

## PHYSICS

- 1) One moving electron when comes closer to other stationary electron, then its kinetic energy and potential energy respectively \_\_\_\_\_ and \_\_\_\_\_.

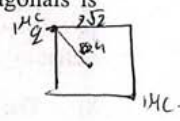
(A) increases, increases (B) increases, decreases  
(C) decreases, increases (D) decreases, decreases

- 2) An inclined plane of length 5.60 m making an angle of  $45^\circ$  with the horizontal is placed in an uniform electric field  $E = 100 \text{ Vm}^{-1}$ . A particle of mass 1 kg and charge  $10^{-2} \text{ C}$  is allowed to slide down from rest position from maximum height of slope. If the co-efficient of friction is 0.1, the time taken by the particle to reach the bottom is \_\_\_\_\_.

(A) 1 s (B) 1.41 s  
(C) 2 s (D) None of these

- 3) Charges  $1 \mu\text{C}$  are placed at each of the four corners of a square of side  $2\sqrt{2} \text{ m}$ . The potential at the point of intersection of the diagonals is \_\_\_\_\_ (K =  $9 \times 10^9 \text{ SI unit}$ )

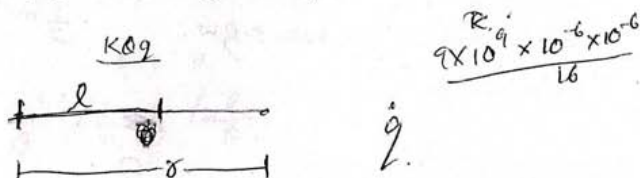
(A)  $18 \times 10^3 \text{ V}$  (B) 1800 V  
(C)  $18\sqrt{2} \times 10^3 \text{ V}$  (D) None of these



- 4) A point charge  $q$  is situated at a distance  $r$  on axis from one end of a thin conducting rod of length  $L$  having a charge  $Q$  [Uniformly distributed along its length]. The magnitude of electric force between the two is \_\_\_\_\_.

(A)  $\frac{KQq}{r^2}$  (B)  $\frac{2KQ}{r(r+L)}$   
(C)  $\frac{KQq}{r(r-L)}$  (D)  $\frac{KQq}{r(r+L)}$

(Space for Rough Work)



$$q_1 \cdot \frac{v_1}{\lambda_1} = \frac{v_2}{\lambda_2} \Rightarrow \left(\frac{v_1}{v_2}\right)^2 = \frac{\lambda_2}{\lambda_1} \Rightarrow \lambda_2 = \frac{1}{4} \lambda_1$$

- 5) If alpha particle and deuteron move with velocity  $v$  and  $2v$  respectively, the ratio of their de - Broglie wave length will be \_\_\_\_\_.

(A) 2 : 1 (B)  $1:\sqrt{2}$   
(C) 1 : 1 (D)  $\sqrt{2} : 1$

- 6) de - Broglie wave length of atom at TK absolute temperature will be

(A)  $\frac{h}{\sqrt{3mKT}}$  (B)  $\frac{h}{mKT}$   
(C)  $\frac{\sqrt{2mKT}}{h}$  (D)  $\sqrt{2mKT}$

- 7) If the wave length of light is  $4000 \text{ \AA}$ , then the number of waves in 1 mm length will be \_\_\_\_\_.

(A) 2500 (B) 25  
(C) 250 (D) 25000

- 8) The frequencies of X rays,  $\gamma$  rays and Ultra violet rays are respectively  $p, q$  and  $r$  then

(A)  $p > q, q > r$  (B)  $p < q, q > r$   
(C)  $p < q, q < r$  (D)  $p > q, q < r$

- 9) Photons having energy 1eV and 2.5 eV successively incident on a metal, having work function is 0.5 eV. The ratio of maximum speed of emitted electrons is

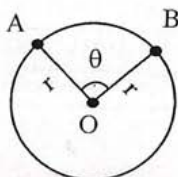
(A) 2 : 1 (B) 1 : 2  
(C) 3 : 1 (D) 1 : 3

(Space for Rough Work)

$$W = 0.5 \text{ eV} \quad \frac{1}{2} m v^2$$

2 5

- 10) A and B are two points on a uniform ring of radius  $r$ . The resistance of the ring is  $R$ .  $\angle AOB = \theta$  as shown in the figure. The equivalent resistance between points A & B is \_\_\_\_\_.



- (A)  $\frac{R(2\pi - \theta)}{4\pi}$  (B)  $\frac{R\theta}{2\pi}$   
 (C)  $R\left(1 - \frac{\theta}{2\pi}\right)$  (D)  $\frac{R}{4\pi^2}(2\pi - \theta)\theta$

- 11) Two wires of equal length and equal diameter and having resistivities  $\rho_1$  and  $\rho_2$  are connected in series. The equivalent resistivity of the combination is \_\_\_\_\_.

- (A)  $\frac{\rho_1 + \rho_2}{2}$  (B)  $(\rho_1 + \rho_2)$   
 (C)  $\frac{\rho_1 \rho_2}{\rho_1 + \rho_2}$  (D)  $\sqrt{\rho_1 \rho_2}$

(Space for Rough Work)

$$R + R$$

$$\frac{\rho_1 l}{A} + \frac{\rho_2 l}{A}$$

- 12) Match the following two columns.

Column I		Column II	
a)	Electrical resistance	p)	$ML^3T^{-3}A^{-2}$
b)	Electrical potential	q)	$ML^2T^{-3}A^{-2}$
c)	Specific resistance	r)	$ML^2T^{-3}A^{-1}$
d)	Specific conductance	s)	None of these

- (A)  $a-q, b-r, c-p, d-s$   
 (B)  $a-q, b-s, c-r, d-p$   
 (C)  $a-p, b-q, c-s, d-r$   
 (D)  $a-p, b-r, c-q, d-s$

$$V = \frac{W}{Q} = \frac{ML^2T^{-2}}{AT} = ML^2T^{-3}A^{-1}$$

- 13) Angle of minimum deviation for a prism of refractive index 1.5 is equal to the angle of prism of given prism. Then the angle of prism is \_\_\_\_\_  
 ( $\sin 48^\circ 36' = 0.75$ )

- (A)  $80^\circ$  (B)  $41^\circ 24'$   
 (C)  $60^\circ$  (D)  $82^\circ 48'$

- 14) A ray of light passes from a medium A having refractive index 1.6 to the medium B having refractive index 1.5. The value of critical angle of medium A is \_\_\_\_\_.

- (A)  $\sin^{-1} \sqrt{\frac{16}{15}}$  (B)  $\sin^{-1} \left(\frac{16}{15}\right)$   
 (C)  $\sin^{-1} \left(\frac{1}{2}\right)$  (D)  $\sin^{-1} \left(\frac{15}{16}\right)$

(Space for Rough Work)



15) The power of plane mirror is \_\_\_\_\_.

- (A) 0  
(C) 2D

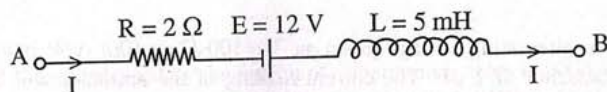
- ☒ (B)  $\infty$   
(D) 4D

16) Light waves travel from optically rarer medium to optically denser medium. Its velocity decreases because of change in \_\_\_\_\_

- ☒ (A) wavelength  
(C) amplitude

- (B) frequency  
(D) phase

17) The Network shown in Figure is a part of the circuit. (The battery has negligible resistance)



At a certain instant the current  $I = 2$  A and it is decreasing at the rate of  $10^2 \text{ As}^{-1}$ . What is the potential difference between the points B and A?

- (A) 8.5 V  
(C) 10 V

- ☒ (B) 8.0 V  
(D) 15 V

18) A rod of 10 cm length is moving perpendicular to uniform magnetic field of intensity  $5 \times 10^{-4} \text{ Wb/m}^2$ . If the acceleration of the rod is  $5 \text{ m/s}^2$ , then the rate of increase of induced emf is \_\_\_\_\_.

- (A)  $25 \times 10^{-4} \text{ Vs}$   
(C)  $20 \times 10^{-4} \text{ Vs}$

- (B)  $2.5 \times 10^{-4} \text{ Vs}^{-1}$   
(D)  $20 \times 10^{-4} \text{ Vs}^{-1}$

(Space for Rough Work)

$\mathcal{E} =$

$B = 5 \times 10^{-4}$   
 $l = 10 \text{ cm} = 0.1 \text{ m}$

$F = \frac{m}{a}$   
 $a = \frac{m}{F}$

19) A current of  $\frac{25}{\pi}$  Hz frequency is passing through an A.C. circuit having series combination of  $R = 100 \Omega$  and  $L = 2 \text{ H}$ , the phase difference between voltage and current is \_\_\_\_\_

- (A)  $60^\circ$   
(C)  $30^\circ$

- (B)  $90^\circ$   
(D)  $45^\circ$

20) In A.C. circuit having only capacitor, the current \_\_\_\_\_

- (A) leads the voltage by  $\frac{\pi}{2}$  in phase

- (B) lags behind the voltage by  $\frac{\pi}{2}$  in phase

- ☒ (C) leads the voltage by  $\pi$  in phase

- (D) lags behind the voltage by  $\pi$  in phase

21) An alternating voltage given as  $V = 100\sqrt{2} \sin 100t$  volt is applied to a capacitor of  $1 \mu\text{F}$ . The current reading of the ammeter will be equal to \_\_\_\_\_ mA.

- (A) 20  
(C) 40

$C = 1 \mu\text{F}$   
 $V =$

- (B) 10  
(D) 80

22) The distance of the closest approach of an alpha particle fired at a nucleus with kinetic energy  $K$  is  $r_0$ . The distance of the closest approach when the  $\alpha$  particle is fired at the same nucleus with kinetic energy  $2K$  will be

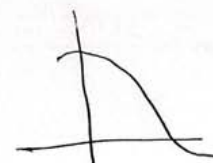
- (A)  $4r_0$

- (B)  $\frac{r_0}{2}$

- ☒ (C)  $\frac{r_0}{4}$

- (D)  $2r_0$

(Space for Rough Work)

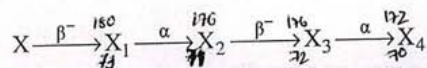


$\frac{1}{2} \frac{mv^2}{m}$

23) Number of spectral line in hydrogen atom is

- (A) 8 (B) 6  
(C) 15 (D)  $\alpha$

24) A radioactive element X disintegrates successively as under



If atomic number and atomic mass number of X are respectively 72 and 180, what are the corresponding values for  $X_4$ ?

- (A) 69, 172 (B) 69, 176  
(C) 71, 176 (D) 70, 172

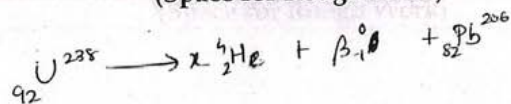
25) The energy released by the fission of one uranium atom is 200 MeV. The number of fission per second required to produce 6.4 W power is \_\_\_\_\_.

- (A)  $2 \times 10^{11}$  (B)  $10^{11}$   
(C)  $10^{10}$  (D)  $2 \times 10^{10}$

26) If by successive disintegration of  ${}_{92}\text{U}^{238}$ , the final product obtained is  ${}_{82}\text{Pb}^{206}$ , then how many number of  $\alpha$  and  $\beta$  particles are emitted?

- (A) 6 and 8 (B) 8 and 6  
(C) 12 and 6 (D) 8 and 12

(Space for Rough Work)



$$238 = 206 + 4x$$

$$92 = 82 + 2x - y$$

[9]

(P.T.O.)

27) A change of 0.04 V takes place between the base and the emitter when an input signal is connected to the CE transistor amplifier. As a result, 20  $\mu\text{A}$  change take place in the base current and a change of 2 mA takes place in the collector current. Find the input resistance and A.C. current gain.

- (A)  $1\text{k}\Omega$ , 100 (B)  $2\text{k}\Omega$ , 100  
(C)  $2\text{k}\Omega$ , 200 (D)  $1\text{k}\Omega$ , 200

28) A plane polarized light is incident normally on a tourmaline plate. Its E vectors make an angle of  $60^\circ$  with the optic axis of the plate. Find the percentage difference between initial and final intensities.

- (A) 50% (B) 25%  
(C) 75% (D) 90%

29) Light of wave length  $\lambda$  is incident on slit of width  $d$ . The resulting diffraction pattern is observed on a screen placed at distance  $D$ . The linear width of central maximum is equal to width of the slit, then  $D =$  \_\_\_\_\_

- (A)  $\frac{2\lambda^2}{d}$  (B)  $\frac{d^2}{2\lambda}$   
(C)  $\frac{d}{\lambda}$  (D)  $\frac{2\lambda}{d}$

(Space for Rough Work)



- 30) In a N-P-N transistor about  $10^{10}$  electrons enter the emitter in  $2\mu\text{s}$ , when it is connected to a battery. Then  $I_E =$  \_\_\_\_\_  $\mu\text{A}$ .

(A) 400  
(B) 200  
(C) 800  
(D) 1600

$$\frac{10^{10} \times 1.6 \times 10^{-19}}{2 \times 10^{-6}} = 8 \times 10^{-5} = 80 \times 10^{-6} = 80 \mu\text{A}$$

- 31) The effective length of a magnet is 31.4 cm and its pole strength is 0.8 Am. The magnetic moment, if it is bent in the form of a semicircle is \_\_\_\_\_  $\text{Am}^2$ .

(A) 1.2  
(B) 1.6  
(C) 0.16  
(D) 0.12

$0.314$

$m = 0.8$   
 $l = 0.314$   
 $0.98$

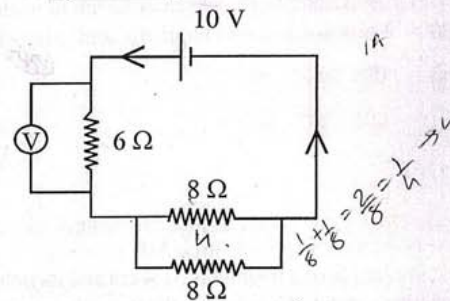
- 32) Equal currents are passing through two very long and straight parallel wires in the same direction. They will \_\_\_\_\_.

(A) attract each other  
(B) repel each other  
(C) lean towards each other  
(D) neither attract nor repel each other



(Space for Rough Work)

- 33) A voltmeter of a very high resistance is joined in the circuit as shown in figure. The voltage shown by this voltmeter will be \_\_\_\_\_.



(A) 5 V  
(B) 6 V  
(C) 2.5 V  
(D) 3 V

- 34) A galvanometer of resistance  $50\Omega$  is connected to a battery of 8 V along with a resistance of  $3950\Omega$  in series. A full scale deflection of 30 div is obtained in the galvanometer. In order to reduce this deflection to 15 division, the resistance in series should be \_\_\_\_\_  $\Omega$ .

$G = 50\Omega$   
 $V = 8$   
 $R = 3950$

(A) 1950  
(B) 7900  
(C) 2000  
(D) 7950

- 35) At a place on Earth, the vertical component of Earth's magnetic field is  $\sqrt{3}$  times its horizontal component. The angle of dip at this place is \_\_\_\_\_.

(A)  $60^\circ$   
(B)  $30^\circ$   
(C)  $45^\circ$   
(D)  $0^\circ$

(Space for Rough Work)

$\tan \theta = \sqrt{3}$

36) Which gate can be obtained by shorting both the input terminals of a NOR gate.

- (A) NOT (B) OR  
(C) AND (D) NAND

37) An optical fiber can offer a band width of \_\_\_\_\_.

- (A) 100 GHz (B) 100 MHz  
(C) 750 MHz (D) 250 MHz

38) To transmit a signal of 3 KHz frequency, the minimum length of antenna is \_\_\_\_\_ km

- (A) 25 (B) 20  
(C) 50 (D) 75

39) 27 identical drops of mercury are charged simultaneously with the same potential of 10 Volt. Assuming the drop to be spherical, if all the charged drops are made to combine to form one large drop, then its potential will be \_\_\_\_\_ Volt.

- (A) 40 (B) 90  
(C) 160 (D) 10

40) When  $10^{19}$  electrons are removed from a neutral metal plate through some process, the charge on it becomes \_\_\_\_\_.

- (A) +1.6 C (B) -1.6 C  
(C)  $10^{19}$  C (D)  $10^{-19}$  C

(Space for Rough Work)

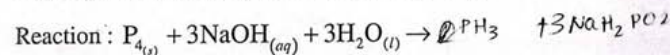
$$10^{19} \times 1.6 \times 10^{-19}$$

## CHEMISTRY

41) Which method is used to get very pure germanium used in semiconductor?

- (A) vapour - phase refining  
(B) electrolysis  
(C) liquation  
(D) zone - refining

42) Which product will be obtained in the following reaction?



- (A)  $PH_{3(g)} + 3NaH_2PO_{2(aq)}$  (B)  $PH_{3(g)} + 3Na_2HPO_{2(aq)}$   
(C)  $2PH_{3(g)} + 3Na_2HPO_{2(aq)}$  (D)  $2PH_{3(g)} + 3NaH_2PO_{2(aq)}$

43) The molecular formulae for phosgene and tear gas are \_\_\_\_\_ and \_\_\_\_\_ respectively.

- (A)  $COCl_2$  and  $CCl_2NO_2$  (B)  $SOCl_2$  and  $CCl_2NO_2$   
(C)  $COCl_2$  and  $CCl_3NO_2$  (D)  $SOCl_2$  and  $CCl_3NO_2$

44) Which of the following mixture is called Aquaregia?

- (A) Three parts of dil. HCl and 1 part of conc.  $HNO_3$   
(B) Two parts of conc. HCl and two parts of conc.  $HNO_3$   
(C) Three parts of conc. HCl and 1 part of dil.  $HNO_3$   
(D) Three parts of conc. HCl and 1 part of conc.  $HNO_3$

(Space for Rough Work)



45) Which of the following is allylic halide?

- (A) (1 - bromo ethyl) benzene  
 (B) Benzyl chloride  
 (C) 1 - bromo benzene  
 (D) 3 - chloro cyclo hex-1-ene

46) 50% of the reagent is used for dehydrohalogenation of 6.45 gm  $\text{CH}_3\text{CH}_2\text{Cl}$ . What will be the weight of the main product obtained?

- [At. mass of H, C and Cl are 1, 12 & 35.5 gm/mole<sup>-1</sup> respectively]  
 (A) 1.4 gm  
 (B) 0.7 gm  
 (C) 2.8 gm  
 (D) 5.6 gm

47) Name the following reaction  $\text{CH}_3\text{CH}_2\text{Cl} + \text{NaI} \xrightarrow{\text{acetone}} \text{CH}_3\text{CH}_2\text{I} + \text{NaCl}$

- (A) Frinkel-stein reaction  
 (B) Swartz reaction  
 (C) Wurtz reaction  
 (D) Hell-Volhard Zelinsky reaction

48) Which reagent is used for bromination of methyl phenyl ether?

- (A)  $\text{Br}_2 / \text{CH}_3\text{COOH}$   
 (B)  $\text{Br}_2 / \text{Red P}$   
 (C)  $\text{Br}_2 / \text{FeBr}_3$   
 (D)  $\text{HBr} / \Delta$

(Space for Rough Work)

49) Which of the following acid does not have  $-\text{COOH}$  group?

- (A) Picric acid  
 (B) Ethanoic acid  
 (C) Benzoic acid  
 (D) Salicylic acid

50) Which of the following statement is not correct?

- (A) Phenol is neutralised by sodium carbonate  
 (B) Phenol is used to prepare analgesic drugs  
 (C) Solubility of phenol in water is more than that of chlorobenzene  
 (D) Boiling point of o-nitrophenol is lower than that of p-nitrophenol

51) Total order of reaction  $\text{X} + \text{Y} \rightarrow \text{XY}$  is 3. The order of reaction with respect to X is 2. State the differential rate equation for the reaction.

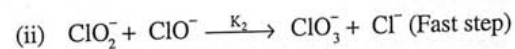
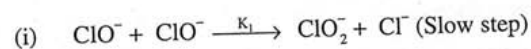
- (A)  $-\frac{d[\text{X}]}{dt} = k[\text{X}]^0[\text{Y}]^3$   
 (B)  $-\frac{d[\text{X}]}{dt} = k[\text{X}]^3[\text{Y}]^0$   
 (C)  $-\frac{d[\text{X}]}{dt} = k[\text{X}]^2[\text{Y}]$   
 (D)  $-\frac{d[\text{X}]}{dt} = k[\text{X}][\text{Y}]^2$

52)  $\text{X} \xrightarrow{\text{Step-I}} \text{Y} \xrightarrow[\text{slow}]{\text{Step-II}} \text{Z}$  is a complex reaction. Total order of reaction is 2 and Step - II is slow step. What is molecularity of Step-II?

- (A) 2  
 (B) 1  
 (C) 3  
 (D) 4

(Space for Rough Work)

53) Reaction  $3\text{ClO}^- \rightarrow \text{ClO}_3^- + 2\text{Cl}^-$  occurs in following two steps.



then the rate of given reaction = \_\_\_\_\_.



54) At given temperature and pressure adsorption of which gas of the following will take place the most?



55) Which type of colloid is the dissolution of sulphur ( $\text{S}_8$ )?

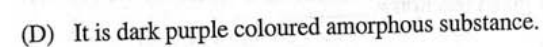
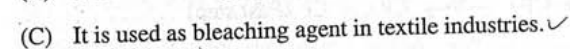
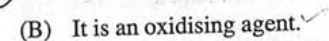
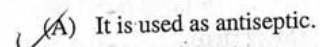


56) For Adsorption phenomenon,



(Space for Rough Work)

57) Which of the following statement is incorrect for  $\text{KMnO}_4$ ?



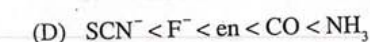
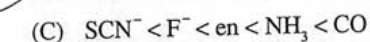
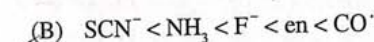
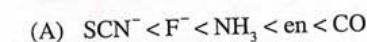
58) Which of the following ion has the maximum theoretical magnetic moment?



59) Which of the following oxide has the maximum basicity?



60) Which of the following spectrochemical series is true?



(Space for Rough Work)



61) Which of the following complex is paramagnetic?

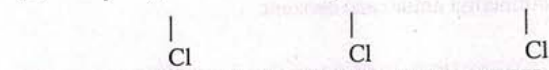
- (A)  $[\text{Co}(\text{NH}_3)_6]^{3+}$  (B)  $[\text{Ni}(\text{CO})_4]$   
(C)  $[\text{Ni}(\text{CN})_4]^{2-}$  (D)  $[\text{NiCl}_4]^{2-}$

62) Both  $[\text{Ni}(\text{CO})_4]$  and  $[\text{Ni}(\text{CN})_4]^{2-}$  are diamagnetic. The types of hybridisation of Ni in these complexes are \_\_\_\_\_ & \_\_\_\_\_ respectively.

- (A)  $\text{sp}^3, \text{dsp}^2$  (B)  $\text{sp}^3, \text{sp}^3$   
(C)  $\text{dsp}^2, \text{sp}^3$  (D)  $\text{dsp}^2, \text{dsp}^2$  ✓

63) Which of the following order of acidic strength is not correct?

- (A)  $\text{CH}_3\cdot\text{CH}_2\cdot\text{CH}\cdot\text{COOH} > \text{CH}_3\cdot\text{CH}\cdot\text{CH}_2\cdot\text{COOH} > \text{CH}_2\cdot\text{CH}_2\cdot\text{CH}_2\cdot\text{COOH}$



- ✓ (C)  $\text{H}\cdot\text{COOH} > \text{CH}_3\text{COOH} > \text{C}_6\text{H}_5\text{COOH}$

- (D)  $\text{CH}_3\text{COOH} > \text{CH}_3\cdot\text{CH}_2\cdot\text{COOH} > (\text{CH}_3)_2\text{CH}\cdot\text{COOH}$

64) What is the formula of Acrolein?

- (A)  $\text{CH}_2 = \text{CH} - \text{CN}$   
(B)  $\text{CH}_2 = \text{CH} - \text{CHO}$   
(C)  $\text{CH}_2 = \text{CH} - \text{COOH}$   
(D)  $\text{CH}_2 = \text{CH} - \text{CONH}_2$

(Space for Rough Work)

65) What is IUPAC name for isophthalic acid?

- ✓ (A) Benzene - 1, 2 dicarboxylic acid  
(B) Benzene - 1, 3 dicarboxylic acid  
(C) Benzene - 1, 4 dicarboxylic acid  
(D) Benzene - 1, 5 dicarboxylic acid

66) What is the name for red azo dye?

- (A)  $\beta$  - naphthyl azo benzene  
(B) p - hydroxy azo benzene  
(C) p - amino azo benzene  
(D) p - N, N dimethyl amino azo benzene

67) Which of the following is not formed by Sandmeyer reaction?

- (A)  $\text{C}_6\text{H}_5\text{I}$  (B)  $\text{C}_6\text{H}_5\text{Cl}$   
(C)  $\text{C}_6\text{H}_5\text{Br}$  ✓ (D)  $\text{C}_6\text{H}_5\text{CN}$

68) For which vitamin liver is not the source?

- (A) Vitamin -  $\text{B}_2$  (B) Vitamin -  $\text{B}_1$   
✓ (C) Vitamin -  $\text{B}_{12}$  (D) Vitamin - H

(Space for Rough Work)

69) In which of the following compound, all the monosaccharide units are not joined by  $C_1 - O - C_4$  chain.

- (A) Lactose (B) Maltose  
(C) Cellulose (D) Amylopectin

70) Which of the following polymer is formed by cationic addition polymerisation reaction?

- (A) Poly styrene (B) Butyl rubber  
(C) Teflon (D) PVC

71) Which of the following polymer is used in pigment?

- (A) Neoprene (B) Buna - S  
(C) Teflon (D) Orlon

72) To prevent food from spoilage by microorganism, which substance is used?

- (A) Arneto (B) Aspartame  
(C) Salt of sorbic acid (D) Tetrazine

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(Space for Rough Work)

73) Which of the following defect is seen in FeO?

- (A) Metal deficiency defect  
(B) Metal excess defect  
(C) Displacement defect  
(D) Impurity defect

74) Which of the following substance possess antiferromagnetic property?

- (A)  $CrO_2$  (B)  $Fe_3O_4$   
(C)  $H_2O$  (D)  $MnO$

75) The boiling points for aqueous solutions of sucrose and urea are same at constant temperature. If 3 gm of urea is dissolved in its 1 litre solution, what is the weight of sucrose dissolved in its 1 litre solution?

[Urea - 60 gm/mole, sucrose = 342 gm/mole]

- (A) 17.1 gram (B) 3.0 gram  
(C) 6.0 gram (D) 34.2 gram

76) Which option is inconsistent for Raoult's law?

- (A) The change in heat of dilution for solution = 0  
(B) Volume of liquid solvent + volume of liquid solute = volume of solution.  
(C) Solute does not undergo association in solution  
(D) Solute undergoes dissociation in solution

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(Space for Rough Work)



77) Which colligative property is more useful to determine the molecular weight of the substances like proteins and polymers?

- ✓ (A) Elevation in boiling point  
(B) Lowering of vapour pressure +  
(C) Depression of freezing point  
(D) Osmotic pressure +

78) The resulting solution obtained at the end of electrolysis of concentrated aqueous solution of NaCl \_\_\_\_\_.

- (A) turns blue litmus into red  
(B) turns red litmus into blue  
(C) remains colourless with phenolphthalein  
✓ (D) the colour of red or blue litmus does not change

79) The value of  $E_{red}^{\circ}$  for metal A, B and C are 0.34 Volt, -0.80 Volt and -0.46 Volt respectively. State the correct order for their ability to act as reducing agent. *Lower  $e^{-}$  easily.*

- (A)  $A > B > C$  (B)  $C > B > A$   
✓ (C)  $B > C > A$  (D)  $C > A > B$

80) Two electrolytic cells containing molten solutions of Nickel chloride & Aluminium chloride are connected in series. If same amount of electric current is passed through them, what will be the weight of Nickel obtained when 18 gm of Aluminium is obtained? (Al - 27 gm/mole, Ni - 58.5 gm/mole<sup>-1</sup>)

- (A) 117 gm (B) 58.5 gm  
(C) 29.25 gm (D) 5.85 gm

(Space for Rough Work)

## BIOLOGY

✓ 81) In which field application of biotechnology occurs?

- (A) Bio-medicine  
(B) Agriculture  
(C) Environmental field  
(D) ✓ All of the above

✓ 82) \_\_\_\_\_ shows anti-allergic and anti-inflammatory effect.

- ✓ (A) Glucocorticoids  
(B) Mineralocorticoids  
(C) Sexcorticoids \*  
(D) Noradrenaline

✓ 83) During the process of decomposition in which stage complex organic matter convert into inorganic ions and salts by fungi?

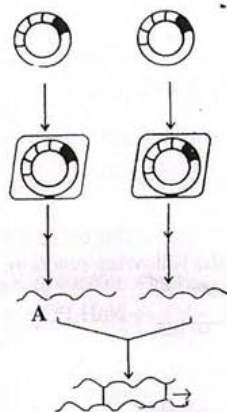
- (A) Mineralization (B) Catabolism  
✓ (C) Fragmentation (D) All of the above

✓ 84) How much amount of volume of air is in lungs FRC?

- ✓ (A) 2100 ml to 2500 ml ✓ (B) 1500 ml to 1600 ml  
(C) 2500 ml to 3000 ml (D) 1600 ml to 2100 ml

(Space for Rough Work)

85) What indicated "A" in given figure?



- (A) Glycosidic bond  
(B) Peptide bond  
(C) Disulfide bond  
(D) Hydrophobic bond

86) What is total diastolic time of ventricle in cardiac cycle?

- (A) 0.40 second  
(B) 0.30 second  
(C) 0.50 second  
(D) 0.10 second

87) Which amino acid determines by four genetic codes?

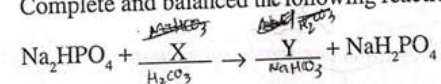
- (A) Proline (Pro)  
(B) Leucine (Leu)  
(C) Serine (Ser)  
(D) Tyrosine (Tyr)

(Space for Rough Work)

88) Which is the inhibitory hormone of GH?

- (A) Parathormone  
(B) Insulin  
(C) Somatostatin  
(D) Testosterone

89) Complete and balanced the following reaction.



- (A)  $\text{X} = \text{H}_2\text{CO}_3$ ,  $\text{Y} = \text{NaH}_2\text{CO}_3$   
(B)  $\text{X} = \text{NaHCO}_3$ ,  $\text{Y} = \text{NaCl}$   
(C)  $\text{X} = \text{NaHCO}_3$ ,  $\text{Y} = \text{H}_2\text{CO}_3$   
(D)  $\text{X} = \text{H}_2\text{CO}_3$ ,  $\text{Y} = \text{NaHCO}_3$

90) How many molecules of ATP and NADPH are require in formation of two molecules of glucose? How many Calvin cycles are required?

- (A) 18 ATP, 12 NADPH, 6 Calvin cycles  
(B) 36 ATP, 24 NADPH, 12 Calvin cycles  
(C) 36 ATP, 24 NADPH, 6 Calvin cycles  
(D) 24 ATP, 36 NADPH, 12 Calvin cycles

(Space for Rough Work)



91) A - The DNA fingerprint is the same for every cell, tissue and organ of a person.

R - DNA fingerprint is used for treatment of inherited disorders like Huntington's disease, Alzheimer's and Sickle cell anemia.

(A) A and R both are correct but R is not explanation of A

(B) A and R both are correct. R is explanation of A

(C) A is correct and R is wrong

(D) A is wrong and R is correct

92) Which part is not included in Cochlear duct?

(A) Macula of Utricle

(B) Reissner's membrane

(C) Scala Media

(D) Tectorial membrane

93) Which is Gynandromorph type of animal?

(A) Drosophilla

(B) Beetles

(C) Silk worms

(D) All of the above

94) DNA polymerase enzyme is isolated from which bacteria?

(A) Thermus aquaticus

(B) E.Coli

(C) Bacillus thuringiensis

(D) Agro bacterium

(Space for Rough Work)

95) Match the column I, II and III

Column I

Column II

Column III

P) Trichomoniasis

i) Herpes Simplex

x) Pain in lower abdomen

Q) Syphilis

ii) Neisseria gonorrhoeae

y) Inflammation and itching in and around vagina

R) Gonorrhoea

iii) Treponema Pallidum

z) Patchy hair loss

S) Genital herpes

iv) Trichomonas Vaginalis

w) Feeling of uneasiness

(A) (P - iv - y) (Q - i - z) (R - ii - x) (S - iii - w)

(B) (P - iv - y) (Q - iii - z) (R - ii - x) (S - i - w)

(C) (P - iv - x) (Q - i - w) (R - ii - y) (S - iii - z)

(D) (P - i - z) (Q - ii - y) (R - iv - w) (S - iii - x)

96) What is the height and weight of twelve weeks old human embryo?

(A) 7.5 cm, 14 gram

(B) 7.5 cm, 650 gram

(C) 42 cm, 1800 gram

(D) 32 cm, 650 gram

(Space for Rough Work)

- ✓ 97) Assertion A : Restriction endonuclease recognize short palindromic sequence and cut at specific sites.

Reason - R : When a restriction endonuclease acts on Palindrome, it cleaves both the strands of DNA molecule.

- (A) A and R are both correct but R is not explanation of A  
 ✓ (B) A and R are both correct. R is explanation of A  
 (C) A is correct and R is wrong  
 (D) A is wrong and R is correct

- ✓ 98) Write proper option by matching column I, II and III.

Column I (Name)	Column II (Enzyme)	Column III (Function)
i) Gastric Juice	P) Chymo- trypsinogen	A) Dipeptide convert into amino acid
ii) Intestinal Juice	Q) Ptylin	B) Proteoses convert into small polypeptides
iii) Saliva	R) Renin	C) Casein convert into paracasein
iv) Pancreatic juice	S) Erepsin	D) Conversion of starch into maltose

- (A) (i - R - C) (ii - S - A) (iii - Q - D) (iv - P - B)  
 (B) (i - R - C) (ii - S - A) (iii - Q - B) (iv - P - D)  
 (C) (i - S - D) (ii - R - C) (iii - P - B) (iv - Q - A)  
 (D) (i - Q - A) (ii - P - C) (iii - R - B) (iv - S - D)

(Space for Rough Work)

- ✓ 99) Write the correct sequence of genetic diversity.

- (A) Population → Species → Chromosomes → Genes → Nucleotides  
 (B) Kingdom → Population → Species → Genes → Chromosome → Nucleotides ✗  
 (C) Species → Genes → Population → Chromosomes → Nucleotides ✗  
 ✓ (D) Kingdom → Species → Chromosomes → Genes → Nucleotides

- ✓ 100) Match the column I and II and select the correct option.

Column I	Column II (concentration of DDT in ppm)				
A) Zooto Plankton	P) 0.003 ppm				
B) Small fishes	Q) 2 ppm				
C) Water	R) 25 ppm				
D) Fish eating birds	S) 0.04 ppm				
E) Big fishes	T) 0.5 ppm				
A	B	C	D	E	
(A)	S	T	P	Q	R
(B)	S	T	P	R	Q
(C)	S	T	R	Q	P
(D)	Q	P	S	T	R

(Space for Rough Work)

D E B A C  
 R Q T S P



101) Which of the following disease shows the blockage of kidney tubules and causes severe back pain?

- (A) Kidney failure
- (B) Renal calculi
- (C) Uremia
- (D) Nephritis

102) During photorespiration which compounds are formed having 2C and 3C respectively in Peroxisome?

- (A) Glycine, Glycerate
- (B) Glycolate, Glycine
- (C) Serine, Glycine
- (D) Phosphoglycerate, Glycolate

103) During rainy season wooden doors and windows are not properly closed. Why?

- (A) Diffusion
- (B) Plasmolysis
- (C) Osmosis
- (D) Imbibition

(Space for Rough Work)

104) Match the column I, II and III

Column I	Column II	Column III
A) Sickle Cell Anaemia	i) Due to recessive PP genes	P) Arrangement of Valine in place of Glutamic acid
B) Phenyl Ketonuria	ii) Due to absence of homogentisic oxidase enzyme	Q) Inborn error of metabolism
C) Alkaptonuria	iii) Follows Mendelian Principles	R) Urine turns black when exposed to air
D) Thalassaemia	iv) Characters caused by homozygous recessive genes	S) The required haemoglobin is not generated in the blood

(A) (A - iv - P) (B - i - Q) (C - ii - R) (D - iii - S)

(B) (A - ii - S) (B - iii - R) (C - i - Q) (D - iv - P)

(C) (A - iv - P) (B - iii - R) (C - i - S) (D - ii - R)

(D) (A - iii - R) (B - i - Q) (C - iv - P) (D - ii - S)

105) Which of the following is the symptom of Ulcerative colitis?

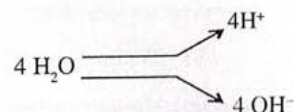
- (A) Difficulty in swallowing
- (B) Watery stools containing blood and mucus
- (C) Loss of appetite
- (D) Eyes turn yellow

(Space for Rough Work)

106) Which one is not cranial bone?

- (A) Zygomatic (B) Frontal  
(C) Temporal (D) Sphenoid

107)



In this process which of the following play important role?

- (A) Chlorophyll (B) Light energy  
(C)  $\text{Ca}^{++}$ ,  $\text{Mn}^{++}$ ,  $\text{Cl}^-$  (D) All of the above

108) Which of the following is correct trend of succession in Hydrosere succession?

- (A) Phytoplankton  $\rightarrow$  Reed swamp  $\rightarrow$  Rooted submerged  $\rightarrow$  Sedge meadow  
(B) Phytoplankton  $\rightarrow$  Rooted submerged  $\rightarrow$  Reed swamp  $\rightarrow$  Sedge meadow  
(C) Phytoplankton  $\rightarrow$  Sedge meadow  $\rightarrow$  Reed swamp  $\rightarrow$  Root submerged  
(D) Rooted submerged  $\rightarrow$  Phytoplankton  $\rightarrow$  Reed swamp  $\rightarrow$  Sedge meadow

(Space for Rough Work)

109) On which surface of cell Donnan equilibrium occur?

- (A) Tonoplast (B) Cell wall  
(C) Plasma membrane (D) Nuclear membrane

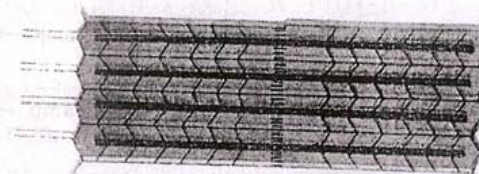
110) Which type of gene regulate sex-determination in Spinach plant?

- (A) Heterozygous genes (B) Homozygous genes  
(C) Single gene (D) Multiple genes

111) When the respiratory substances are more than one then which respiratory substrates are not used?

- (A) Pure Protein (B) Lipid  
(C) Carbohydrate (D) (A) and (B) both

112) State the condition of muscle contraction in following diagram.



- (A) Resting potential (B) Contraction  
(C) Maximally contracted (D) None

(Space for Rough Work)



113) How many years are considered in one minute in Geological clock?

- (A) 1,87,500,000 years (B) 52000 years  
(C) 3,25,000 years (D) 1,90,000 years

114) Which structure is formed at the time of exchange of gamete nuclei in given animal during sexual reproduction.



- (A) Cytoplasmic filaments (B) Plasmodesmata  
(C) Internal tubule (D) Cytoplasmic bridge

115) Name the plant shows adventive embryonic cells.

- (A) Citrus and Mango (B) Sunflower and Mango  
(C) Lemon and Maize (D) Lemon and Palms

(Space for Rough Work)

116) During respiration \_\_\_\_\_.

- (A) 2 PGAL during glycolysis and 4 Pyruvic acid are produced in Kreb's cycle  
(B) 2 PGAL during glycolysis and none of the PGAL produced in Kreb's cycle  
(C) 2 PGAL during glycolysis and 2 Pyruvic acid are produced in Kreb's cycle  
(D) PGAL is not produced during respiratory events

117) Which of the following function is performed by collecting tubule of kidney?

- (A) In the maintenance of pH and ionic balance of blood by the secretion of  $H^+$  and  $K^+$  ions  
(B) Maintenance of pH of blood and removal of  $Na^+$  and  $K^+$  ions  
(C) Absorption of glucose and ammonia from the blood  
(D) None of above

118) A - Nerve fibre can become excited through touch, smell, pressure and chemical changes and there is a change in polarity.

R - It is called active potential.

- (A) A and R both are correct but A is not correct explanation of R.  
(B) A and R both are correct and A is correct explanation of R.  
(C) A is correct and R is wrong  
(D) A is wrong and R is correct

(Space for Rough Work)

119) Select proper option, by matching column I, II and III.

Column I (Common Name)	Column II (Roman Numerical Designation)	Column III (Activation product)
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P) Prothrombin	x) I	i) Convertin
Q) Proconvertin	y) V	ii) Fibrin
R) Fibrinogen	z) II	iii) Thrombin
S) Proaccelerin	w) VII	iv) Accelerin

(A) ~~(P - w - ii)~~ ~~(Q - z - iii)~~ ~~(R - y - iv)~~ ~~(S - x - i)~~

(B) (P - z - iii) (Q - w - i) (R - y - ii) (S - x - iv)

(C) ~~(P - z - iii)~~ ~~(Q - w - ii)~~ ~~(R - x - iv)~~ ~~(S - y - i)~~

(D) (P - z - iii) (Q - w - i) (R - x - ii) (S - y - iv)

120) What is "A" and "B" in given diagram?

(A) A = RNA Primer

B = DNA Helicase

(B) A = RNA Primer

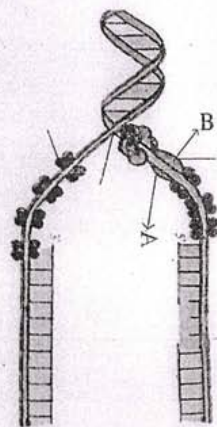
B = RNA Helicase

(C) A = Single strand Binding Protein

B = DNA Helicase

(D) A = Lagging strand

B = Movement of Helicase



(Space for Rough Work)