of alkyl fluorides is best accomplished by heating an alkyl chloride/bromide in the presence of a metallic fluoride such as AgF , Hg_2F_2 , CoF_2 or SbF_3 . This reaction is termed as Swarts reaction.



60. Answer (2)



61. Answer (4)

All three types of hydrocarbons can be produced from Kolbe's electrolytic method.

62. Answer (3)

Lithium give red colour in flame but magnesium does not give any colour in flame.

63. Answer (3)

$$\therefore \text{Number of moles} = \frac{100}{20} = 5$$

$$\therefore \text{Number of molecules} = 5 N_A$$

$$\therefore \text{Number of electrons} = 10 \times 5 N_A \\ = 50 N_A$$

64. Answer (4)

For $l = 1$,

$$\text{Orbital angular momentum} = \hbar \sqrt{l(l+1)}$$

$$= \sqrt{l(l+1)} \hbar$$

$$= \sqrt{2} \hbar$$

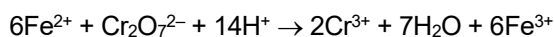
For $l = 2$,

$$\text{Orbital angular momentum} = \sqrt{2(2+1)}\hbar$$

$$= \sqrt{6}\hbar$$

$$\therefore \text{Ratio} = \sqrt{2} : \sqrt{6} = 1 : \sqrt{3}$$

65. Answer (3)



• 6 moles of Fe^{+2} react with 1 mole of $\text{Cr}_2\text{O}_7^{2-}$

• 2 moles of Fe^{+2} react with = $\frac{1}{3}$ mole of $\text{Cr}_2\text{O}_7^{2-}$.

66. Answer (3)

Let x_B is mole fraction of solute.

$$m = \frac{x_B}{1-x_B} \times \frac{1000}{18}$$

$$11.1 = \frac{x_B}{1-x_B} \times 55.5$$

$$0.2 = \frac{x_B}{1-x_B}$$

$$0.2 - 0.2x_B = x_B$$

$$1.2x_B = 0.2$$

$$x_B = \frac{0.2}{1.2} = \frac{2}{12} = \frac{1}{6}$$

67. Answer (3)

$$\text{Amount converted to product} = x - \frac{x}{4} = \frac{3x}{4}$$

68. Answer (4)

$$\Delta H = E_{a(f)} - E_{a(b)}$$

$$\Rightarrow E_{ab} = 20 - (+5) = 15 \text{ kJ mol}^{-1}$$

69. Answer (4)

van der Waal's equation for real gas is

$$\left(P + \frac{an^2}{V^2}\right)(V - nb) = nRT, \text{ at low pressure van der}$$

$$\text{Waal's equation reduces to } \left(P + \frac{an^2}{V^2}\right)V = nRT.$$

70. Answer (1)

Number of octahedral voids formed = number of atom in the unit cell.

71. Answer (3)

Bakelite is used for making of electrical switches.

72. Answer (1)

For ideal gas.

$$\Delta U = nC_v\Delta T$$

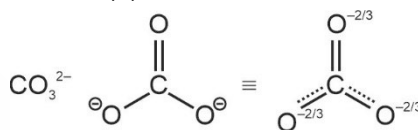
For isothermal reversible expansion, $\Delta T = 0$, hence $\Delta U = 0$, for ideal gas.

73. Answer (4)

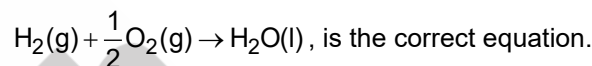
The basis order of amines in gaseous state is $(\text{CH}_3)_3\text{N} > (\text{CH}_3)_2\text{NH} > \text{CH}_3\text{NH}_2 > \text{NH}_3$

[\therefore As +I effect increases basicity of amines also increase]

74. Answer (4)



75. Answer (2)



For 1 mole of $\text{H}_2\text{O} = -36 \text{ kJ}$

$$18 \text{ g} = -36 \text{ kJ}$$

$$1 \text{ g} = \frac{-36}{18} \text{ kJ}$$

$= -2 \text{ kJ}$, so 2 kJ heat will be released.

76. Answer (2)

$$\text{As } Q_c = \frac{(2)^2}{2 \times 2} = 1 \text{ as } Q_c > K_c$$

So reactions will shift in the backward direction.

77. Answer (2)

$$\text{As } K_w = 10^{-13}$$

\therefore pH of neutral water = 6.5, so pH > 6.5 is basic in nature.

78. Answer (1)

$-\text{OCH}_3$ is showing +M effect that's why it is ortho-para directing

79. Answer (2)

B contain least standard reducing potential so it has strongest reducing nature.

80. Answer (4)

For isotonic solution

$$\pi_1 = \pi_2$$

$$\therefore C_1 = C_2$$

$$\frac{50}{342} = \frac{12.5}{M}$$

$$\therefore M = \frac{12.5 \times 342}{50} = 85.5$$

81. Answer (3)

For more than three molecularity, the probability for simultaneous collision is very small, hence, reaction with the molecularity three or more than three are very rare.

82. Answer (2)

An axis passing through two opposite face centred contain two face atoms.

So, total number of face atoms = $6 - 2 = 4$

Total number of Cl^- ions left

$$= 8 \times \frac{1}{8} + 4 \times \frac{1}{2} = 3$$

83. Answer (1)

- $n > \ell$
- $m = (-\ell)$ to $(+\ell)$ including zero, so ℓ can never be greater than m .

If $n = 4$, ℓ can be 0, 1, 2, 3

and $\ell = 2$ so m can be $-2, -1, 0, +1, +2$ only not -4 .

84. Answer (2)

Volume strength = $N \times 5.6 = 5.6 \times 1.5 = 8.4$

85. Answer (1)

$[\text{CH}_3\text{COOH} + \text{HCl}]$ contain common ion effect.

Concentration of $[\text{H}^+]$ common ions $\approx 10^{-2}$ M.

$$\text{So, } \alpha = \frac{K_a}{[\text{common ion}]} = \frac{10^{-5}}{10^{-2}} = 10^{-3}$$

SECTION - B

86. Answer (1)

SO_2 and sulphite are useful antioxidants for wine and beer, sugar syrups and cut, peeled or dried fruits and vegetables.

87. Answer (3)

Antifertility Drugs are norethindrone and ethynylestradiol (Novestrol).

88. Answer (1)

Silver sol is a negative charged sol

89. Answer (4)

In the metallurgy of silver and gold, the respective metal is leached with a dilute solution of NaCN or KCN .

90. Answer (4)

In $[\text{Ni}(\text{CN})_2(\text{NH}_3)_4]\text{Cl}_2$

Linkage, geometrical, ionization isomerism are possible.

91. Answer (3)

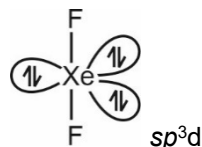
Electrophile is : CCl_2 in both reaction.

92. Answer (2)

$1s^2 2s^2 2p^6 3s^1$ is a electronic configuration of a potassium it contain lowest ionization enthalpy among all given option.

93. Answer (4)

XeF_2 is linear structure



94. Answer (3)

LDP is obtained through the free radical addition and H-atom abstraction.

95. Answer (4)

Generally transition metal have high melting point because of high enthalpy of atomization.

[\therefore Greater the number of unpaired electron higher is the melting point]

Hg is not consider as transition metal and contain least enthalpy of atomization.

96. Answer (4)

Electronic configuration of d^5 in low spin complex



$$\text{CFSE} = \left[5 \left(-\frac{2}{5} \right) + 0 \times \frac{3}{5} \right] \Delta_0 + 2p = -2\Delta_0 + 2p$$

97. Answer (4)

Interhalogen compounds are more reactive than halogens, oxygen and nitrogen molecule.

98. Answer (2)

Phenol and formaldehyde on polymerisation forms Bakelite.

99. Answer (4)

RNA contain four bases Adenine, Guanine Cytosine and Uracil.

100. Answer (3)

- Malonic Acid \rightarrow
- Succinic Acid \rightarrow
- Phenylacetic Acid \rightarrow
- Phthalic Acid \rightarrow

BOTANY**SECTION - A**

101. Answer (4)

DNA replication takes place in S phase which comes before G₂ phase during this chromosome number remains same and amount of DNA doubles in a cell.

102. Answer (4)

Water lily is an aquatic plant and is pollinated by insects or wind.

103. Answer (4)

Herbarium has dried and preserved plant specimens.


104. Answer (4)

During alcoholic fermentation, CO₂ is evolved along with ethanol as product

105. Answer (4)

Viroids are the smallest infectious particles discovered by Diener.

106. Answer (1)

Consanguineous mating refers to mating between relatives. It is represented as .

Individual with unspecified sex is represented as



107. Answer (3)

China rose shows axile placentation

108. Answer (1)

Haemophilia is an X-linked recessive disorder.

109. Answer (3)

Xylem parenchyma is the living component of xylem.

110. Answer (2)

If hybrids are made into apomicts, there is no segregation of characters in the hybrid progeny.

111. Answer (2)

Cambium is present in dicots.

112. Answer (2)

DNA as an acidic substance present in nucleus was first identified by Friedrich Miescher in 1869.

113. Answer (2)

Non flagellated gametes are produced by *Spirogyra* and *Gelidium*.

114. Answer (2)

Severo Ochoa enzyme is helpful in polymerising RNA with defined sequences in a template independent manner in nucleus.

115. Answer (3)

Facilitated diffusion does not require ATP.

116. Answer (2)

Wheat is resistant to cereal leaf beetle due to presence of hairy leaves.

117. Answer (1)

Boron helps in translocation of carbohydrates through phloem.

118. Answer (3)

A small part of the activated sludge is pumped back into the aeration tank to serve as inoculum.

119. Answer (2)

Calvin cycle is seen in all plants.

120. Answer (2)

Methane forms around 50-70% of biogas.

121. Answer (4)

Mango belongs to family Anacardiaceae.

122. Answer (1)

A majority of animals and nearly all plants cannot maintain a constant internal environment. They are conformers and their body temperature changes with the ambient temperature.

123. Answer (2)

Smallest living organisms which lack cell wall are Mycoplasma.

124. Answer (4)

Desert lizards cope with extreme temperature by behavioural means.

125. Answer (4)

Gritty texture of pulp of fruits is due to presence of sclereids.

126. Answer (3)

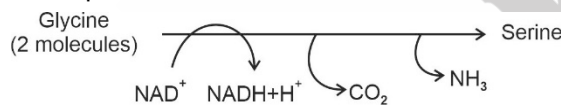
Key criteria for determining hotspot are high levels of species richness and high degree of endemism and threat.

127. Answer (3)

All tissues outside the vascular cambium constitute the bark.

All tissues below endodermis form stele.

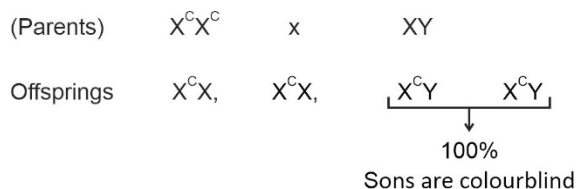
128. Answer (2)
Muliathi belongs to family Fabaceae.
Obliquely placed ovary and axile placentation is seen in members of Solanaceae.
Trilocular ovary is seen in members of Liliaceae.
129. Answer (3)
Pteridophytes are vascular cryptogams and have sporophyte as dominant plant body.
130. Answer (1)
Cytochrome c is a small protein attached to the outer surface of the inner membrane and acts as a mobile carrier for transfer of electrons between complex III and IV of ETS.
131. Answer (2)
Agar is obtained from *Gelidium* and *Gracilaria*.
132. Answer (3)
Each photosystem has all the pigments (except one molecule of chlorophyll a) forming a light harvesting system also called antennae.
Each photosystem has reaction centre and LHC.
133. Answer (2)
Auxin promotes root formation in stem cuttings.
134. Answer (1)
During photorespiration, decarboxylation reaction takes place in mitochondrion.



135. Answer (4)
Opuntia propagates vegetatively by aerial shoots.

SECTION - B

136. Answer (2)
Osmoregulation and excretion is regulated by contractile vacuole found in *Amoeba*.
137. Answer (2)
Parthenocarpic fruits are seedless fruits developed without fertilisation.
138. Answer (3)
Chlorophyll pigments are present in membrane of thylakoids.
139. Answer (4)



140. Answer (2)
The homologous chromosomes separate, while sister chromatids remain associated at their centromeres during anaphase-I.
Synaptonemal complex is formed during zygotene of prophase-I
141. Answer (4)
- | | | | | |
|------------|-------------|-----------|-----------|----|
| Parents | $I^A i$ | X | $I^B i$ | |
| Offsprings | $I^A I^B$, | $I^A i$, | $I^B i$, | ii |
| | AB | A | B | O |
142. Answer (1)
Equal weightage to vegetative and sexual characteristics was given to artificial system of classification.
143. Answer (1)
Lactose acts as an inducer and binds with repressor protein. This initiates the transcription of structural gene.
144. Answer (2)
Prions are abnormally folded proteins. Viroids are free RNA molecules and smaller than viruses.
Both of them are infectious.
145. Answer (3)
Virus free plants can be obtained from infected plant by meristem culture.
Lysine rich maize varieties developed in India are Protina, Shakti and Rattan.
146. Answer (2)
Onion has reduced disc shaped stem and leaves become fleshy to store food.
In ginger and turmeric, rhizome stores food. In potato, tuber stores food.
147. Answer (4)
Stratification is structural aspect of ecosystem.
148. Answer (2)
Vascular cambium is wavy and completely secondary in origin in dicot root. It is formed by dedifferentiation of cells of pericycle and conjunctive tissue.
149. Answer (4)
Disposal of the radioactive wastes is done about 500 m deep below earth's surface.
150. Answer (2)
Xylem vessels and tracheids are non-living conduits and are parts of apoplast.
Tracheids are found in all categories of vascular plants.

ZOOLOGY

SECTION - A

151. Answer (4)
Both smooth and skeletal muscle fibres are unbranched, lack intercalated discs and have actin and myosin filaments. However, smooth muscle fibres are non-striated while skeletal muscle fibres are striated in appearance.
152. Answer (4)
Mandible is an unpaired facial bone while all others are paired bones of the skull.
153. Answer (2)
Balanoglossus belongs to phylum Hemichordata. Its body is differentiated into anterior proboscis, middle collar and posterior trunk.
154. Answer (4)
Collagen is a protein found in ground substance of connective tissue. It is a heteropolymer of different amino acids.
155. Answer (4)
In human females, meiosis-I is complete at puberty.
156. Answer (4)
Rubber is polymeric substance.
Ricin, abrin are toxins and anthocyanin is a pigment. Amino acids are primary metabolites.
157. Answer (3)
Brachiosaurus: Early long necked plant eater (herbivore) and quadruped with a long tail.
Stegosaurus: Herbivore, plate backed and spikes at the end of the tail.
158. Answer (4)
First heart sound 'lub' is due to closure of tricuspid and bicuspid valves while second heart sound 'dub' is due to closure of semilunar valves.
159. Answer (1)
Binding of ATP with the head of myosin is associated with the breaking of cross bridge.
160. Answer (4)
Ileo-caecal valve prevents backflow of faecal matter from caecum to ileum.
Gastro-oesophageal sphincter regulates the opening of oesophagus while sphincter of Oddi guards the opening of hepato-pancreatic duct.
161. Answer (4)
Insertion at *Pvu* I site results in insertional inactivation of ampicillin resistance gene but tetracycline resistance gene remains intact.
162. Answer (3)
Secretions of seminal vesicles, prostate gland and bulbourethral glands together called seminal plasma, which contains certain enzymes, fructose and calcium. Seminal plasma along with sperms constitute semen.
163. Answer (3)
FRC = ERV + RV
FRC = 2100 – 2300 ml
164. Answer (4)
Malignant malaria caused by *P. falciparum* is the most serious one and can be fatal.
Sporozoites are stored in the salivary gland of female *Anopheles* mosquito.
165. Answer (2)
The inner part of cerebral hemispheres and group of associated deep structures like amygdala, hippocampus etc. to form complex structure called limbic system/lobe. It involves in the regulation of sexual behaviour and expression of emotional reactions along with hypothalamus.
166. Answer (3)
Increase in H⁺ ions decreases pH (acidic pH) and shift the oxygen dissociation curve to the right side.
167. Answer (4)
In MOET, a cow is administered hormones with FSH-like activity to induce superovulation. They produce 6-8 eggs per cycle.
The fertilized eggs at 8-32 cells stages are recovered non-surgically and transferred to surrogate mothers.
168. Answer (3)
Brain stem forms the connections between the brain and spinal cord. Three major regions make up the brain stem; midbrain, pons and medulla oblongata.
169. Answer (4)
Antennal gland or green gland perform excretory function in crustaceans e.g. Prawns.

170. Answer (2)

G6PD deficiency causes lysis of RBCs. Myosin ATPase is involved in muscle contraction.

171. Answer (4)

ANF (Atrial natriuretic factor) is secreted from the atrial wall of our heart.

Gastro-intestinal tract secretes four major peptide hormones, namely gastrin, secretin, CCK (cholecystokinin) and GIP (gastric inhibitory peptide).

172. Answer (4)

Loop of Henle is present in the medullary region of kidney.

173. Answer (2)

Plasmid is an autonomously replicating, closed circular, double stranded, extra chromosomal DNA.

174. Answer (4)

Snakes are limbless.

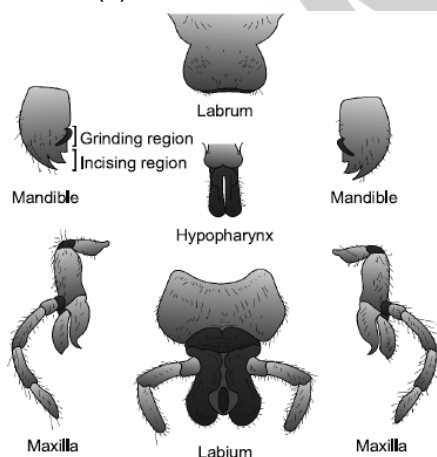
175. Answer (2)

Thymosin is produced from thymus gland and plays major role in the differentiation of T-lymphocytes.

176. Answer (3)

Ascariasis and filariasis	– Helminthic diseases
Common cold	– Viral disease
Amoebiasis	– Protozoan disease
Plague, diphtheria, dysentery	– Bacterial diseases

177. Answer (3)



178. Answer (4)

Bipolar neuron (with one axon and one dendrite found in retina of eye). Unipolar neuron-cell body with one axon only; found usually in the embryonic stage.

179. Answer (4)

C peptide is not present in mature insulin and is removed during maturation into insulin.

180. Answer (3)

In amphibians, development is indirect while in reptiles it is direct.

181. Answer (2)

Thyroid hormones are iodothyronines.

182. Answer (3)

Embryo upto 8 blastomeres are transferred into fallopian tube called ZIFT (Zygote Intra Fallopian Transfer).

Embryo with more than 8 blastomeres are transferred into uterus called IUT (Intrauterine transfer).

183. Answer (2)

Flightless birds lack functional wings.

184. Answer (1)

Genetic drift occurs in all population sizes, but effects are seen in small isolated population.

185. Answer (3)

LH surge triggers ovulation. Corpus luteum secretes progesterone which is essential for maintenance of endometrium.

SECTION - B

186. Answer (1)

Ascaris, spider and honeybees are unisexual organisms.

187. Answer (1)

In a protein structure, the last amino acid is called the C-terminal amino acid.

188. Answer (1)

Contraceptive methods = Average failure rate
(Annual pregnancies/100 woman)

Periodic abstinence = 20 – 30

Condoms = 10 – 15

IUDs = 6

189. Answer (4)

Cucumaria belongs to phylum Echinodermata. Most distinct feature is presence of water vascular system. Water canal system is present in sponges.

190. Answer (2)

Maltase is present in succus entericus.

191. Answer (4)

Cardiac muscle tissue cells are uninucleated.

192. Answer (3)

Glucocorticoids inhibit cellular uptake and utilisation of amino acids.

193. Answer (2)

Every 100 mL of oxygenated blood delivers around 5 mL of O₂ to the tissue, and every 100 mL of deoxygenated blood delivers about 4 mL of CO₂ to the alveoli.

194. Answer (1)

Receptors associated with aortic arch and carotid artery can recognise changes in CO₂ and H⁺ concentration.

195. Answer (4)

Fibrinogen, globulin and albumins are the major proteins present in blood plasma. Globulin is involved in defense mechanism and the albumin helps in osmotic balance of the body.

196. Answer (1)

P-wave represents depolarisation of the atria.

197. Answer (1)

Urine formation involves three main processes *i.e.*, filtration, reabsorption and secretion. Filtration is a non-selective process performed by the glomerulus.

198. Answer (3)

Fibrous joint do not allow any movement. It is shown by the flat skull bones. Synovial joints allow considerable movements.

199. Answer (3)

Cannabinoids are group of chemical which interact with cannabinoid receptors present principally in the brain.

200. Answer (2)

Analogous structures are anatomically different though they perform similar functions. Different structures evolving for the same functions and hence having similarity.

□ □ □



Aakashi
+ BYJU'S