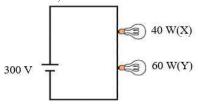


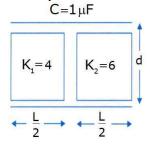
Physics - Section A

Section A Shall Consist Of 35 (Thirty-five) Questions In Each Subject .All Questions Are Compulsory.

- 1. The potential difference in open circuit for a cell is 2.2 volts. When a 4 ohm resistor is connected between its two electrodes the potential difference becomes 2 volts. The internal resistance of the cell will be-
 - (1) 1 ohm
- (2) 0.2 ohm
- (3) 2.5 ohm
- (4) 0.4 ohm
- 2. Two bulbs X and Y having same voltage rating and of power 40 watt and 60 watt respectively are connected in series across a potential difference of 300 volt, then

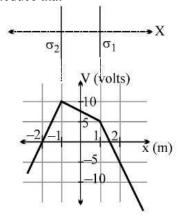


- (1) X will glow brighter
- (2) Resistance of Y is greater than X
- (3) Heat produced in Y will be greater than X
- (4) Y will glow brighter
- **3.** A capacitor of capacitance 1 μ F is filled with two dielectrics of dielectric constants 4 and 6. What is the new capacitance?

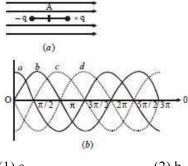


- (1) 10 μ F
- (2) 5 μ F
- (3) $4 \mu F$
- (4) None of these

4. The figure to the right shows the potential due to two likely charged infinite sheets with charge per unit area σ_1 and σ_2 . From examining this plot we can deduce that



- $(1) \sigma_2 > \sigma_1$
- (2) $\sigma_2 < \sigma_1$
- (3) $\sigma_2 = \sigma_1$
- (4) none of these
- 5. The electric dipole is situated in an electric field as shown in figure. The dipole and electric field are both in the plane of paper. The dipole is rotated about an axis perpendicular to the paper at point A in anticlockwise direction. If the angle of rotation is measured with respect to the direction of the electric field, then the torque require to hold the dipole at rest for different values of the angle of rotation θ will be as represented in fig. (b).



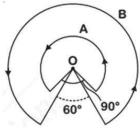
(1) a

(2) b

(3) c

(4) d

A wire A, bent in the shape of an arc of a circle, carrying a current of 2A and having radius 2 cm and another wire B, also bent in the shape of arc of a circle, carrying a current of 3 A and having radius of 4 cm, are placed as shown in the figure. The ratio of the magnetic field due to the wires A and B at the common centre O is:

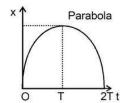


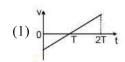
(1)2:5

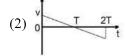
(2)6:5

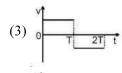
(3)6:4

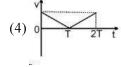
- (4)4:6
- The v-t graph of the particle is correctly shown by



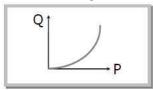




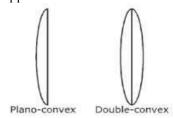




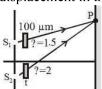
The graph shows the behaviour of a length of wire in the region for which the substance obeys Hooke's law. P and Q represent



- (1) P = applied force, Q = extension
- (2) P = extension, Q = applied force
- (3) P = extension, Q = stored elastic energy
- (4) P = stored elastic energy, Q = extension
- You are given two thin identical plano-convex lenses, one of which is shown to the right. When you place an object 20 cm to the left of a single plano-convex lens, the image appears 40 cm to the right of the lens. You then arrange the two plano-convex lenses back to back to form a double convex lens. If the object is at 20 cm to the left of this new lens, what is the approximate location of the image?

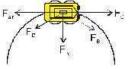


- (1) 6. 7 cm to the right of the lens
- (2) $10~\mathrm{cm}$ to the right of the lens
- (3) 20 cm to the right of the lens
- (4) 80 cm to the right of the lens
- 10. In a Young's double slit experiment, a sheet of thickness $100 \, \mu \text{m}$ and refractive index 1.5 is introduced as shown in the figure. A sheet of thickness t and refractive index 2 is introduced in lower ray's path. It is observed that there is no displacement in the fringes. The value of t is



- (1) $100 \mu m$
- (2) $200 \mu m$
- (3) 150 μ m
- (4) $50 \mu m$

11. A car travels with constant speed on a circular road on ground level. In the figure shown, F_{air} is the force of air resistance on the car. Which of the other forces best represents the horizontal force of the road on the car's tires?



 $(1) F_A$

 $(2) F_B$

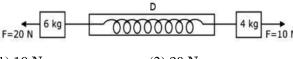
 $(3) F_{\rm C}$

- $(4) F_D$
- **12.** Above neutral temperature, thermo emf in a thermocouple:
 - (1) decreases with rise in temperature
 - (2) increases with rise in temperature
 - (3) remains constant
 - (4) changes sign
- 13. The elastic relaxation time is minimum for :-
 - (1) glass
- (2) quartz
- (3) rubber
- (4) clay
- **14.** Two mass A and B, each of mass m, are initially in equilibrium as shown in figure. The acceleration of block A just after string between A and B is cut will be: (g = acceleration due to gravity)



- (1) 2g downward
- (2) 2g upward
- (3) g downward
- (4) g upward

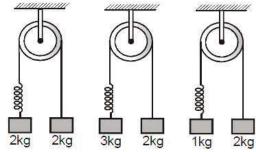
15. A dynamometer D, which is a device used to measure force, is attached to two blocks of masses 6 kg and 4 kg. Forces of 20 N and 10 N are applied on the blocks as shown in the figure. The reading of the dynamometer is



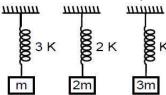
- (1) 10 N
- (2) 20 N

(3) 6 N

- (4) 14 N
- **16.** Same spring is attached with 2 kg, 3 kg and 1 kg blocks in three different cases as shown in figure. If \mathbf{x}_1 , \mathbf{x}_2 and \mathbf{x}_3 be the extensions in the spring in these three cases, then:

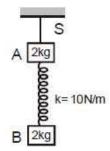


- (1) $\mathbf{x}_1 = 0, \mathbf{x}_3 > \mathbf{x}_2$
- (2) $x_2 > x_1 > x_3$
- $(3) x_3 > x_1 > x_2$
- $(4) x_1 > x_2 > x_3$
- **17.** Three blocks attached to three different springs are in equilibrium as shown. Ratio of the spring force acting on the blocks of mass m, 2m and 3m respectively are



- (1) 3 : 4 : 3
- (2) 3:1:3
- (3) 1:2:3
- $(4)\ 3:2:1$

18. The system shown in figure is in equilibrium. The spring is light, the acceleration of both the blocks (in m/s²) just after the string S is cut is -



- (1) $a_A = 10$, $a_B = 0$ (2) $a_A = 0$, $a_B = 10$ (3) $a_A = 20$, $a_B = 0$ (4) $a_A = 0$, $a_B = 20$

- 19. Preeti reached the metro station and found that the escalator was not working. She walked up the stationary escalator in time t₁. On other days, if she remains stationary on the moving escalator, then the escalator takes her up in time t_2 . The time taken by her to walk up on the moving escalator will be

- 20. Equal masses of H₂ and O₂ gases are filled in two vessels A and B at the same temperature. The volume of vessel A is half that of B. Which of the following statements is correct? (P-pressure $< E_k >$ Average KE, (C_{rms}) - RMS velocity)
 - (1) $P_A = P_B$
 - $(2) (C_{rms})_A = (C_{rms})_B$
 - $(3) < E_k >_A = < E_k >_B$
 - (4) All
- **21**. The internal energy (U), pressure (P) and volume (V) of an ideal gas are related as U = 3PV + 4. The gas is
 - (1) polyatomic only
 - (2) monoatomic only
 - (3) either monoatomic or diatomic
 - (4) diatomic only.

- 22. Initial pressure and volume of a gas are P and V respectively. First its volume is expanded to 4V by isothermal process and then again its volume makes to be V by adiabatic process then its final pressure is $(\gamma = 1.5)$
 - (1) 8P

(2) 4P

(3) P

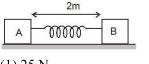
- (4) 2P
- 23. The efficiency of an ideal heat engine working between the freezing point and boiling point of water,
 - (1) 6.25%
- (2) 20%
- (3) 26.8%
- (4) 12.5%
- **24.** A man runs towards the plane mirror at 2 ms^{-1} . The relative speed of his image w.r.t. him will be
 - $(1) 2 \,\mathrm{ms}^{-1}$
- $(2) 4 \,\mathrm{ms}^{-1}$
- $(3) 8 \, \text{ms}^{-1}$
- $(4)\ 10\ \mathrm{ms^{-1}}$
- 25. A ray of light incident at a certain angle on a refracting face of a prism, emerges from the other face normally. If the angle of prism is 3° and prism is made of a material of refractive, index 1.63, the angle of incidence is approximately
 - $(1) 6.0^{\circ}$
- $(2) 4.9^{\circ}$
- $(3) 7.5^{\circ}$
- $(4) 3.5^{\circ}$
- **26.** Tyndall effect in colloidal solution is due to
 - (1) Scattering of light
 - (2) Reflection of light
 - (3) Absorption of light
 - (4) Presence of electrically charged particles
- 27. A presbyopic patient has near point as 30 cm and far point as 40 cm. The dioptric power for the corrected lens for seeing distant objects is:
 - (1) 40
- (2) 4
- (3)-2.5
- (4) 0.25
- 28. A plano-convex lens with a radius of curvature R, is lying on a reflecting plane surface such that the convex part of the lens is in contact with the plane surface. The lens is illuminated from above. The shape of interference fringes is :-
 - (1) circular
- (2) hyperbolic
- (3) elliptical
- (4) parabolic

- 29. Consider the diffraction pattern obtained from the sunlight incident on a pinhole of diameter 0.1 µm. If the diameter of the pinhole is slightly increased, it will affect the diffraction pattern such that:
 - (1) its size decreases, but intensity increases
 - (2) its size increases, but intensity decreases
 - (3) its size increases, and intensity increases
 - (4) its size decreases, and intensity decreases
- 30. The motion of a particle executing S.H.M. is given by $x = 0.01 \sin (100\pi t + \pi/3)$, where x is in meters and time is in seconds. The time period is
 - (1) 0.01 sec
- (2) 0.02 sec
- (3) 0.1 sec
- (4) 0.2 sec
- **31.** A string of length 2 m is fixed at both ends. If this string vibrates in its fourth normal mode with a frequency of 500 Hz then the waves would travel on it is with a velocity of.
 - (1) 125 m/s
- (2) 250 m/s
- (3) 500 m/s
- $(4)\ 1000\ m/s$

- 32. When a body starts to roll on an inclined plane, its potential energy is converted into:
 - (1) Translational kinetic energy only
 - (2) Translational and rotational kinetic energy
 - (3) Rotational energy only
 - (4) None of these
- 33. At a height above the surface of the earth equal to the radius of the earth, the value of g' will be:
 - (1) Zero
- (2) \sqrt{g} (4) $\frac{g}{2}$

 $(3) \frac{g}{4}$

- **34.** Two ordinary satellites are revolving round the earth in same elliptical orbit, then which of the following quantities is conserved:-
 - (1) velocity
- (2) angular velocity
- (3) Angular momentum
- (4) none of above
- **35.** Two blocks are connected by a spring of natural length 2 m. The force constant of spring is 200 N/m. Find spring force in following situations. If block 'A' and 'B' both are displaced by 0.5 m in same direction.



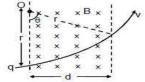
- (1) 25 N
- (2) 100 N
- (3) 30 N

(4) Zero

Physics - Section B

Section B Shall Consist Of 15 (Fifteen) Questions In Each Subject. Candidate Needs To Attempt Any 10 (Ten) Questions Out Of 15 (Fifteen) In Each Subject.

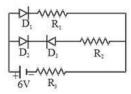
36. A charge particle q enters in a region of uniform magnetic field normally and exits from the other end of the magnetic field space. The deflection of the charge particle in magnetic field is



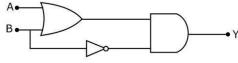
- (1) $\theta = \cos^{-1}\left(\frac{dqB}{mv}\right)$ (2) $\theta = \cos^{-1}\left(\frac{dqB}{2mv}\right)$ (3) $\theta = \sin^{-1}\left(\frac{dqB}{mv}\right)$ (4) $\theta = \sin^{-1}\left(\frac{dqB}{2mv}\right)$

- **37.** A charge Q is situated at the center of a cube, the electric flux passed through all the six faces of the cube is-

38. Figure shows a circuit in which three identical diodes are used. Each diode has forward resistance of 20 Ω and infinite backward resistance. Resistors $R_1 = R_2 =$ $R_3 = 50 \Omega$. Battery voltage is 6 V. The current through R3 is:



- $(1) 60 \, \text{mA}$
- (2) 100 mA
- (3) 50 mA
- (4) 25 mA
- **39.** A galvanometer can be changed into ammeter by connecting:
 - (1) high resistance in parallel
 - (2) high resistance in series.
 - (3) low resistance in parallel
 - (4) low resistance in series
- **40**. The output for the given, circuit is



- $(1) (A + B) \cdot \overline{B}$
- (2) (A. B). \overline{B}
- $(3)(A+B)\cdot B$
- $(4)(A \cdot B) + B$
- **41.** A small sphere is hang with a string of length ℓ , this sphere moves in a horizontal circular path making an angle θ with vertical then its time period is -

(1)
$$T=2\pi\sqrt{rac{\ell}{g}}$$

(2) T =
$$2\pi\sqrt{\frac{\ell\sin\theta}{g}}$$

(3)
$$T = 2\pi \sqrt{\frac{\ell \cos \theta}{g}}$$

$$(1) T = 2\pi \sqrt{\frac{\ell}{g}}$$

$$(2) T = 2\pi \sqrt{\frac{\ell \sin \theta}{g}}$$

$$(3) T = 2\pi \sqrt{\frac{\ell \cos \theta}{g}}$$

$$(4) T = 2\pi \sqrt{\frac{\ell}{g \cos \theta}}$$

- **42.** If the de-Broglie wavelength for a proton and for a α particle are equal, then the ratio of their velocities will be:
 - (1)4:1
- (2) 2 : 1
- (3) 1 : 2
- (4) 1 : 4

43. An X-ray tube produces a continuous spectrum of radiation with a cutoff wavelength of 45×10^{-3} nm. The maximum energy of a photon in the radiation (in

$$[\mathrm{h} = 6.62 \times 10^{-34} \ \mathrm{J \ s, c} = 3 \times 10^8 \ \mathrm{m \ s^{-1}}]$$

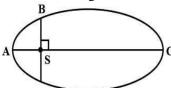
- (1)27500
- (2) 22500
- (3) 17500
- (4) 12500
- **44.** Which of the following represents the γ -decay?

$$\begin{array}{c} (1) \\ {}^{A}X_{Z} + {}^{1}n_{0} = {}^{A-3}X_{Z-2} + {}^{A}X_{Z} + \gamma = {}^{A}X_{Z-1} + a + 1 \\ (3) {}^{A}X_{Z} = {}^{A}X_{Z} + f \\ \end{array}$$

45. Identify the missing product in the given nuclear reaction

$$^{235}_{92}\mathrm{U} + ^{1}_{0}\mathrm{n} \rightarrow ? + ^{92}_{36}\mathrm{Kr} + 3^{1}_{0}\mathrm{n}$$

- (1) ${}^{141}_{56}$ Ba (2) ${}^{139}_{56}$ Ba (3) ${}^{139}_{54}$ Ba (4) ${}^{141}_{54}$ Ba
- 46. The kinetic energies of a planet in an elliptical orbit about the Sun, at positions A, B and C are K_{A'} K_B and K_C, respectively. AC is the major axis and SB is perpendicular to AC at the position of the Sun S as shown in the figure. Then



- $(1) \, K_B < K_A < K_C \qquad \quad (2) \, K_A > K_B > K_C$
- (3) $K_A < K_B < K_C$ (4) $K_B > K_A > K_C$
- 47. A wire of length 2 m is moving with a velocity of 1 m/s normal to a magnetic field of 0.5 Wb/m^2 .

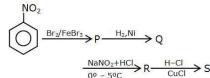
The emf induced in it will be - $\left(\stackrel{\rightarrow}{\ell} \perp \stackrel{\rightarrow}{B}\right)$

- (1) 0.5 V
- (2) 0.1 V
- (3) 2 V
- (4) 1 V
- 48. The distance between the ends of wings of an aeroplane is 5m. The aeroplane is moving with velocity of 200 km / sec in a magnetic field of 10T. The emf induced across the ends of wings will be:
 - $(1) 10^7 \text{ volt}$
- (2) 10 volt
- $(3) 10^6 \text{ volt}$
- (4) none of these

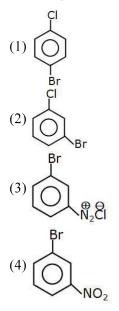
Chemistry - Section A

Section A Shall Consist Of 35 (Thirty-five) Questions In Each Subject .All Questions Are Compulsory.

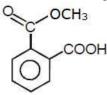
51. Consider the following reactions-



The end product 'S' is-



52. Correct name for given compound is-



- (1) Aspirin
- (2) Acetylsalicylic acid
- (3) 2-methoxy carbonyl benzoic acid
- (4) All
- **53.** Consider 0.2 M aqueous solutions of (a) NaCl (b) BaCl₂ (c) Sugar

The relative lowering of vapour pressure will be such that -

- (1) b > a > c
- (2) b > c > a
- (3) a > b > c
- (4) c > a > b

- **54.** An open beaker of water in equilibrium with water vapour is in a sealed container. When a few grams of glucose are added to the beaker of water, the rate at which water molecules-
 - (1) leaves the vapour increases
 - (2) leaves the solution increases
 - (3) leaves the vapour decreases
 - (4) leaves the solution decreases
- **55.** K_{sp} of a CaSO₄.5H₂O is 9×10^{-6} Find the volume of CaSO₄ for 1 gm (M_{w} = 136)-
 - (1) 2.45 litre
- (2) 5.1 litre
- (3) 4.52 litre
- (4) 3.2 litre
- **56.** The electrolysis of a solution resulting in the formation of H_2 at the cathode and Cl_2 at the anode. The liquid is-
 - (1) Pure water
- (2) H₂SO₄ solution
- (3) NaCl solution in water (4) CuCl₂ solution in water
- **57.** Consider the following reactions at 300 K.

 $A \rightarrow B$ (uncatalyzed reaction)

 $A \xrightarrow{Catalyst} B(catalyst reaction)$

The activation energy is lowered by 8.314 KJmol^{-1} for the catalyzed reaction. How many times the rate of this catalyzed reaction greater than that of uncatalyzed reaction? (Given $e^{3.33} = 28$)

- (1) 15 times
- (2) 38 times
- (3) 22 times
- (4) 28 times
- **58.** The number of Cl⁻ ions around one Na⁺ in NaCl crystal lattice is-
 - (1) 12
- (2)4
- (3) 8
- (4)6
- **59.** The nature of charge on resulting colloidal particles when FeCl₃ is added to excess of hot water is:
 - (1) positive
 - (2) neutral
 - (3) sometimes positive and sometimes negative
 - (4) negative

- **60.** As_2S_3 sol is-
 - (1) positive colloid
- (2) negative colloid
- (3) neutral colloid
- (4) none of these
- **61**. The equation:
 - $2Al(S) + \frac{3}{2}O_2(g) \rightarrow Al_2O_3(s)$ shows that
 - (1) 2 mole of Al reacts with $\frac{3}{2}$ mole of O_2 to produce $\frac{7}{2}$ mole of Al₂O₃
 - (2) 2 gm of Al reacts with $\frac{3}{2}$ g of O₂ to produce one mole of Al₂O₃
 - (3) 2 gm mole of Al reacts with $\frac{3}{2}$ lite of O_2 to produce 1 mole of Al₂O₃
 - (4) 2 mole of Al reacts with $\frac{3}{2}$ mole of O₂ to produce 1 mole of Al₂O₃
- **62.** The wavelength (in cm) of second line in the Lyman series of hydrogen atomic spectrum is: (Rydberg constant = $R \text{ cm}^{-1}$)-

- 63. The correct order of liquification of the gases NH₃, CO_2 , SO_2 and HCl is-
 - (1) $NH_3 > CO_2 > HC1 > SO_2$
 - (2) $CO_2 > NH_3 > SO_2 > HC1$
 - (3) $HC1 > CO_2 > NH_3 > SO_2$
 - (4) $SO_2 > NH_3 > HCl > CO_2$
- **64.** For the reaction $N_{2(g)} + O_{2(g)} \rightleftharpoons 2NO_{(g)}$, $\Delta H > 0$. The concentration of NO(g) in the reaction at equilibrium is increased when-
 - (1) temperature is increased
 - (2) temperature is decreased
 - (3) inert gas is introduced in the container
 - (4) a catalyst is introduced
- 65. At constant volume 1150 kcal heat is released when following reaction is carried out at 27°C. $C_7H_{16}(l) + 11O_2(g) \rightarrow 7CO_2(g) + 8H_2O(l)$ The heat change at constant pressure is-
 - (1)-1152.4 Kcal
- (2) -1116.2 Kcal
- (3) -1167.4 Kcal
- (4) -1150.17 Kcal

- 66. How many mole of K₂Cr₂O₇ can be reduced by 1 mole of Sn^{2+} ?
 - $(1) \frac{1}{3}$ $(3) \frac{2}{3}$

 $(2)\frac{1}{6}$

- (4) 1
- **67.** Which of the following reactions will not result in the formation of carbon-carbon bonds?
 - (1) Reimer-Tieman reaction
 - (2) Cannizaro reaction
 - (3) Wurtz reaction
 - (4) Friedel-Crafts acylation

68.
$$CH_3 - CH_2 - CHCl_2 \xrightarrow{NaNH_2} P \xrightarrow{CH_3-I} Q; Q \text{ is-}$$

- (1) $CH_3 CH_2 C \equiv CH$
- $(2) CH_3 CH_2 C \equiv C CH_3$
- (3) $CH_3 C \equiv C CH_3$
- (4) $CH_3 C \equiv CH$
- 69. The correct order of reactivity of PhMgBr with the following compounds will be-

$$(C_6H_5)_2CO, CH_3 - CH = O, (CH_3)_2C = O$$
(1) (3)

- (1) 1 > 2 > 3
- (2) 2 > 3 > 1
- (3) 3 > 2 > 1
- (4) 1 > 3 > 2
- 70. To which of the following compound HI adds most readily?
 - (1) $CH_3 CH = CH CH_3$
 - (2) $CH_3 C \equiv CH$

$$(3) \begin{array}{c} CH_3 - C = CH - CH_3 \\ I \\ CH_3 \end{array}$$

- $(4) CH_2 = CH_2$
- 71. Dehydration of alcohol to alkene by heating with conc. H₂SO₄, the initiation step is _____ followed with _____ mechanism-
 - (1) Elimination of water, free radical
 - (2) Formation of an ester, free radical
 - (3) Protonation of alcohol, carbocation
 - (4) Protonation of alcohol, carbanion

- **72.** Which of the following compounds does not react with NaHSO₃?
 - $(1) C_6 H_5 CHO$
- (2) C₆H₅COCH₃
- (3) CH₃COCH₃
- (4) C₂H₅COCH₃
- 73. Compound A gives D-Galactose and D-Glucose on hydrolysis. The compound A is-
 - (1) Lactose
- (2) Amylose
- (3) Sucrose
- (4) Maltose
- **74.** Which of the following process/step not involved in the extraction of silver?
 - (2) Reduction by Zinc
 - (1) Hyrometallurgy
- metal
- (3) Formation of
- $[Ag(CN_2)]^-$
- (4) Electrolytic reduction
- **75.** $CH_3 C CH_3 + \xrightarrow{PhMgBr} A \xrightarrow{H_3O^+} B \xrightarrow{H_3PO_4} C$

Compound C is-

(1)
$$Ph - C - CH_3$$
 $||$
 O
 CH_3
 $|$
(2) $Ph - C - CH_3$
 OH
 OH
 OH
 OH

$$(4) Ph - CH = CH_3$$

- **76.** Heating of ore in presence of air to remove sulphur impurities is called-
 - (1) Calcination
- (2) Roasting
- (3) Smelting
- (4) None
- **77.** Ammonium compound which on heating does not give NH₃ is-
 - $(1) (NH_4)_2SO_4$
- $(2) (NH_4)_2CO_3$
- (3) NH₄NO₂
- (4) NH₄Cl

- **78.** Of the following, which one is a correct statement-
 - (1) Ionic radius of a metal is same as its atomic radius
 - (2) The ionoc radius of a metal greater than its atomic radius
 - (3) The atomic radius of a non-metal is more than its ionic radius
 - (4) The ionic radius of a metal is less than its atomic radius
- **79.** Match List I with List-II

	List-I		List-II
(a)	PCl ₅	(i)	Square pyramidal
(b)	SF ₆	(ii)	Trigonal planar
(c)	BrF ₅	(iii)	Octahedral
(d)	BF ₃	(iv)	Trigonal bipyramidal

Choose the correct answer from the options given below-

- (1) (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)
- (2) (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)
- (3) (a)-(ii), (b)-(iii), (c)-(iv), (d)-(i)
- (4) (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)
- **80.** The correct order of C–O bond length among CO, CO_3^{-2} , CO_2 is-
 - (1) $CO < CO_3^{-2} < CO_2$
 - (2) $CO_3^{-2} < CO_2 < CO$ (3) $CO < CO_2 < CO_3^{-2}$

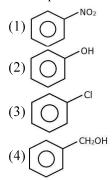
 - (4) $CO_2 < CO < CO_3^{-2}$
- **81** Which of the following compound of Xe disproportionate on hydrolysis?
 - $(1) \text{ XeF}_2$
- $(2) XeF_4$
- $(3) XeF_6$
- (4) All of these
- 82. Compound of a metal 'M' is M₂O₃. The formula of its nitride will be -
 - $(1) M_3N$
- (2) MN
- $(3) M_3 N_2$
- $(4) M_2N_3$
- 83. Maximum number of unpaired electrons are present

- (1) B_2^+ (2) O_2 (3) O_2^- (4) O_2^{2-}
- 84. Calamine is an ore of-
 - (1) Zn
- (2) Mg
- (3) Ca
- (4) Pb

Chemistry - Section B

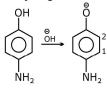
Section B Shall Consist Of 15 (Fifteen) Questions In Each Subject. Candidate Needs To Attempt Any 10 (Ten) Questions Out Of 15 (Fifteen) In Each Subject.

86. Which one of the following is most reactive towards electrophilic attack?



87. Consider p—amino phenol :-

Which position(s) is/are mainly coupling reaction in basic medium?



- (1) 1-position
- (2) 2-position
- (3) Both 1-and 2-position
- (4) None is correct
- **88.** At 25°C, the vapour pressure of pure liquid A (mol. wt. = 40) is 100 torr, while that of pure liquid B is 40 torr, (mol. wt. = 80). The vapour pressure at 25°C of a solution containing 20 g of each A and B is-
 - (1) 80 torr
- (2) 59.8 torr
- (3) 68 torr
- (4) 48 torr
- **89.** K_a for CH₃COOH is 10^{-5} and K_b for NH₄OH is 10^{-5} . The pH value of ammonium acetate will be-
 - (1) 10

(2)5

(3)7

(4)7.5

- **90.** The value of \wedge_m^{∞} for NH₄Cl, NaOH and NaCl are 129.8, 248.1 and 126.4 ohm⁻¹ cm² mol⁻¹ respectively. Calculate \wedge_m^{∞} for NH₄OH solution (in $ohm^{-1} cm^2 mol^{-1}$
 - (1)215.5
- (2) 251.5
- (3) 244.7
- (4)351.5
- **91** Concentration of the reactant in first-order is reduce to $\frac{1}{e^2}$ after (Natural life = $\frac{1}{K}$)

 - (1) one natural life-time (2) two-natural life-time

 - (3) three natural life-time (4) four natural life-time
- 92. In a ccp structure, the-
 - (1) first and third layers are repeated
 - (2) first and fourth layers are repeated
 - (3) second and fourth layers are repeated
 - (4) first, third and sixth layers are repeated
- **93.** If the planck's constant $h = 6.6 \times 10^{-34}$ Js, the de-Broglie wavelength of a particle having momentum of $3.3 \times 10^{-24} \text{ kg.m.s}^{-1} \text{ will be-}$
 - (1) 0.002 Å
- (2) 0.02 Å
- (3) 0.2 Å
- (4) 2 Å
- **94.** Increase in the pressure for the following equilibrium, $H_2O(1) \rightleftharpoons H_2O(g)$

result in the

I : Formation of more $H_2O(1)$

II: Formation of more $H_2O(g)$

III: Increase in boiling point of H₂O(l)

IV: Decrease in boiling point of $H_2O(1)$

Hence, correct statements are -

(1) I, II

- (2) II, III
- (3) I, III
- (4) I, IV

- **95.** The enthalpy of formation for $C_2H_4(g)$, $CO_2(g)$ and $H_2O(1)$ at 25°C and 1 atm pressure are 52, -394 and -286 kJ mol⁻¹ respectively. The enthalpy of combustion of C₂H₄ will be-
 - $(1) + 1412 \text{ kJ mole}^{-1}$
 - $(2) 1412 \text{ kJ mole}^{-1}$
 - $(3) + 142.2 \text{ kJ mole}^{-1}$
 - $(4) 141.2 \text{ kJ mole}^{-1}$
- **96.** $xCr_2 O_7^{2-} + ySO_{2(\,g)} \longrightarrow Cr_{(aq)}^{3+} + SO_4^{2-}$ the x and y respectively in the above reaction-
 - (1) 1, 3

(2) 2, 3

(3)3,4

- (4) 4, 5
- **97.** Which one is correctly matched?
 - (1)

Metal	Refining Process
Ti	Zone refining

(2)

Metal	Refining Process
Ni	Van Arkel method

(3)

(4)

Metal	Refining Process
Sn	Liquation

- 98. Which of the following properties given in pair are shown by nitric acid?
 - (1) Bleaching and

oxidising

(2) Acidic and oxidising

(3) Reducing and

(4) Bleaching and

oxidising

- reducing
- 99. When sodium metal is dissolved in liquid ammonia, a blue solution is formed. The blue color is due to-
 - (1) Solvated Na⁺ ions
- (2) Solvated electrons
- (3) Solvated NH₂⁻ ions
- (4) Solvated protons
- **100.** In the dichromate anion $(\operatorname{Cr}_2 \operatorname{O}_7^{2-})$ -
 - (1) all C—O bonds are equivalent
 - (2) 6 Cr—O bonds are equivalent
 - (3) 3 Cr—O bonds are equivalent
 - (4) no bonds in $\operatorname{Cr}_2 \operatorname{O}_7^{2-}$ are equivalent

Botany - Section A

Section A Shall Consist Of 35 (Thirty-five) Questions In Each Subject .All Questions Are Compulsory.

101. Identify the parts labelled P, Q, R and S, and select the **right** option about them.



Option	Part-[P]	Part-[Q]	Part-[R]	Part-[S]
(a)	Epidermis	Endothecium	Microspore mother cells	Middle layer
(b)	Epidermis	Endothecium	Middle layer	Microspore mother cells
(c)	Endothecium	Epidermis	Microspore mother cells	Middle layer
(d)	Endothecium	Epidermis	Middle layer	Microspore mother cells

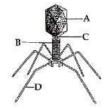
(1)a

(2) b

(3)c

(4) d

- 102. The protein coat of virus is called
 - (1) Capsid
- (2) Cosmid
- (3) Capsomere
- (4) Chromophore



(1)

A	В	C	D	
Sheath	Collar	Head	Tail fibres	

(2)				
A	В	C	D	
Head	Sheath	Collar	Tail fibres	
(3)				

(3) A

Collar Tail fibres		Head	Sheath	
(4)				
A	В	C	D	
Tail fibres	Head	Sheath	Collar	

104. Which one is referred to as soluble RNA?

- (1) mRNA
- (2) tRNA
- (3) rRNA
- (4) ssRNA

105. Which of the following is incorrect for reproduction?

- (1) Unicellular organisms reproduce by cell division
- (2) Reproduction is a characteristic of all living organisms
- (3) In unicellular organisms, reproduction and growth are linked together
- (4) Non-living objects are incapable of reproducing

106. During binary fission the cell division is

- (1) Mitosis
- (2) Meiosis
- (3) Amitosis
- (4) Cytokinesis

107.Bryophyllum and kalanchoe are vegetatively propagated through

- (1) Leaves
- (2) Adventitious buds
- (3) Underground stems
- (4) Prostate stems

108. In which type of flowers, stigma is rough and sticky

- (1) Insect pollinated
- (2) Wind pollinated
- (3) Water pollinated
- (4) All the above

109. Cotyledon of maize grain is called:

- (1) plumule
- (2) coleorhiza
- (3) coleoptile
- (4) scutellum

110. Which one of the following is linked to the discovery of Bordeaux mixture as a popular fungicide?

- (1) Loose smut of wheat
- (2) Black rust of wheat
- (3) Bacterial leaf blight of rice
- (4) Downy mildew of grapes

111. Water channels are possessed by a membrane to facilitate the movement of hydrophilic substances. These channels are made up of :-

- (1) Eight similar types of aquaporin
- (2) Eight different types of aquaporin
- (3) Porin proteins
- (4) None of the above

112.The rate of transpiration will be very less in a situation where-

- (1) Environment is very hot and dry
- (2) Relative humidity is very high
- (3) Ground water is sufficiently available
- (4) Wind is blowing with a very high velocity

113.Read the following statement and select the **correct** option factor affecting photosynthesis.

- (1) C_3 plants respond to higher temperature and shows higher rate of photosynthesis
- (2) Water stress never makes leave wilt, but reduces the suface area of the leaves.
- (3) Current availability of CO_2 levels is not limiting to the C_3 plants
- (4) Saturation occurs at 10 per cent of the full sunlight.

114. During photosynthesis:-

(1)

Both CO₂ and water get oxidized

(2)

Both CO₂ and water get reduced

(3)

CO₂ gets oxidised, water gets reduced

(4)

CO₂ gets reduced, water gets oxidised

115.Oxygenic photosynth	esis occurs in :-	122. Pyramid of numbers	s is
(1) Oscillatoria (2) Rhodospirillum		(1) Always upright	
(3) Chlorobium (4) Chromatium		(2) Always inverted	
		(3) Either upright or	·inverted
116. The incomplete Oxidation of food during fermentation does not involves :-		(4) Neither upright r	nor inverted.
(1) Glycolysis		123. The term "The evil of	quartet" is related with four major
(2) Oxidation of NAI	OH_2	causes of	
(3) Oxidation of redu	ced coenzymes in mitochondria	(1) forest loss	(2) population explosion
(4) Reduction of NA)	(3) air pollution	(4) biodiversity losses
	produced during the production	124. Catalytic converter i	is used to control :-
	cetyl CoA from 1 molecule of	(1) Particulate matte	er
Pyruvic acid is:	(2) 0 4770	(2) Carbon monoxid	le and nitrogen oxides
(1) 3 ATP	(2) 8 ATP	(3) High noise level	
(3) 36 ATP	(4) 38 ATP	(4) Solid wastes	
118. Which of the following pair is mismatched? (1) Spinach — LDP (2) Zea mays — DNP		125. Use of DDT as pesticide in high concentrations eventually caused significant decline in bird	
******		(1) Is a biodegradab	le pollutant
	lowing population interactions is cal science for the production of	(2) Caused thinning of egg shell and their premature breaking(3) Increased calcium absorption in birds	
(1) Parasitism	(2) Mutualism	` '	ological magnification
(3) Commensalism	(4) Amensalism	(4) Did not show the	Siogical magnification
• •	. ,	126. Read the following s	statements:
120. A sedentary sea aner lining of hermit crab.	mone gets attachted to the shell The association is	(i) Long thin flexible petioles alow leaf blades to flutter in wind, thereby cooling the leaf and bringing	
(1) ectoparasitism	(2) symbiosis	fresh air to leaf surfa	
(3) commensalism	(4) amensalism	(ii) Leaf lamina lack (iii) Veins provide ri	
121. Consider the following four statements (a-d) and select option which includes all correct ones only:- (a) Plants capture 1-5% of incident solar radiation		(iv) Leaf possess ret (v) The axil of leafle	ciculate or parallel venation ets possess many axillary buds pove statements are correct?
	not exempted from laws of	(1) Three	(2) Two
thermodynamics		(3) One	(4) Five
	erbivores in terrestrial ecosystem	D 12 11 1 12 1	d 1
are insects, birds and (d) flow of energy is		127. Pedicellate bisexual flowers borne acropetally on an elongated peduncle form an inflorescence called	
(a) now or energy is	mandancenonai	eloligated pedulicle	torm an innorescence caned

(1) Spike

(3) Raceme

(2) Corymb

(4) Catkin

(2) Statement a,b,c

(4) Statement c,d

(1) Statement b,c

(3) Statement b,c,d

- **128.** The innermost layer of cortex in a dicot root:
 - (1) Comprises a single layer of barrel shaped cells without any intercellular spaces
 - (2) Are composed of cells which have depositions of impermeable cutin and lignin mainly in their radial and tangential walls
 - (3) Comprises a group of dead cells
 - (4) Contain abundant intercellular spaces
- 129. Which one is true for the tissue which constitutes the hypodermis of dicot stem?
 - (1) It is found either collenchymatous or sclenchymatous
 - (2) It consists of cells which are much thickened at the corners due to deposition of cellulose, hemicelluloses and lignin
 - (3) The cells are never photosynthetic
 - (4) Intercellular spaces are abundantly present
- 130 Mendel selected Pisum sativum for hybridisation experiments because of
 - (1) Clear contrasting characters and short life span
 - (2) Long life span and non-fertile hybrids
 - (3) Presence of unisexual flowers
 - (4) Infertile hybrids and production of large number of seeds by each plant

- **131.** Which is an example of multiple allele:-
 - (1) MN blood group
- (2) Coat colour in rat
- (3) Eye colour in human (4) Coat colour in rabbit
- **132.** A female silk moth with genotype MmRrNn produces how many types of gametes :-
 - (1) 4-types
- (2) 8-types
- (3) One type
- (4) Two types
- 133. In crop improvement programme, haploids are of great importance because they
 - (1) Are useful in studies on meiosis
 - (2) Require only about half the amount of chemical fertilisers as compare to diploids
 - (3) Give homozygous lines following diploidisation
 - (4) Grow better under adverse condition
- 134. When nucleosome becomes once again coiled, in the form of spring it is called-
 - (1) Solenoid
- (2) Chromomeres
- (3) Chromatin
- (4) None of these
- 135. Who used heavy nitrogen N¹⁵ for proving semiconservative way of DNA replication
 - (1) Masters and Broda
- (2) Meselson and Stahl
- (3) Watson and Crick
- (4) Jacob and Monad

Botany - Section B

Section B Shall Consist Of 15 (Fifteen) Questions In Each Subject. Candidate Needs To Attempt Any 10 (Ten) Questions Out Of 15 (Fifteen) In Each Subject.

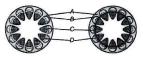
- 136. Which is a taxon:-
 - (1) Genera
- (2) Plantae
- (3) Class
- (4) All the above
- 137. The biosynthesis of auxin in plants will be inhibited due to deficinecy of -
 - (1) Mg

(2) Zn

(3) CO

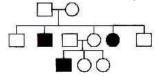
(4) K

138. Given below the diagram of TS of dicot stem showing secondary growth. Identify A to D.



- (1) A-Cortex, B-Secondary xylem, C-Secondary phloem, D-Vascular cambium
- (2) A-Cortex, B-Primary phloem, C-Vascular cambium, D-Primary xylem
- (3) A-Cortex, B-Secondary xylem, C-Vascular cambium D-Primary phloem
- (4) A-Cortex, B-Primary xylem, C-Vascular cambium D-Primary phloem

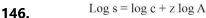
139. The given pedigree chart shows the inheritance of which of the following Mendelian disorders?

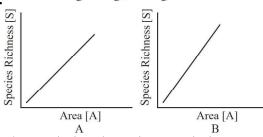


- (1) Autosomal dominant trait -myotonic dystrophy
- (2) Autosomal recessive trait -haemophilia
- (3) Autosomal recessive trait -sickle cell anaemia
- (4) Autosomal dominant trait -cystic fibrosis
- **140.** Which one is amoebic parasite?
 - (1) Trypanosoma
- (2) Plasmodium
- (3) Entamoeba
- (4) Liver fluke
- **141.** Which kingdom was added by R.H. Whittaker in Classification-
 - (1) Only Protista
- (2) Only Plantae
- (3) Protista and Plantae
- (4) Fungi
- **142.** The first stable product of carboxylation reaction in C_4 plants is :-
 - (1) PEP

- (2) OAA
- (3) PGA
- (4) RuBP
- **143.** Respiratory chain occurs on innermembrane of mitochondria this takes place during:-
 - (1) Day time
- (2) Night time
- (3) In presence of dark
- (4) All time
- **144.** Tropical dense forest is due to—
 - (1) High temperature and excess rain
 - (2) Low temperature and excess rain
 - (3) High temperature and lesser rain
 - (4) Wild animals (tigers, lions, bears etc.)

- **145.** Mark the odd one (w.r.t. second trophic level) :-
 - (1) Wolf
- (2) Grasshopper
- (3) Cow
- (4) Zooplanktons





The conclusion about given graphs is-

- (1) Area A posses high species richness than area B
- (2) Z-value is high in area A than area B
- (3) Species richness is high in area B than area A
- (4) Both area A and area B posses same Z-value
- **147**. Function of stem is
 - (1) Bear leaves and branches
 - (2) Conduction of water & minerals
 - (3) Conduction and storage of food
 - (4) All of the above
- 148. Which is not true for lac operon :-
 - (1) Discovered by Jacob & Monad
 - (2) Operates in catabolic pathway
 - (3) Example of inducible operon
 - (4) 5–structural genes are present
- **149.** Which is an ultimate source of variation:
 - (1) Crossing over
- (2) Mutation
- (3) Adaptation
- (4) Non disjunction
- **150**.X-linked recessive gene is :-
 - (1) Always expressed in male

(2) Always expressed in

female

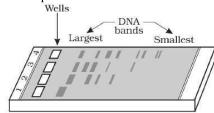
(3) Lethal

(4) Sub-lethal

Zoology -Section A

Section A Shall Consist Of 35 (Thirty-five) Questions In Each Subject .All Questions Are Compulsory.

151.Given below, is a typical agarose gel in which electrophoresis had occurred.



In this agarose gel:

- (1) Lane–1 shows migration of digested DNA fragments
- (2) Only Lane–4 shows migration of digested DNA fragments
- (3) Lane–2 to 4 shows migration of digested set of DNA fragments
- (4) Wells are always placed towards positive electrode during electrophoresis
- **152.** Action potential of a nerve cell is generated by :
 - $(1) \text{ Na}^{+}$

- $(2) K^{+}$
- $(3) Ca^{++}$
- (4) Cl
- **153.** Match the items given in **column-I** with those in **column-II** and select the **correct** option given below

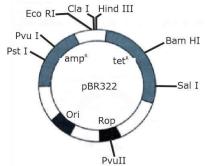
	Column I (Function)		Column II (Part of Excretory System)
(a)	Ultrafiltration	(i)	Henle's loop
(b)	Concentration of urine	(ii)	Ureter
(c)	Transport of urine	(iii)	Urinary bladder
(d)	Storage of urine	(iv)	Malpighian corpuscle
		(v)	Proximal convoluted tubule

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

154. Figure shows schematic plan of blood circulation in humans with labels a to d. Identify the label and give its functions



- (1) **d-**Dorsal aorta-takes blood from heart to body parts, $PO_2 = 95 \text{ mm Hg}$
- (2) **a-**Pulmonary vein-takes impure blood from body parts, $PO_2 = 60 \text{ mm Hg}$
- (3) **b-**Pulmonary artery-takes blood from heart to lungs, $PO_2 = 90 \text{ mm Hg}$
- (4) **c**-Vena Cava-takes blood from body parts to the right auricle, $PCO_2 = 45 \text{ mm Hg}$
- **155.** Monascus purpureus is a yeast used commercially in the production of :-
 - (1) Citric acid
 - (2) Blood chlolestrol lowering statins
 - (3) Ethanol
 - (4) Streptokinase for removing clots from the blood vessels.
- **156.** The figure below is the diagrammatic representation of the E.Coli vector pBR 322. Which one of the given options correctly identifies its certain component(s)?



- (1) Hind III, ECoRI-selectable markers
- (2) amp^R, tet^R-antibiotic resistance genes
- (3) ori-original restriction enzyme
- (4) rop-reduced osmotic pressure

1111			
157. Restriction enzymes wer	re firstly isolated from -		(A ₁ & A ₂) out of which one
(1) Haemophilus	(2) F 1'	(A ₁) has nil abundan abundance of second al	ce in a population then the $lele(A_2)$ is :-
influenzae	(2) E. coli	(1) 0.25	(2) 1.00
(3) Pseudomonas putida	(4) Agrobacterium	(3) 0.40	(4) 0.50
158. Which one of the follow	ing is a correct statement:	(3) 0.10	(1) 0.20
(1) "Bt" in "Bt-cotton" in		166. Fossil Lucy belonged to)
genetically modified organism produced through		(1) Ramapithecous	(2) Australopithecus
biotechnology		(3) Dryopithecus	(4) Aegyptopithecus.
(2) Gene transfer in any beneficial	organism is always	• • • • • • • • • • • • • • • • • • •	l4:
	irudin is being produced from		lution states that the organisms uper organism in the same
transgenic Brassica cam	pestrics seeds	-	now. This theory is called
(4) In "Flavr Savr" varie	•	(1) Theory of special cr	reation
polygalactouranase enzy which inturn inhibits over		(2) Theory of natural se	election
		(3) Lamarck's theory of	evolution
159. A gene cry-I Ac has been control of the population		(4) Theory of spontaneo	ous generation,
(1) Bugs	(2) Cotton bollworm	168. About 350 mya,	could move on land and
(3) Corn borer	(4) Beetles	go back to water. Find t blank.	the correct option to fill the
160. Microsomes are modific	eation of:	(1) Amphibians	(2) Reptiles
(1) SER	(2) RER	(3) Coelocanth	(4) Invertebrates
(3) Nucleus	(4) Golgi body	169. Apposition image is cha	aracteristic of-
161 The cell organelle assoc	iated with photorespiration is	(1) Noctural insects	(2) Diurnal insect
;-	Tarea with photor copination is	(3) Both A and B	(4) None of the above
(1) Mesosome	(2) Ribosome	(3) Both Tuna B	(1) I tolle of the above
(3) Peroxisome	(4) Lysosome	170. Which is exopeptidase	:-
		(1) Carboxypeptidase	(2) Trypsin
162. The leucoplasts, that sto		(3) Chymotrypsin	(4) None of the above
(1) Amyloplasts	(2) Elaioplasts	a=a Matabatha a danna Tank	d l II .
(3) Aleuroplasts	(4) Glyceroplasts	171. Match the column-I wit	
163. Which spindle fibre have	e smallest size :-	Abnormal frequency of bo	wel movement and
(1) Chromosomal fibre	(2) Supporting fibre	(A) increased liquidity of faeco	um as the bowel
(3) Interzonal fibre	(4) Continuous fibre	movement occurs irregular	due to the deposition (iii) Jaundice
(E) 111111 11010	(1) Commune de merc	of the pigment	
164. Significance of mitosis i	ncludes ?	(D) Ejection of gastric content	
(1) Equal distribution of chromosomes to daughter		(1) A-(ii), B-(iv), C-(iii), D-(i)	
cells (2) Restauration of symfons (yeal) was not in and muclos		(2) A-(iv), B-(ii), C-(i), D-(iii)	
(2) Restoration of surface/volume ratio and nucleo- cytoplasmic ratio		(3) A-(iv), B-(i), C-(iii)	
(3) Repair of the body		(4) A-(iv), B-(iii), C-(i)	, D- (II)
(4) All of these	_		
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- **172.**Choose **incorrect** statement from following:
 - (a) In AI many progeny are formed at a time.
 - (b) In MOET many eggs are formed at a time.
 - (c) In MOET, fertilized eggs are removed surgically.
 - (d) In MOET, 8 to 32 cells stage is transfer into uterus of genetic mother.
 - (1) a and b only
- (2) a and c only
- (3) a, b and c
- (4) a, c, and d
- **173.** Energy transformation during nerve conduction is
 - (2) Chemical to
 - (1) Chemical to radiant mechanical
 - (3) Chemical to electrical (4) Chemical to osmotic
- 174. Main function of eustachian tube is to :-
 - (1) Protect tympanic membrane from bacteria
 - (2) Support the bones of middle ear
 - (3) Equalize pressure on two sides of tympanic membrane
 - (4) Prevent infection entering ear drum
- **175.** Use of an artificial kidney during hemodialysis may result in:
 - (a) Nitrogenous waste build-up in the body
 - (b) Non-elimination of excess potassium ions
 - (c) Reduced absorption of calcium ions from gastrointestinal tract
 - (d) Reduced RBC production
 - Which of the following options is the most appropriate?
 - (1) (c) and (d) are correct (2) (a) and (d) are correct
 - (3) (a) and (b) are correct (4) (b) and (c) are correct
- **176.** Which statement is true?
 - (1) By the contraction in diaphragm, volume of thoracic cavity increases in dorso-ventral axis.
 - (2) By the contraction in diaphragm, volume of thoracic cavity increases in antero-posterior axis.
 - (3) By the contraction in EICM, volume of thoracic cacity increases in antero-posterior axis
 - (4) By the contraction in IICM, volume of thoracic cavity increases in antero-posterior axis.

- **177.** Which methods are generally advised for the male/female partner as a terminal method to prevent any more pregnancies?
 - (1) Sterilisation
- (2) Barrier method
- (3) IUDs
- (4) Oral Contraceptives
- **178.** Strore house of calcium in muscle is:
 - (1) Sarcormere
- (2) Sarcosome
- (3) Sarcoplasmic
- reticulum
- (4) Myofibril
- **179.** The blood calcium level is lowered by the deficiency of
 - (1) Parathormone
- (2) Thyroxine
- (3) Cortisol
- (4) Calcitonin
- **180.** In the case of a couple where the male is having a very low sperm count, which technique will be suitable for fertilization?
 - (1) Intrauterine transfer
 - (2) Gamete intracytoplasmic fallopian transfer
 - (3) Artificial Insemination
 - (4) Intracytoplasmic sperm injection
- **181.** Secretion of thyroid gland is controlled by :
 - (1) TRH from posterior pituitary gland and TSH from hypothalamus
 - (2) TSH from posterior pituitary gland and TRH from hypothalamus
 - (3) TRH from anterior pituitary gland and TSH from hypothalamus
 - (4) TRH from hypothalamus and TSH from anterior pituitary gland

Zoology -Section B

Section B Shall Consist Of 15 (Fifteen) Questions In Each Subject. Candidate Needs To Attempt Any 10 (Ten) Questions Out Of 15 (Fifteen) In Each Subject.

186. If there are 27 chromosomes, with 10 pg of DNA in a sperm of a fish, then the number of chromosomes and amount of DNA in the G ₂ phase of its sperm		193. Which wave pattern appear in E.E.G. during deep sleep :-	
		$(1) \alpha$	$(2) \beta$
mother cell will be-	(2) 54 1 (0	(3) δ	(4) θ
(1) 54 and 20 pg (3) 27 and 40 pg	(2) 54 and 60 pg (4) 54 and 40 pg	194. Function of Sertoli cells is controlled by :	
()	. ,	(1) Estrogen	(2) FSH
187. The chromatin material which takes darker stain in interphase is called?		(3) Testosterone	(4) ACTH
(1) Euchromatin	(2) Heterochromatin	195. Read the following sta	tements (A - D)
(3) Primary constriction	(4) Satellite body	(i) Benign tumors normally remain confined to their original location.	
188. For transformation, micro-particles coated with DNA to be bombarded with gene gun are made up of :-		(ii) Malignant tumors grow very rapidity invading and damaging the surrounding normal tissues.	
(1) Silicon or Platinum	(2) Gold or Tungsten	(iii) Metastasis is the most feared property of malignant tumors.(iv) Proto-oncogene when activated under certain conditions, Could lead to oncogenic transformation of	
(3) Silver or platinum	(4) Platinum or zinc		
1			
189. In which of the following process is not used recombinant DNA technology-		cells. How many of the above statements are correct ? (1) 3 (2) 4	
(1) For preparation of Bt-cotton			
(2) Obtained hirudin from Brassica napus		(3) 2	(4) 1
(3) Obtained humuline from E.coli		(3) 2	(4) 1
(4) Obtained single cell protein from natural mushroom		 (i) Innate immunity is a specific type of defense, that is present at the time of birth. (ii) Malignant malaria is caused by Plasmodium falciparum. (iii) Malaria could be confirmed by Widal test. (iv) Active immunity is slow and takes time to give its full effective response. (v) Saliva in the mouth acts as physiological barrier for pathogens. Which of the above statements are correct? (1) (ii), (iv) and (v) (2) (i), (iii) and (v) 	
190. Second heart sound is :-			
(1) Lubb sound at the end of ventricular systole			
(2) Dub sound at the end of ventricular systole			
(3) Lubb sound at the beginning of ventricular systole			
(4) Dub sound at the beginning of ventricular diastole			
191. If in a person 100 ml. of pure blood is carrying 13.4			
ml. of O_2 . The Hb count of his blood is :-			
(1) 15 gm / 100 ml	(2) 10 gm / 100 ml	(3) (i) and (v)	(4) (ii), (iii) and (v)
(3) 1.34 gm / 100 ml	(4) 20 gm / 100 ml	(3) (1) and (v)	(+) (II) , (III) and (V)
192. Systole is contraction of :-		is a very effective sedative and painkiller and is very useful in patients who have undergone	
(1) AV node	(2) SA node	surgery	is the have andergone
(3) Major arteries	(4) atria and ventricles	(1) Cocaine	(2) Mariinana

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(3) Morphine

(4) Nicotine

198.If ADH level of blood is less:

- (1) Volume of urine increase
- (2) Volume of urine decrease
- (3) Volume of urine is normal
- (4) Volume of urine is unaffected

199. Find out the characters which are similar in Bufo and Calotes.

- (i) The skin is dry and cornified with epidermal scales.
- (ii) Tympanum represents the ear.
- (iii) The heart is three chambered.
- (iv) Fertilisation is internal and development is direct.
- (v) Oviparous
- (1) i, ii, iii
- (2) ii, iii, v
- (3) i, iii, iv
- (4) ii, iv, v

200. Ejaculatory duct is formed by the-

- (1) Vas deferens along with the prostatic duct
- (2) Epididymis along with a duct from the seminal vesicle
- (3) Epididymis along with the prostatic duct
- (4) Vas deferens along with a duct from the seminal vesicle

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