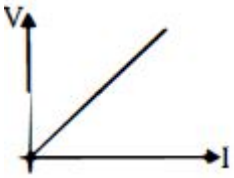
ROYAL ACADEMY- RAJKOT

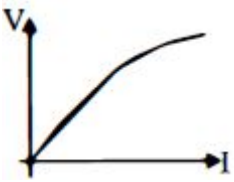
RENEET PAPER -17 **Marks : 720**

Sub. : PCB(EM) **Date :15.09.2024**

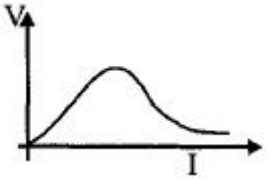
Physics - Section A (MCQ)

(1) Suppose the drift velocity v_d in a material varied with the applied electric field E as $v_d \propto \sqrt{E}$ .Then $V-I$ graph for a wire made of such a material is best given by

(A) 

(B) 

(C) 

(D) 

(2) A current of $10\,A$ exists in a wire of crosssectional area of $5\,mm^2$ with a drift velocity of $2\times10^{-3}\,ms^{-1}$. The number of free electrons in each cubic meter of the wire is .....

(A) 2×10^{6} (B) 625×10^{25} (C) 2×10^{25} (D) 1×10^{23}

(3) A copper wire of length $10\,m$ and radius $(10^{-2}/\sqrt{\pi})\,m$ has electrical resistance of $10\,\Omega$. The current density in the wire for an electric field strength of $10(V/m)$ is :

(A) $10^{6}A/m^2$ (B) $10^{-5}A/m^2$ (C) $10^{5}A/m^2$ (D) $10^{4}A/m^2$

(4) A wire $50\,cm$ long and $1\ mm^2$ in cross -section carries a current of $4\ A$ when connected to a $2\ V$ battery. The resistivity of the wire is

(A) $1\times10^{-6}\ \Omega-m$ (B) $4\times10^{-6}\ \Omega-m$ (C) $5\times10^{-7}\ \Omega-m$ (D) $2\times10^{-7}\ \Omega-m$

(5) By increasing the temperature, the specific resistance of a conductor and a semiconductor

(A) Increases for both (B) Decreases for both (C) Increases, decreases (D) Decreases, increases

(6) In the following 'I' refers to current and other symbols have their usual meaning, Choose the option that corresponds to the dimensions of electrical conductivity

(A) $M^{-1}L^{-3}T^{3}I$ (B) $M^{-1}L^{-3}T^{3}I^{2}$ (C) $M^{-1}L^{3}T^{3}I$ (D) $ML^{-3}T^{-3}I^{2}$

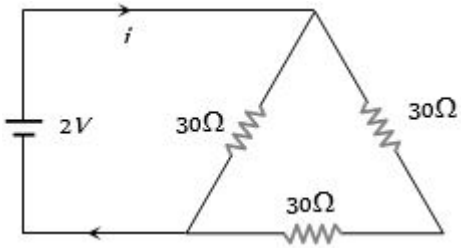
(7) If n, e, τ and m are representing electron density, charge, relaxation time and mass of an electron respectively, then the resistance of a wire of length / and cross-sectional area A is given by

(A) $\frac{ml}{ne^2\tau A}$ (B) $\frac{m\tau A}{ne^2 I}$ (C) $\frac{ne^2\tau A}{ml}$ (D) $\frac{ne^2 A}{m\tau I}$

(8) A wire of resistance R is divided in 10 equal parts. These parts are connected in parallel, the equivalent resistance of such connection will be

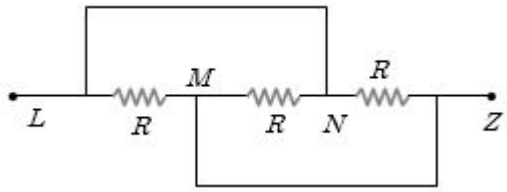
(A) $0.01\,R$ (B) $0.1\,R$ (C) $10\,R$ (D) $100\,R$

(9) The current in the adjoining circuit will be



(A) $\frac{1}{45}\,ampere$ (B) $\frac{1}{15}\,ampere$ (C) $\frac{1}{10}\,ampere$ (D) $\frac{1}{5}\,ampere$

(10) Three equal resistances each of value R are joined as shown in the figure. The equivalent resistance between M and N is

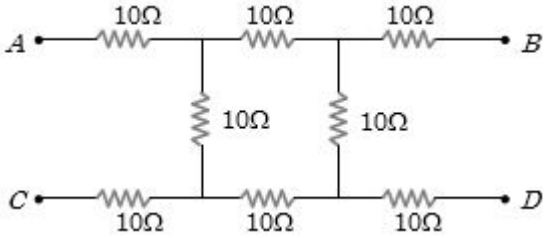


(A) R (B) $2R$ (C) $\frac{R}{2}$ (D) $\frac{R}{3}$

(11) n equal resistors are first connected in series and then connected in parallel. What is the ratio of the maximum to the minimum resistance

(A) n (B) $\frac{1}{n^2}$ (C) n^2 (D) $\frac{1}{n}$

(12) What will be the equivalent resistance between the two points A and D ..... Ω



(A) 10 (B) 20 (C) 30 (D) 40

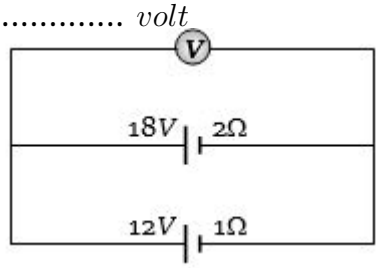
(13) n identical cells each of $e.m.f.$ E and internal resistance r are connected in series. An external resistance R is connected in series to this combination. The current through R is

(A) $\frac{nE}{R+nr}$ (B) $\frac{nE}{nR+r}$ (C) $\frac{E}{R+nr}$ (D) $\frac{nE}{R+r}$

(14) A car battery of $e.m.f.$ $12\,V$ and internal resistance $5\times10^{-2}\,\Omega$, receives a current of $60\ A$ from external source, then terminal voltage of battery is

(A) 9 (B) 12 (C) 15 (D) 20

(15) Two batteries, one of emf $18\,volts\ emf$ and internal resistance $2\,\Omega$ and the other of emf $12\,volt$ and internal resistance $1\,\Omega$, are connected as shown. The voltmeter V will record a reading of ..... $volt$

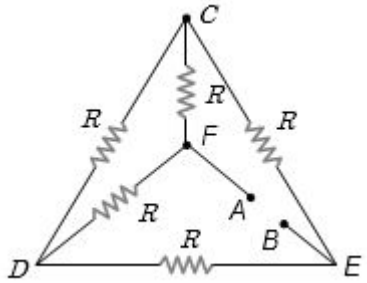


(A) 15 (B) 30 (C) 14 (D) 18

(16) A cell of internal resistance r is connected across an external resistance nr. Then the ratio of the terminal voltage to the emf of the cell is

(A) $\frac{1}{n}$ (B) $\frac{1}{n+1}$ (C) $\frac{n}{n+1}$ (D) $\frac{n-1}{n}$

(17) Five equal resistances each of resistance R are connected as shown in the figure. A battery of $V\ volts$ is connected between A and B. The current flowing in $AFCEB$ will be



(A) $\frac{3V}{R}$ (B) $\frac{V}{2R}$ (C) $\frac{V}{R}$ (D) $\frac{2V}{R}$

(18) When an object is at rest

(A) Force is required to keep it in rest state

(B) No force is acting on it

(C) A large number of forces may be acting on it which balance each other

(D) It is in vacuum

(19) The average force necessary to stop a bullet of mass $20\,g$ moving with a speed of $250\,m/s$, as it penetrates into the wood for a distance of $12\,cm$ is

(A) $2.2 \times 10^3 N$ (B) $3.2 \times 10^3 N$ (C) $4.2 \times 10^3 N$ (D) $5.2 \times 10^3 N$

(20) A body, under the action of a force $\vec{F} = 6\hat{i} - 8\hat{j} + 10\hat{k}$, acquires an acceleration of $1\,m/s^2$ The mass of this body must be

(A) $15\,kg$ (B) $20\,kg$ (C) $10\sqrt{2}\,kg$ (D) $2\sqrt{10}\,kg$

(21) A machine gun is mounted on a $2000\,kg$ car on a horizontal frictionless surface. At some instant the gun fires bullets of mass $10\,gm$ with a velocity of $500\,m/sec$ with respect to the car. The number of bullets fired per second is ten. The average thrust on the system is ..... N

(A) 550 (B) 50 (C) 250 (D) 25

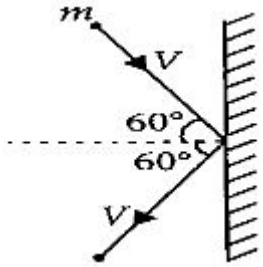
(22) In a rocket of mass $1000\,kg$ fuel is consumed at a rate of $40\,kg/s$. The velocity of the gases ejected from the rocket is $5 \times 10^4\,m/s$. The thrust on the rocket is

(A) $2 \times 10^3 N$ (B) $5 \times 10^4 N$ (C) $2 \times 10^6 N$ (D) $2 \times 10^9 N$

(23) Sand is being dropped on a conveyer belt at the rate of $2\,kg$ per second . The force necessary to keep the belt moving with a constant speed of $3\,ms^{-1}$ will be ..... N

(A) 12 (B) 6 (C) 0 (D) 18

(24) A rigid ball of mass m strikes a rigid wall at 60^o and gets reflected without loss of speed as shown in the figure. The value of impulse imparted by the wall on the ball will be

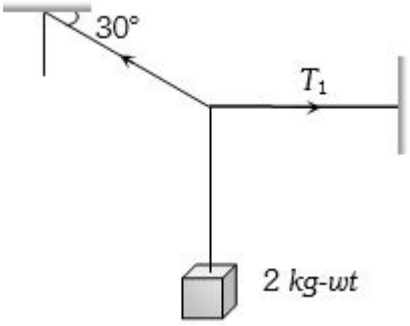


(A) $\frac{mv}{2}$ (B) $\frac{mv}{3}$ (C) mv (D) $2mv$

(25) A rope of length L is pulled by a constant force F. What is the tension in the rope at a distance x from the end where the force is applied

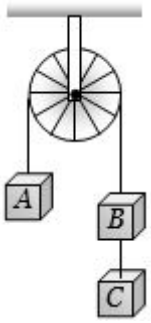
(A) $\frac{FL}{x}$ (B) $\frac{F(L-x)}{L}$ (C) $\frac{FL}{L-x}$ (D) $\frac{Fx}{L-x}$

(26) A body of weight $2\,kg$ is suspended as shown in the figure. The tension T_1 in the horizontal string (in kg wt) is



(A) $2/\sqrt{3}$ (B) $\sqrt{3}/2$ (C) $2\sqrt{3}$ (D) 2

(27) Three equal weights A, B and C of mass $2\,kg$ each are hanging on a string passing over a fixed frictionless pulley as shown in the figure The tension in the string connecting weights B and C is ..... N

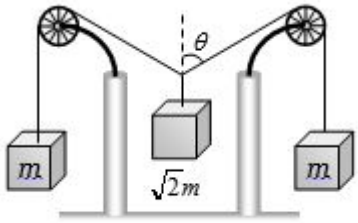


(A) 0 (B) 13 (C) 3.3 (D) 19.6

(28) Two masses $2\,kg$ and $3\,kg$ are attached to the end of the string passed over a pulley fixed at the top. The tension and acceleration are

(A) $\frac{7g}{8};\ \frac{g}{8}$ (B) $\frac{21g}{8};\ \frac{g}{8}$ (C) $\frac{21g}{8};\ \frac{g}{5}$ (D) $\frac{12g}{5};\ \frac{g}{5}$

(29) The pulleys and strings shown in the figure are smooth and of negligible mass. For the system to remain in equilibrium, the angle θshould be ..... ^{o}



(A) 0 (B) 30 (C) 45 (D) 60

(30) A person is standing in an elevator. In which situation he finds his weight less than actual when

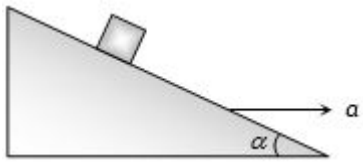
(A) The elevator moves upward with constant acceleration

(B) The elevator moves downward with constant acceleration.

(C) The elevator moves upward with uniform velocity

(D) The elevator moves downward with uniform velocity

(31) A block is kept on a frictionless inclined surface with angle of inclination 'α'. The incline is given an acceleration 'a' to keep the block stationary. Then a is equal to

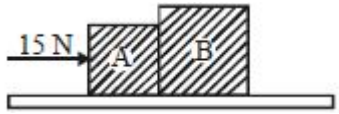


(A) g (B) $g\tan\alpha$ (C) $g/\tan\alpha$ (D) $g\,cosec\alpha$

(32) Three solids of masses m_1, m_2 and m_3 are connected with weightless string in succession and are placed on a frictionless table. If the mass m_3 is dragged with a force T, the tension in the string between m_2 and m_3 is

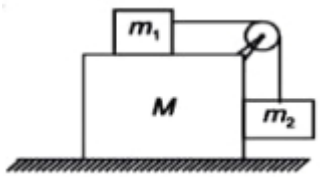
(A) $\frac{m_2}{m_1+m_2+m_3}T$ (B) $\frac{m_3}{m_1+m_2+m_3}T$ (C) $\frac{m_1+m_2}{m_1+m_2+m_3}T$ (D) $\frac{m_2+m_3}{m_1+m_2+m_3}T$

(33) On a smooth plane surface (figure) two block A and B are accelerated up by applying a force $15\,N$ on A. If mass of B is twice that of A, the force on B is ..... N



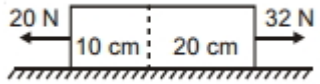
(A) 30 (B) 15 (C) 10 (D) 5

(34) In the given arrangement all surfaces are smooth. What acceleration should be given to the system, for which the block m_2 doesn't slide down?



(A) $\frac{m_2 g}{m_1}$ (B) $\frac{m_1 g}{m_2}$ (C) g (D) $\frac{m_2 g}{m_1+m_2}$

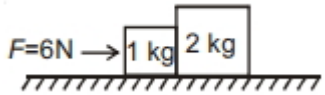
(35) Figure shows a uniform rod of length $30\,cm$ having a mass $3.0\,kg$. The rod is pulled by constant forces of $20\,N$ and $32\,N$ as shown. Find the force exerted by $20\,cm$ part of the rod on the $10\,cm$ part (all surfaces are smooth) is ..... N



(A) 36 (B) 12 (C) 64 (D) 24

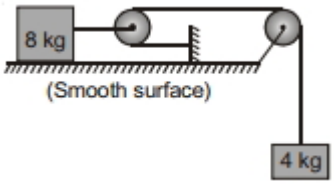
Physics - Section B (MCQ)

(36) Arrangement of two block system is as shown. The net force acting on $1\,kg$ and $2\,kg$ blocks are (assuming the surfaces to be frictionless) respectively



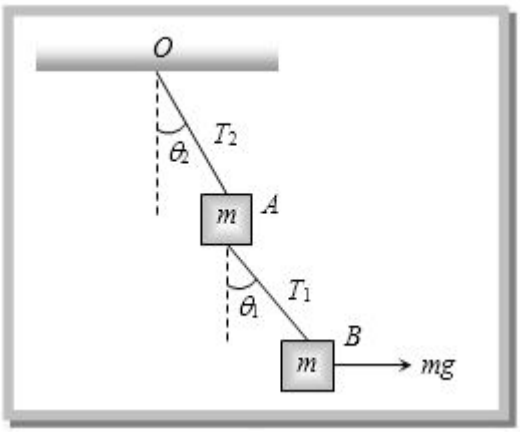
(A) $4\,N, 8\,N$ (B) $1\,N, 2\,N$ (C) $2\,N, 4\,N$ (D) $3\,N, 6\,N$

(37) If pulleys shown in the diagram are smooth and massless and a_1 and a_2 are acceleration of blocks of mass $4\,kg$ and $8\,kg$ respectively, then



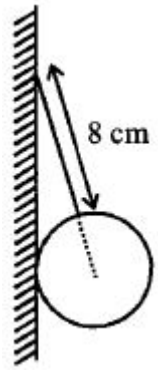
(A) $a_1 = a_2$ (B) $a_1 = 2a_2$ (C) $2a_1 = a_2$ (D) $a_1 = 4a_2$

(38) For given systen T_2 .....



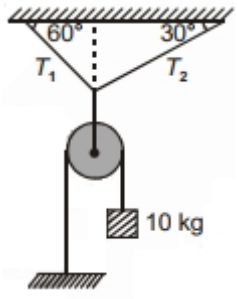
(A) mg (B) $\sqrt{2}\,mg$ (C) $\sqrt{3}\,mg$ (D) $\sqrt{5}\,mg$

(39) A uniform sphere of weight W and radius $5\,cm$ is being held by a string as shown in the figure. The tension in the string will be



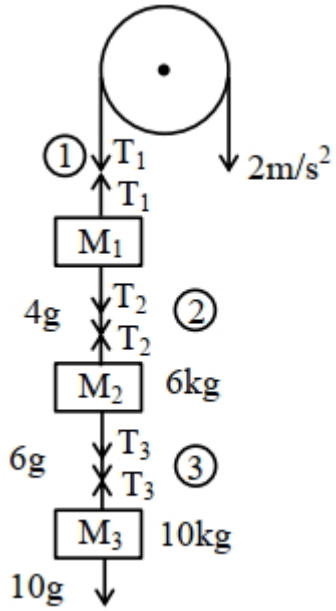
(A) $\frac{12}{5}\,W$ (B) $\frac{5}{12}\,W$ (C) $\frac{13}{5}\,W$ (D) $\frac{13}{12}\,W$

(40) In the arrangement as shown, tension T_2 is ..... N $(g = 10\,m/s^2)$



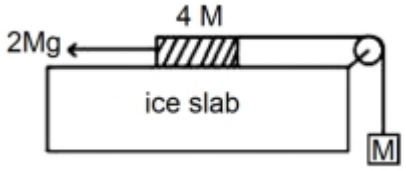
(A) 50 (B) 100 (C) $50\sqrt{3}$ (D) $100\sqrt{3}$

(41) Three blocks M_1, M_2, M_3 having masses 4 kg, 6 kg and 10 kg respectively are hanging from a smooth pully using rope 1,2 and 3 as shown in figure. The tension in the rope 1, T_1 when they are moving upward with acceleration of 2 ms^{-2} is ..... N (if g $= 10$ m/s^2)



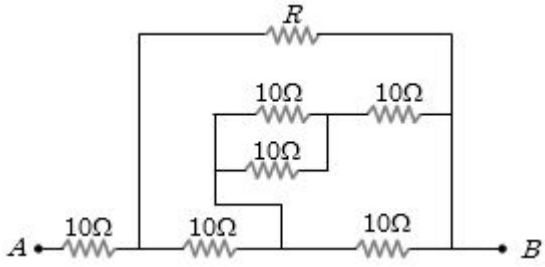
(A) 210 (B) 220 (C) 230 (D) 240

(42) A hanging mass M is connected to a four times bigger mass by using a string-pulley arrangement. as shown in the figure. The bigger mass is placed on a horizontal ice-slab and being pulled by $2\,Mg$ force. In this situation. tension in the string is $\frac{x}{5}\ Mg$ for $x =$ Neglect mass of the string and friction of the block (bigger mass) with ice slab. (Given $g =$ acceleration due to gravity)



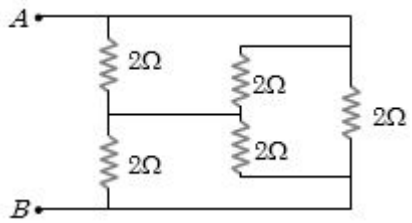
(A) 2 (B) 7 (C) 6 (D) 8

(43) For what value of R the net resistance of the circuit will be $18\,ohms$ ..... Ω



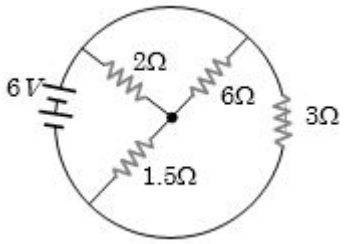
(A) 8 (B) 10 (C) 16 (D) 24

(44) Find the equivalent resistance across AB ..... Ω



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

(45) The total current supplied to the circuit by the battery is ..... A

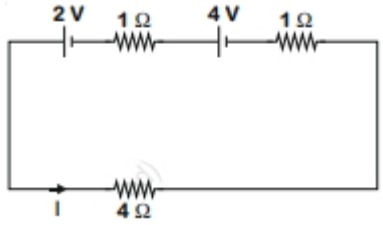


(A) 1 (B) 2 (C) 4 (D) 6

(46) A cell whose e.m.f. is $2\,V$ and internal resistance is $0.1\,\Omega$, is connected with a resistance of $3.9\,\Omega$. The voltage across the cell terminal will be V

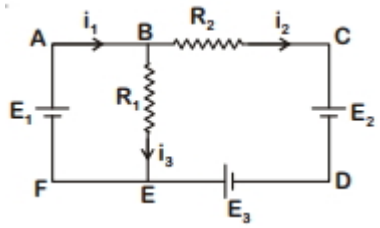
(A) 0.50 (B) 1.90 (C) 1.95 (D) 2

(47) For the circuit shown in the figure, the current I will be .....A



(A) 0.5 (B) 0.75 (C) 1 (D) 1.5

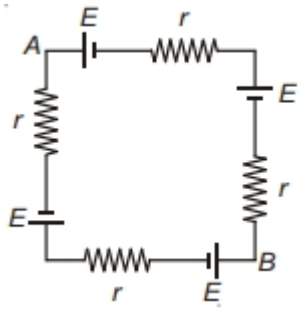
(48) For the circuit given below, the Kirchoff's loop rule for the loop $BCDEB$ is given by the equation



(A) $-i_2R_2 + E_2 + E_3 + i_3R_1 = 0$ (B) $-i_2R_2 + E_2 - E_3 + i_3R_1 = 0$

(C) $i_2R_2 + E_2 - E_3 - i_3R_1 = 0$ (D) $i_2R_2 + E_2 + E_3 + i_3R_1 = 0$

(49) Potential difference across AB in the network shown is .....



(A) 0 (B) E (C) $E - \frac{lr}{2}$ (D) $E - 2lr$

(50) A uniform wire of length l and radius r has a resistance of $100\,\Omega$. It is recast into a wire of radius $\frac{r}{2}$. The resistance of new wire will be ..... Ω

(A) 1600 (B) 400 (C) 200 (D) 100

(51) Which expression of rate of reaction is correct for a reaction $H_2 + I_2 \rightleftharpoons 2HI$?

(A) $-\frac{2d[H_2]}{dt} = -\frac{2d[I_2]}{dt} = +\frac{d[HI]}{dt}$

(B) $-\frac{d[H_2]}{2dt} = -\frac{d[I_2]}{2dt} = +\frac{d[HI]}{4dt}$

(C) $-\frac{d[H_2]}{dt} = -\frac{d[I_2]}{dt} = +\frac{d[HI]}{dt}$

(D) $-\frac{d[H_2]}{2dt} = -\frac{d[I_2]}{2dt} = +\frac{d[HI]}{dt}$

(52) The balanced equation for a reaction having rate of reaction

$+\frac{1}{3}\frac{d[Br_2]}{dt} = -\frac{d[BrO_3^-]}{dt} = -\frac{1}{5}\frac{d[Br^-]}{dt} = -\frac{1}{6}\frac{d[H^+]}{dt}$ is

(A) $Br_{2(aq)} + BrO_3^-{}_{(aq)} \rightarrow 5Br^-_{(aq)} + 6H^+_{(aq)}$

(B) $BrO_3^-{}_{(aq)} + 5Br^-_{(aq)} + 6H^+_{(aq)} \rightarrow 3Br_{2(aq)} + 3H_2O_{(l)}$

(C) $3Br_{2(aq)} \rightarrow BrO_3^-{}_{(aq)} + 5Br^-_{(aq)} + 6H^+_{(aq)}$

(D) $BrO_3^-{}_{(aq)} + 5Br^-_{(aq)} + 6H^+_{(aq)} \rightarrow 3Br_{2(aq)}$

(53) Which of the following statement is wrong for $4A + B \rightarrow 2C + 2D$?

(A) rate of production of C and D is same.

(B) rate of production of C is half than rate of consumption of A.

(C) rate of production of C is half than rate of consumption of B.

(D) The rate of consumption of B is one-fourth the rate of consumption of A.

(54) The rate of production of D in $2A + B \rightarrow 2C + 4D$ is 1.6×10^{-3} Ms^{-1}. Which of the following statement is true for this reaction ?

(A) $-\frac{d[B]}{dt} = 3.2 \times 10^{-3}$ Ms^{-1}

(B) $-\frac{d[A]}{dt} = 6.4 \times 10^{-3}$ Ms^{-1}

(C) $\frac{d[C]}{dt} = 8.0 \times 10^{-4}$ Ms^{-1}

(D) $-\frac{1}{2}\frac{d[A]}{dt} = 1.6 \times 10^{-3}$ Ms^{-1}

(55) For a reaction : $2N_2O_5 \rightarrow 4NO_2 + O_2$ the rate law can be presented in three different ways as follows, then which relation between K and K ' and K and K "holds ?

$\frac{-d[N_2O_5]}{dt} = K[N_2O_5]$ $\frac{d[NO_2]}{dt} = K'[N_2O_5]$ $\frac{d[O_2]}{dt} = K''[N_2O_5]$

(A) $K' = 2K$, $K'' = \frac{K}{2}$

(B) $K' = 2K$, $K'' = K$

(C) $K' = K$, $K'' = K$

(D) $K' = 2K$, $K'' = 2K$

(56) In a reaction : $BrO_3^-{}_{(aq)} + 5Br^-_{(aq)} + 6H^+_{(aq)} \rightarrow 3Br_{2(l)} + 3H_2O_{(l)}$ the rate of consumption of Br^- is 1.5×10^{-2} Ms^{-1} . The rate of consumption of H^+ and rate of production of Br_2 will be respectively .....

(A) $(5 \times 6)\ 1.5 \times 10^{-2}$, $(3 \times 6)\ 1.5 \times 10^{-2}$

(B) $\left(\frac{6}{5}\right)1.5 \times 10^{-2}$, $\left(\frac{3}{5}\right)1.5 \times 10^{-2}$

(C) $\left(\frac{5}{6}\right)1.5 \times 10^{-2}$, $\left(\frac{5}{3}\right) \times 1.5 \times 10^{-2}$

(D) $(5 + 6)\ 1.5 \times 10^{-2}$, $(3 + 6)\ 1.5 \times 10^{-2}$

(57) The change in concentration of hydrogen in a reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$ is -0.3×10^{-4} Ms^{-1}. The change in concentration of ammonia at that time is .....

(A) 0.2×10^{-4} (B) -0.2×10^{-4} (C) 0.1×10^{-4} (D) 0.3×10^{-4}

(58) The pressure of N_2O_4 in a reaction $N_2O_{4(g)} \rightarrow 2NO_{2(g)}$ reduces from 0.5 atm to 0.32 atm in 30 minutes. Find rate of production of NO_2.

(A) 0.012 atm min^{-1} (B) 0.024 atm min^{-1} (C) 0.006 atm min^{-1} (D) 0.003 atm min^{-1}

(59) In a reaction : $A + 2B \rightarrow C$, at a time t_1, $-\frac{d[A]}{dt} = 2.6 \times 10^{-2}$ M sec^{-1}, then at a time t_1, $-\frac{d[B]}{dt}$ = ... ?

(A) 2.6×10^{-2} (B) 5.2×10^{-2} (C) 1.0×10^{-1} (D) 6.5×10^{-3}

(60) In a reaction $H^+ + OH^- \rightarrow H_2O$, the time required for a decrease of 0.02 M in concentration of H^+ ions is 2 nano second. What will be the average rate of reaction ?

(A) 2 Ms^{-1} (B) 1×10^7 Ms^{-1} (C) 0·02 Ms^{-1} (D) 0.02×10^9 Ms^{-1}

(61) Which of the following is not an example of redox reaction ?

(A) $CuO + H_2 \longrightarrow Cu + H_2O$

(B) $Fe_2O_3 + 3CO \longrightarrow 2Fe + 3CO_2$

(C) $2K + F_2 \longrightarrow 2KF$

(D) $BaCl_2 + H_2SO_4 \longrightarrow BaSO_4 + 2HCl$

(62) Thiosulphate reacts differently with iodine and bromine in the reactions given below :

$2S_2O_3^{2-} + I_2 \rightarrow S_4O_6^{2-} + 2I^-$

$S_2O_3^{2-} + 2Br_2 + 5H_2O \rightarrow 2SO_4^{2-} + 2Br^- + 10\ H^+$

Which of the following statements justifies the above dual behaviour of thiosulphate ?

(A) Bromine is a stronger oxidant than iodine

(B) Bromine is a weaker oxidant than iodine.

(C) Thiosulphate undergoes oxidation by bromine and reduction by iodine in these reactions.

(D) Bromine undergoes oxidation and iodine undergoes reduction in these reactions.

(63) The oxidation number of an element in a compound is evaluated on the basis of certain rules. Which of the following rules is not correct in this respect ?

(A) The oxidation number of hydrogen is always +1.

(B) The algebraic sum of all the oxidation numbers in a compound is zero.

(C) An element in the free or the uncombined state bears oxidation number zero.

(D) In all its compounds, the oxidation number of fluorine is – 1 .

(64) In which of the following compounds, an element exhibits two different oxidation states.

(A) NH_2OH (B) NH_4NO_3 (C) N_2H_4 (D) N_3H

(65) Which of the following arrangements represent increasing oxidation number of the central atom ?

(A) CrO_2^- , ClO_3^- , CrO_4^{2-} , MnO_4^-

(B) ClO_3^- , CrO_4^{2-} , MnO_4^- , CrO_2^-

(C) CrO_2^- , ClO_3^- , MnO_4^- , CrO_4^{2-}

(D) CrO_4^{2-}, MnO_4^- , CrO_2^- , ClO_3^-

(66) The $IUPAC$ name of $CH_3-CH_2-\underset{\underset{Cl}{|}}{CH}-\underset{\underset{CH_3}{|}}{CH}-\underset{\underset{OH}{|}}{\overset{\overset{CH_3}{|}}{C}}-CH_3$ is

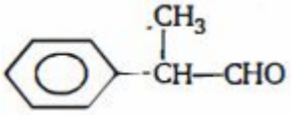
(A) $4-$ Chloro $-2,3-$ dimethylhexane $-2-$ ol

(B) $4-$ Chloro $-2-$ hydroxy $-2,3-$ dimethylhexane

(C) $4-$ Chloro $-1,1,2-$ trimethylpentan $-2-$ ol

(D) $3-$ Chloro $-2,3-$ dimethylhexane $-2-$ ol

(67) The $IUPAC$ name of is



(A) $2-$ Phenylpropan $-3-$ al (B) Formylethylbenzene (C) $2-$ Phenylpropanal (D) Ethylformylbenzene

(68) The $IUPAC$ name of $CH_2=\overset{\overset{CH_3}{|}}{C}-COOCH_3$ is

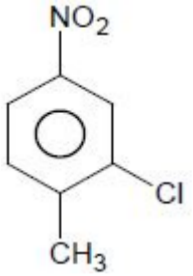
(A) Methyl $-2-$ methylprop $-1-$ en$-3-$ oate

(B) $2-$ Methoxycarb onylpropene

(C) $2-$ Methoxycarbonylprop $-2-$ ene

(D) Methyl $-2-$ methylprop $-2-$ enoate

(69) The correct $IUPAC$ name of the following compound is



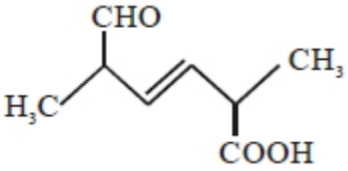
(A) $5-$ chloro $-4-$ methyl $-1-$ nitrobenzene

(B) $2-$ methyl $-5-$ nitro $-1-$ chlorobenzene

(C) $3-$ chloro $-4-$ methyl $-1-$ nitrobenzene

(D) $2-$ chloro $-1-$ methyl $-4-$ nitrobenzene

(70) The $IUPAC$ name for the following compound is:



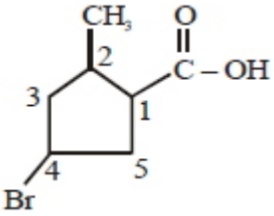
(A) $2,5-$ dimethyl$-6-$carboxy$-$hex$-3-$enal

(B) $6-$formyl$-2-$methyl$-$hex$-3-$enoic acid

(C) $2,5-$dimethyl$-5-$carboxy-hex$-3-$enal

(D) $2,5-$dimethyl$-6-$oxo$-$hex$-3-$enoic acid

(71) The $IUPAC$ name of the following compound is :



(A) $4-$Bromo$-2-$methylcyclopentane carboxylic acid

(B) $5-$Bromo$-3-$methylcyclopentanoic acid

(C) $3-$Bromo$-5-$methylcyclopentane carboxylic acid

(D) $3-$Bromo$-5-$methylcyclopentanoic acid

(72) The hydrocarbon with seven carbon atoms containing a neopentyl and a vinyl group is

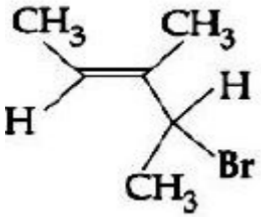
(A) $2,2-$ dimethyl $-4-$ pentene

(B) $4,4-$ dimethyl pentene

(C) Isopropyl $-2-$ butene

(D) $2,2-$ dimethyl $-3-$ pentene

(73) What is the $IUPAC$ name of the following compound ?



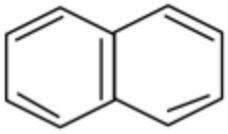
(A) $3-$ Bromo $-1,2-$ dimethylbut $-1-$ ene (B) $3-$ Bromo $-3-$ methyl $-1,2-$ dimethylprop $-1-$ ene

(C) $2-$ Bromo $-3-$ methylpent $-3-$ ene (D) $4-$ Bromo $-3-$ methylpent $-2-$ ene

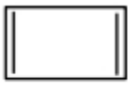
(74) A compound with a molecular formula of C_6H_{14} has two tertiary carbons. Its $IUPAC$ name is :

(A) $2-$ methylpentane (B) $2,3-$ dimethylbutane (C) $2,2-$ dimethylbutane (D) $n-$hexane

(75) Consider the following compounds/species:
The number of compounds/species which obey Huckel's rule is .....

(i) 

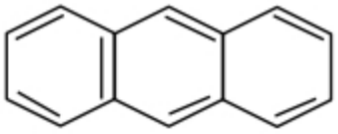
(ii) 

(ii) 

(iv) 

(v) 

(vi) 

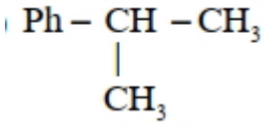
(vii) 

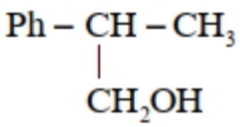
(A) 6 (B) 4 (C) 5 (D) 2

Chemistry - Section B (MCQ)

(76) The final product A, formed in the following reaction sequence is:

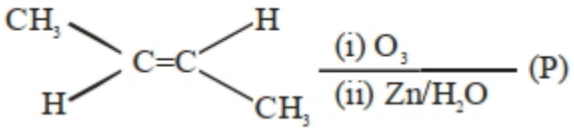
$$Ph-CH=CH_2 \xrightarrow[\text{(iii) HBr}(iv)\text{Mg},ether,then\text{HCHO/H}_3O^+]{(i)BH_3\ \text{(ii) H}_2O_2,^{(-)}\text{OH}} A$$

(A) $Ph-CH_2-CH_2-CH_3$ (B) 

(C) 

(D) $Ph-CH_2-CH_2-CH_2-OH$

(77) $Image$
Consider the given reaction. The total number of oxygen atoms present per molecule of the product (P) is_____



(A) 2 (B) 1 (C) 7 (D) 5

(78) The intermediate during the addition of HCl to propene in the presence of peroxide is

(A) $CH_3\overset{\bullet}{C}HCH_2Cl$ (B) $CH_3\overset{+}{C}HCH_3$ (C) $CH_3CH_2\overset{\bullet}{C}H_2$ (D) $CH_3CH_2\overset{+}{C}H_2$

(79) Products of the following reaction $CH_3C\equiv CCH_2CH_3 \xrightarrow[(2)\ Hydrolysis]{(1)\ O_3}$ ..... are

(A) $CH_3CHO+CH_3CH_2CHO$ (B) $CH_3COOH+CH_3CH_2CHO$

(C) $CH_3COOH+HOOCCH_2CH_3$ (D) $CH_3COOH+CO_2$

(80) $2-$ Hexyne gives trans $-2-$ Hexene on treatment with :

(A) Pt/H_2 (B) Li/NH_3 (C) $Pd/BaSO_4$ (D) $LiAlH_4$

(81) The increasing order of acidity among phenol, $p-$ methylphenol, $m-$ nitrophenol and $p-$ nitrophenol is

(A) $m-$ nitrophenol,$p-$ nitrophenol, phenol, $p-$ methylphenol

(B) $p-$ methylphenol, $m-$ nitrophenol, phenol,$p-$ nitrophenol

(C) $p-$ methylphenol, phenol, $m-$ nitrophenol, $p-$ nitrophenol

(D) Phenol, $p-$ methylphenol, $p-$ itrophenol,$m-$ nitrophenol

(82) On boiling with concentrated hydrobromic acid, phenyl ethyl ether will yield

(A) Phenol and ethyl bromide

(B) Phenol and ethane

(C) Bromobenzene and ethanol

(D) Bromobenzene and ethane

(83) The products formed in the following reaction are $C_6H_5-O-CH_3+HI \xrightarrow{\text{heat}}$

(A) C_6H_5-I and CH_3-OH

(B) C_6H_5-OH and CH_3-I

(C) $C_6H_5-CH_3$ and HOI

(D) C_6H_6 and CH_3OI

(84) Consider the following reaction :

Phenol $\xrightarrow{Zn\ dust} X \xrightarrow[Anhyd.\ AlCl_3]{CH_3Cl} Y \xrightarrow{Alkaline\ KMnO_4} Z$

the product Z is

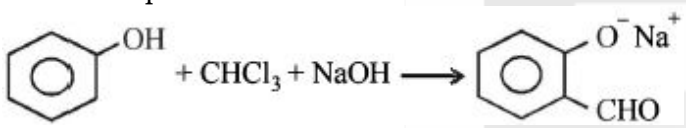
(A) benzaldehyde

(B) benzoic acid

(C) benzene

(D) toluene

(85) The electrophile involved in the below reaction is



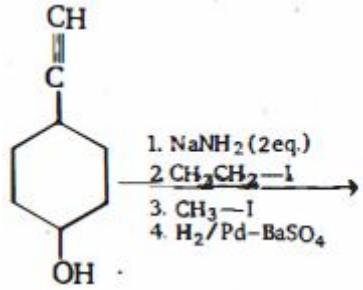
(A) trichloromethyl anion $(\overset{\ominus}{C}Cl_3)$

(B) formyl cation $(\overset{\oplus}{C}HO)$

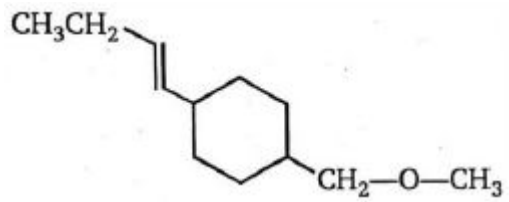
(C) dichloromethyl cation $(\overset{\oplus}{C}HCl_2)$

(D) dichlorocarbene $(:CCl_2)$

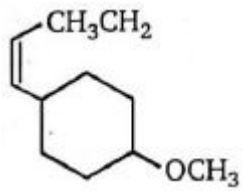
(86) Product (X) is



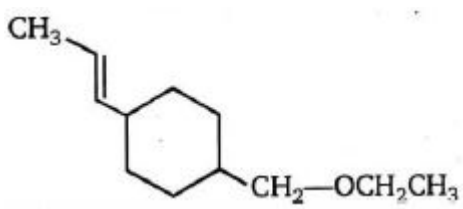
(A)



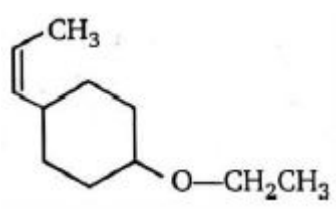
(B)



(C)



(D)



(87) Reaction between acetone and methylmagnesium chloride followed by hydrolysis will give :

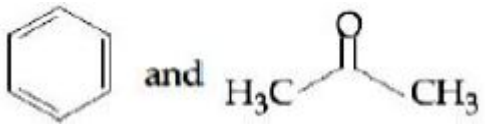
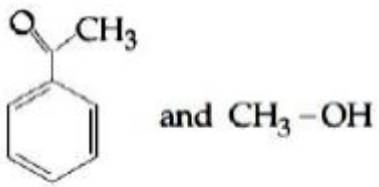
(A) Isobutyl alcohol (B) Isopropyl alcohol (C) Sec. butyl alcohol (D) Tert. butyl alcohol

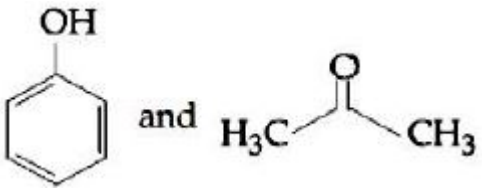
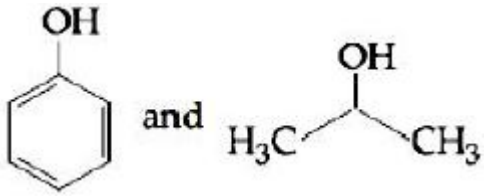
(88) Allyl phenyl ether can be prepared by heating

(A) $C_6H_5Br + CH_2 = CH - CH_2 - ONa$ (B) $CH_2 = CH - CH_2 - Br - C_6H_5ONa$

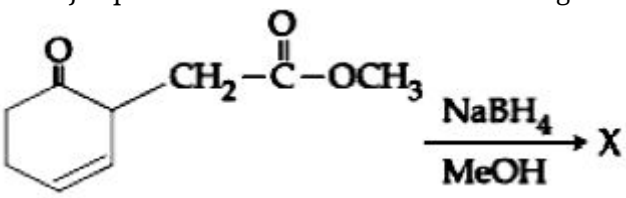
(C) $C_6H_5 - CH = CH - Br - CH_3 - ONa$ (D) $CH_2 = CH - Br - C_6H_5 - CH_2 - ONa$

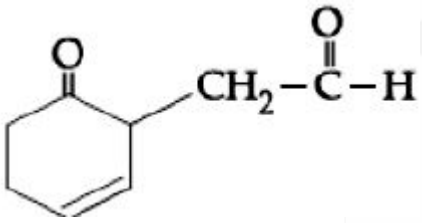
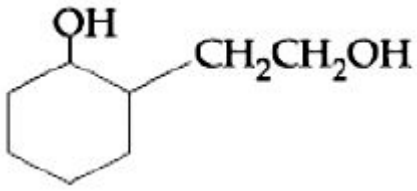
(89) The products formed in the reaction of cumene with O_2 followed by treatment with dil. HCl are

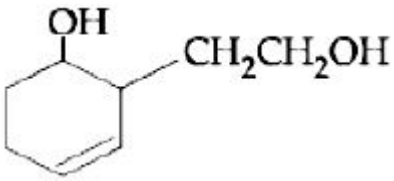
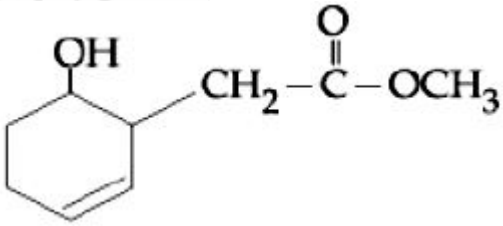
(A)  (B) 

(C)  (D) 

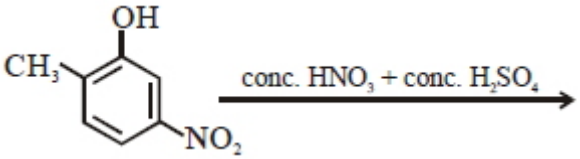
(90) The major product 'X' formed in the following reaction is

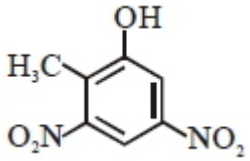
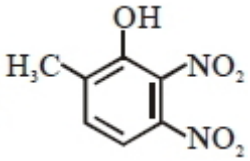
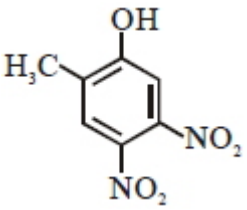
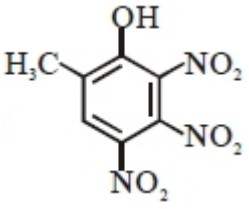


(A)  (B) 

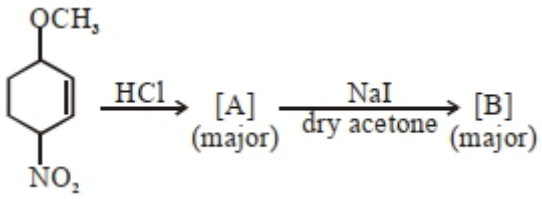
(C)  (D) 

(91) The major product of the following reaction is

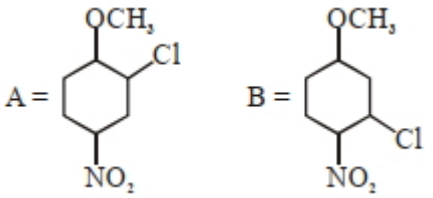


(A)  (B)  (C)  (D) 

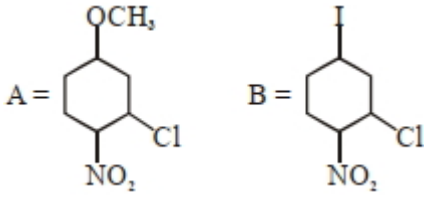
(92) Identify A and B in the chemical reaction.



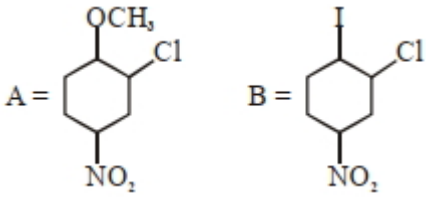
(A)



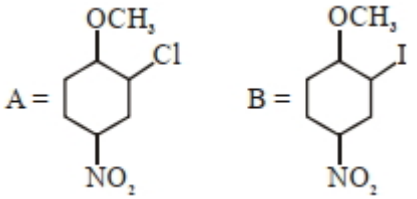
(B)



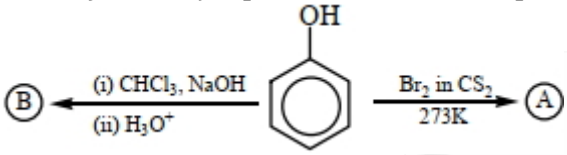
(C)



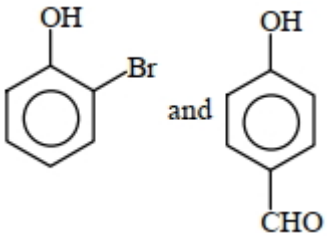
(D)



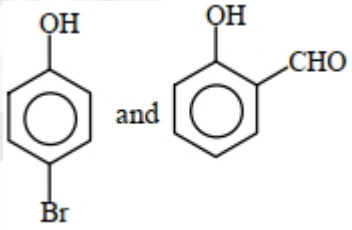
(93) Identify the major products A and B respectively in the following reactions of phenol.



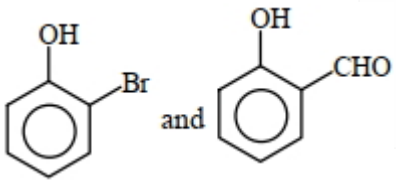
(A)



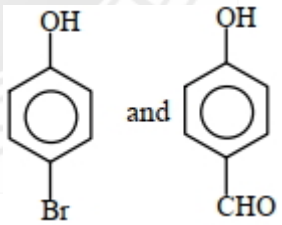
(B)



(C)



(D)



(94) Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
Assertion (A) : Synthesis of ethyl phenyl ether may be achieved by Williamson synthesis.
Reason (R) : Reaction of bromobenzene with sodium ethoxide yields ethyl phenyl ether.
In the light of the above statements, choose the most appropriate answer from the options given below:

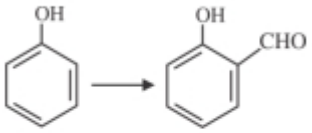
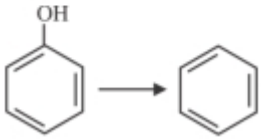
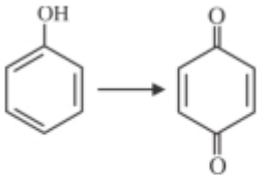
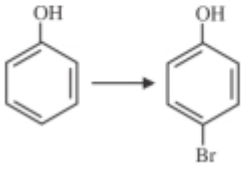
(A) Both (A) and (R) are correct and (R) is the correct explanation of (A)

(B) (A) is correct but (R) is not correct

(C) (A) is not correct but (R) is correct

(D) Both (A) and (R) are correct but (R) is NOT the correct explanation of (A)

(95) Match List I with List II.
Choose the correct answer from the options given below

List I	List II
A. 	I. Br_2 in CS_2
B. 	II. $Na_2Cr_2O_7/H_2SO_4$
C. 	III. Zn
D. 	IV. $CHCl_3/NaOH$

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

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

(96) The largest oxidation number exhibited by an element depends on its outer electronic configuration. Which which of the following outer electronic configurations the element will exhibit largest oxidation number ?

(A) $3d^14s^2$ (B) $3d^34s^2$ (C) $3d^54s^1$ (D) $3d^54s^2$

(97) Identify disproportionation reaction

(A) $CH_4 + 2O_2 \longrightarrow CO_2 + 2H_2O$

(B) $CH_4 + 4Cl_2 \longrightarrow CCl_4 + 4HCl$

(C) $2F_2 + 2OH^- \longrightarrow 2F^- + OF_2 + H_2O$

(D) $2NO_2 + 2OH^- \longrightarrow NO_2^- + NO_3^- + H_2O$

(98) Which of the following elements does not show disproportionation tendency ?

(A) Cl (B) Br (C) F (D) I

In the following questions a statement of assertion (A) followed by a statement of reason (R) is given. Choose the correct option out of the choices given below each question.

(99) Assertion (A) : Among halogens fluorine is the best oxidant.

Reason (R) : Fluorine is the most electronegative atom.

(A) Both A and R are true and R is the correct explanation of A

(B) Both A and R are true and R is not the correct explanation of A

(C) A is true but R is false.

(D) Both A and R are false.

(100) Assertion (A) : The decomposition of hydrogen peroxide to form water and oxygen is an example of disproportionation reaction .

Reason (R) : The oxygen of peroxide is in – 1 oxidation state and it is converted to zero oxidation state in O_2 and – 2 oxidation state in H_2O.

(A) Both A and R are true and R is the correct explanation of A

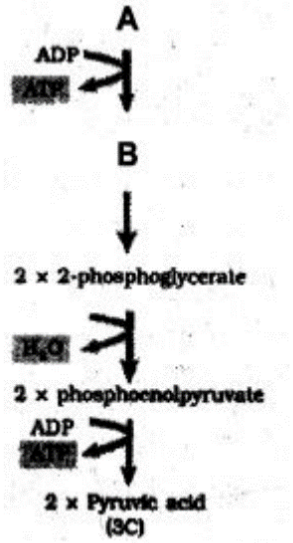
(B) Both A and R are true and R is not the correct explanation of A

(C) A is true but R is false.

(D) Both A and R are false.

Biology Section – A

(101) Identify A and B respectively.



(A) Fructose $1-6$ bi phosphate, oxalo acetate (B) $1,3-$ bi phosphoglyceric acid fructose $6-$phosphate

(C) $2 \times 1,3$ biphosphoglyceric acid, $2 \times 3-PGA$ (D) Acetaldehyde, glucose $1,6$ biophosphate.

(102) Phototropic curvature is the result of uneven 'Auxin' term is applied to the

(A) IBA (B) C_2H_4 (C) ABA (D) GA_3

(103) Photorespiration is a characteristic of which plant?

(A) C_4 (B) C_3 (C) CAM (D) All above

(104) Foolish seedling disease of rice led to the discovery of

(A) ABA (B) $2,4-D$ (C) IAA (D) GA

(105) What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid ?

(A) Six (B) Two (C) Eight (D) Four

(106) How many CO_2 are released during the 10 molecule of glucose at the aerobic respiration ?

(A) 10 (B) 60 (C) 30 (D) 120

(107) Abscission and dormancy are caused by

(A) ABA (B) NAA (C) IAA (D) IBA

(108) Plant growth is unique because

(A) Plant retains the capacity for unlimited growth throughout their life.

(B) Plant retains the capacity for limited growth.

(C) Plants have less growth that differs from animals.

(D) Plants growth is seen only in juvenile phase.

(109) Which sentence is given by Julius Von Sachs ?

(A) He proved that air is required for plant growth.

(B) He proved that in bright sunlight, small bubbles were formed around the green parts in aquatic plants.

(C) He found that the green parts in plants is where glucose is made and that the glucose is usually stored as starch.

(D) It represents that O_2 released from H_2O not from CO_2

(110) Photo synthesis is

(A) Physico-Chemical process (B) Chemical process

(C) Physical process (D) Catalylic process

(111) When growth is exemplified by a root elongation at a constant rate. Mathematically, it is expressed as

(A) $rt = L_1 + L_0$ (B) $W_1 = W_0.e^{rt}$ (C) $Lt = L_0 + rt$ (D) $W_0 = W_1.E^{rt}$

(112) Which hormone was first isolated from human urine ?

(A) Auxin (B) ABA (C) Ethylene (D) Gibberellic acid

(113) Match the following columns.

$Column - I$	$Column - II$
$A.Naturalauxin$	$1.IAA$
$B.Syntheticauxin$	$2.NAA$
	$3.IBA$
	$4.2 - 4 - D$

$A - B$

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

(114) Which effects are of gibberellins ?

(a) It help overcome the apical dominance
(b) Delay senescence, Thus the fruits can be left on the tree longer so as
(c) Increase in length of axis
(d) It is used to speed up the maltingprocess in brewing industries
(e) It induces parthenocarpy
(f) Promotes female flowers in cucumbers

(A) a, e, f (B) b, e, f (C) d, b, c (D) a, c, d

(115) Choose incorrect sentence.

(A) Natural cytokinins are synthesized in regions where rapid cell division occurs.

(B) Kinetin is a modified form of adenine, purine.

(C) Cytokinins induce parthenocarpy e.g. intomatoes

(D) Cytokinins promote nutrient mobilization which helps in the delay of leaf senescence.

(116) In photosynthesis process which molecule act as reaction center?

(A) Xanthophyll (B) Chlorophyll $-b$ (C) Carotenoid (D) Chlorophyll $-a$

(117) Respiration is an .....

(A) Endergonic process (B) Exergonic process (C) A and B both (D) None of the above

(118) Which of the following was isolated and identified by Skoog and Miller?

(A) Coconut milk (B) Kinetin (C) Zeatin (D) Yeast extract

The final structure at maturity of a cell/tissue is

(A) Type of cells (B) Type of cell division

(C) Location of cell within tissue (D) Nutrient in cells

(119) Choose odd one.

(A) Malic acid (B) PEP (C) Fumaric acid (D) Citric acid

(120) Which of these statements is incorrect?

(A) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.

(B) Enzymes of $TCAcycle$ are present in mitochondrial matrix.

(C) Oxidative phosphorylation takes place in outer mitochondrial membrane.

(D) Glycolysis occurs in cytosoal

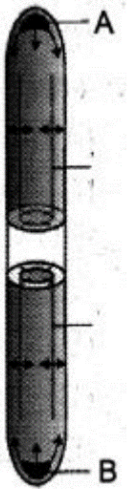
(121) Dwarfness can be controlled by treating the plant with

(A) Cytokinin (B) 'Gibberellic acid (C) Auxin (D) Ethylene

(122) For the observation of Kranz anatomy which plant is useful?

(A) Maize and cycas (B) Cycas and pinus (C) Maize and sugarcane (D) Sugarcane and pinus.

(123) Identify A and B in the given figure and choose the correct option.



(A) $A-$ Root apical meristem; $B-$ Shoot apical meristem
(B) $A-$ Shoot apical meristem; $B-$ Root apical meristem
(C) $A-$ Seed coat; $B-$ Radicle tissue
(D) $A-$ Radical tissue; $B-$ Root

(124) ABA acts as an antagonist to.....
(A) Inhibitor $-B$ (B) Zeatin (C) Auxin (D) GAs

(125) $A-$ ATPase is a multienzyme complex containing two parts F_0 and F_1
$R-$ The F_1 headpiece is a peripheral membrane protein complex and contains the site for synthesis of ATP from ADP.
(A) A and R both are correct.
(B) A and R both are incorrect.
(C) A is correct and R is incorrect.
(D) A is incorrect and R is correct.

(126) Seed dormancy is due to the
(A) Ethylene (B) Abscisic acid (C) IAA (D) Starch

(127) It is used to initiate flowering and for synchronizing fruit-set in pineapples.
(A) ABA (B) Ethylene (C) Kinetin (D) Gibberellin

(128) Choose correct sentences for glycolysis.
(1) Glycolysis occurs in the cytoplasm of the cell.
(2) During this one molecule of glucose is converted into two molecules of pyruvic acid.
(3) O_2 is not used in this phase.
(4) This phase is known as TCA.
(A) $2, 3, 4$ (B) $1, 2, 4$ (C) $1, 2, 3$ (D) $1, 3, 4$

(129) Which was discovered first ?
(A) GA_1 (B) GA_2 (C) GA_3 (D) GA_4

(130) How many molecules of ATP and $NADPH$ are required for every molecule of CO_2 fixed in the Calvin cycle?
(A) 2 molecules of ATP and 2 molecules of $NADPH$
(B) 3 molecules of ATP and 3 molecules of $NADPH$
(C) 3 molecules of ATP and 2 molecules of $NADPH$
(D) 2 molecules of ATP and 3 molecules of $NADPH$

(131) RQ of Tripalmitin is
(A) 0.7 (B) 0.9 (C) 1 (D) 0

(132) Plants follow .....A.... pathways in response to environment or phases of life to form different kind of structures. This ability is called ....B..... Complete the given statement with the correct combination of options.
(A) $A-$ same; $B-$ elasticity
(B) $A-$ elasticity; $B-$ same
(C) $A-$ different; $B-$ plasticity
(D) $A-$ same; $B-$ plasticity

(133) Oxidative phosphorylation is
(A) formation of ATP by transfer of phosphate group from a substrate to ADP
(B) oxidation of phosphate group in ATP
(C) addition of phosphate group to ATP
(D) formation of ATP by energy released from electrons removed during substrate oxidation.

(134) $A-$ The C_3 and C_4 plants respond differently to CO_2 concentrations.
$R-$ The concentration of CO_2 is between 0.03 and 0.04 percent. Increase in concentration upto 0.005 percent can cause an increase in CO_2 fixation rates.
(A) A and R both are correct. (B) A and R both are incorrect.
(C) A is correct and R is incorrect. (D) A is incorrect and R is correct.

(135) What amount of energy is released from glucose during lactic acid fermentation?
(A) More than 18% (B) About 10% (C) Less than 7% (D) Approximately 15%

Biology Section - B

(136) I. The increased growth per unit time is termedas ....A...
II. Abscisic acid .....B..... the stomata.
Choose the correct option and fill in the blanks.
(A) $A-$ Plasticity, $B-$ Close (B) $A-$ Growth rate, $B-$ open
(C) $A-$ Plasticity, $B-$ open (D) $A-$ Growth rate , $B-$ close

(137) The process of growth is maximum during
(A) Dormancy (B) Log phase (C) Lag phase (D) Senescence

(138) Which hormone promotes internode/petiole elongation in deep water rice?
(A) $2,4-D$ (B) GA_3 (C) Kinetin (D) Ethylene

(139) To remove seed dormancy, we can treat seed by using this chemical.
(A) Abscisic acid (B) Hydrochloric acid (C) Para ascorbic acid (D) Glberallic acid

(140) Growth in plants is measured by the increase in
I. Fresh weight. II. Dry weight
III. Length, area and volume IV. Cell number

(141) Choose the correct option.
(A) All except I and II (B) All except III (C) All except IV (D) I, II, III and IV

(142) Heterophylly can be observed in
I. cotton II. coriander
III. Larkspur
Select the right option
(A) I, II and III only (B) I and II only (C) II and III only (D) I and III only

(143) Select the correct sequence of reaction in glycolysis
(a) $3-$ phosphoglyceraldehyde
$1,3$ biphosphoglycerate
(b) 3- phosphoglyceric acid
$2-$ phosphoglycerate
(c) $1,3$ Biphosphoglyceric acid
$3-$ phosphoglyceric acid
(d) Splitting of $1,6-$ fructose biphosphate to dihydroxy acetone phosphate and
$3-$ phosphoglyceradehyde
(A) d, c, a, b (B) b, c, a, d (C) a, d, c, b (D) d, a, c, b

(144) It hastens fruit ripening in tomatoes and apples
(A) ABA (B) IAA (C) Ethylene (D) Cytokinine

(145) Which was the first product in light reaction of C_4 plants?
(A) Malic acid (B) Oxaloacetic acid (C) $3\,PGA$ (D) $PGAL$

(146) Identify the step in tricarboxylic acid cycle, which does not involve oxidation of substrate.
(A) Succinic acid $\rightarrow$ Malic acid (B) Succinyl-$CoA \rightarrow$ Succinic acid
(C) Isocitrate $\rightarrow \alpha$-ketoglutaric acid (D) Malic acid $\rightarrow$ Oxaloacetic acid

(147) In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as
(A) Senescence (B) Differentiation (C) Dedifferentiation (D) Development

(148) Match the columns.

$Column-I$	$Column-II$
$(a)4Ccompound$	$(1)AcetylCoA$
$(b)2Ccompound$	$(2)Pyruvate$
$(c)5Ccompound$	$(3)Citricacid$
$(d)3Ccompound$	$(4)\alpha-Ketoglutaticacid$
	$(5)Malicacid$

(A) $a-2, b-5, c-3, d-1$ (B) $a-5, b-1, c-4, d-2$
(C) $a-3, b-1, c-4, d-2$ (D) $a-5, b-3, c-1, d-2$

(149) In which reaction NAD^+ is not reduced to $NADH + H^+$?
(A) Pyruvate $\rightarrow$ Acetyl conenzyme A
(B) Citric acid $\rightarrow \alpha-$ Ketoglutaric acid
(C) Malic acid $\rightarrow$ Oxaloacetic acid
(D) Succinic acid $\rightarrow$ Malic acid

(150) It concerns with glycolysis
(A) Decarboxylase
(B) Lactate dehydrogenase
(C) Pyruvate dehydrgenase
(D) Hexokinase

Biology PART - A

(151) $A-$ The TCA cycle starts with the condensation of Acetyl group with OAA and water to yieldcitric acid
$R-$ Kreb's cycle occurs in cytoplasm of cell
(A) A and R both are correct.
(B) A and R both are incorrect.
(C) A is correct and R is incorrect.
(D) A is incorrect and R is correct.

(152) Chemiosmotic theory of ATP synthesis in mitochondrion is based on
(A) K^+ gradient (B) H^+ gradient (C) Na^+ gradient (D) Ca^{2+} gradient

(153) Choose incorrect sentence.
(A) The pigments are organized into two discrete photochemical light harvesting complexes (LHC) within the photosystem $II(PS-II)$.
(B) The LHC are made up of hundreds of pigment molecules bound to carbohydrates.
(C) The reaction center is different in both the photosystems.
(D) In photosystem II the reaction center absorbs $680\,nm$ wavelength of red light causing.

(154) Which of them is not an extrinsic factor?
(A) Light, O_2
(B) Temperature, CO_2
(C) Nutrient, water
(D) Growth regulator and genetic factor

(155) Maximum photosynthesis occurs in.....
(A) Red light (B) Green light (C) Pink light (D) Yellow light

(156) RuBisco is found in
(A) Cytoplasm (B) Nucleus (C) Mitochondria (D) Chloroplast

(157) The living differentiated cells, regain capacity of division under certain condition which called ....
(A) Redifferentiation (B) Dedifferentiation (C) Differentiation (D) Reverse division

(158) Which one of the following pairs, is not correctly matched?
(A) Gibberellic acid Leaf fall
(B) Cytokinin Cell division
(C) IAA Cell wall elongation
(D) Abscissic acid Stomatal closure

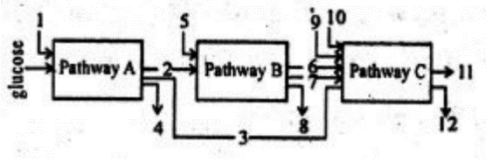
(159) It is the first process occurs in first phase of glycolysis.
(A) Glucose $\rightarrow$ Fructose
(B) Dehydrogenation of glucose
(C) Phosphorylation of glucose
(D) Glucose $\rightarrow$ Protein

(160) How many $NADH$ and $FADH$ are formed ? when one molecule of citric acid enters to TCA cycle ?
(A) $2\,NADH$ and $1\,FADH$
(B) $4\,NADH$ and $2\,FADH$
(C) $3\,NADH$ and $1\,FADH$
(D) $5\,NADH$ and $2\,FADH$

(161) In the expression, $W_1 = W_0 e^{rt}, W_1, W_0, r, t$ represent
$W_0 - W_1 - r - t$
(A) Initial size – Final size – Growth rate – Time – of growth
(B) Final size – initial size – Growth rate – Time of growth
(C) Final size – Initial size – Growth rate – Time of dividing
(D) Initial size – Final size – Growth rate – Time of dividing

(162) How many carbons are found in phosphoglycolate ?
(A) 4 (B) 5 (C) 3 (D) 2

(163) The three boxes in this diagram represents the three major biosynthetic pathways in aerobic respiration. Arrows represent net reactants or products. Arrows numbered $4, 8, 12$ can all be



(A) H_2O (B) ATP (C) FAD^+ or $FADH_2$ (D) $NADH$

(164) Which are incorrect sentences for non-cyclic photophosphorylation ?
(1) Z shape is formed when all the carriers are placed in a sequence on a redox potential scale.
(2) The $4e^-$ released are accepted by various electron acceptors and finally enter into $PS-II$ instead of returning to $PS-I$.
(3) In this process both $PS-I$ and $PS-II$ take part
(4) As the electrons released in various ways do not return to their original donors, such an electron transport is called non-cyclic electron transport.
(A) (1) and (3) (B) Only (3) (C) (1), (3) and (4) (D) Only (2)

(165) How many $ATPs$ can be made by $NADH$ when four pyruvic acids passes through the Krebs cycle?
(A) 24 (B) 60 (C) 4 (D) 18

(166) If one molecule of PEP is completely oxidize in glycolysis then how many total $ATPs$ are synthesized?
(A) 31 (B) 15 (C) 14 (D) 16

(167) The cells in this zone, attain their maximal size in terms of wall thickening and protoplasmic modifications.
(A) Maturation phase (B) Cell division and cell elongation zone
(C) Elongation zone (D) Cell division zone

(168) F. Skoog discovered
(A) Ethaphon (B) Auxin (C) Gibberellin (D) Kinetin

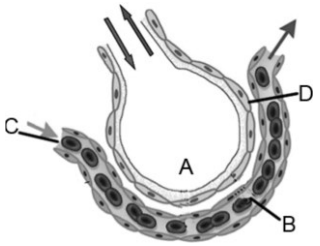
(169) Choose incorrect sentence. (For C_4- plants)
(A) The particularly large cells around the vascular bundles of the C_4 pathway plants are called bundle sheath cells.
(B) The light reaction takes place in mesophyll cells while CO_2 fixation occurs in bundle sheath cells.
(C) In C_4 plants bundle sheath cells are having thick walls, imprevious to gaseous exchange and intercellular spaces.
(D) The chloroplasts in mesophyll cells exhibit granna organization.

(170) In which one of the following processes CO_2 is not released?
(A) Aerobic respiration in plants (B) Aerobic respiration in animals
(C) Alcoholic fermentation (D) Lactate fermentation

(171) Which one of the following acids is a derivative of carotenoids?
(A) Indole-3-acetic acid (B) Gibberellic acid (C) Abscisic acid (D) Indole butyric acid

(172) It is $6C$ compound
(A) $\alpha-$ ketoglutaric acid (B) Oxalo acetic acid (C) Malic acid (D) Citric acid

(173) The figure given below shows a small part of human lung where exchange of gases takes place. Select the option which represents labelled part $(A, B, C$ or $D)$ correctly identified along with its function.



(A) C : arterial capillary passes oxygen to tissues
(B) A : alveolar cavity main site of exchange of respiratory gases
(C) D : capillary wall exchange of O_2 and CO_2 takes place here
(D) B : red blood cells transport of CO_2 mainly.

(174) Choose correct option.

Column -I	Column -II
(p) Sponges	(I) Through tracheal tubes
(q) Insects	(II) Through lungs
(r) Molluscs	(III) Vascularized gills
(s) Reptiles	(IV) Simple diffusion over their entire body surface
	(V) by their moist cuticle

$p-q-r-s$
(A) $I-III-IV-V$ (B) $IV-I-III-II$ (C) $II-III-IV-I$ (D) $I-II-III-IV$

(175) Which hormone is primarily responsible for promoting cell elongation & root growth ?
(A) Auxin (B) GA (C) Cytokinin (D) ABA

(176) What is the role of cytokinin's phototropism & how do they bring about bending of stems forwards light?
(A) Cytokinin's promote cell elongation on the darker side
(B) Cytokinin's inhibit cell elongation on the lighter side
(C) Cytokinin's have no role in phototropism
(D) Cytokinin's promote cell division on the lighter side

(177) How do gibberellins regulate seed germination & what is the effect of their excess or deficiency?
(A) Gibberellins promote seed dormancy, excess cause over dormancy, deficiency cause under dormancy
(B) Gibberellins inhibit seed germination, excess cause under germination, deficiency cause over germination
(C) Gibberellins have no role in seed germination regulation
(D) Gibberellins promote seed germination excess cause over germination, deficiency cause under germination.

(178) A tree grow 5 cm/ years what will be the height of the board fixed 10 cm above base after 10 years?
(A) 50 cm (B) 60 cm (C) 70 cm (D) 10 cm

(179) How many complex involve in ETS?
(A) 4 (B) 5 (C) 2 (D) 7

(180) Which of the following pigment absorbs light in the blue violet region of the spectrum?
(A) Chlorophyll a (B) Chlorophyll b (C) Chlorophyll c (D) Chlorophyll d

(181) What is the byproduct of the light dependent reaction that is used to generate ATP & NADPH?
(A) Oxygen (B) Glucose (C) ATP (D) Proton gradient

(182) Which of the following factors can increase the rate of respiration in plants?
(A) High temperature (B) Low oxygen levels (C) High light intensity (D) Water stress

(183) The partial pressures (in mm Hg) of oxygen (O_2) and carbon dioxide (CO_2) at alveoli (the site of diffusion) are:
(A) $pO_2 = 104$ and $pCO_2 = 40$
(B) $pO_2 = 40$ and $pCO_2 = 45$
(C) $pO_2 = 95$ and $pCO_2 = 40$
(D) $pO_2 = 159$ and $pCO_2 = 0.3$

(184) Asthma is a respiration disease concerned with
(A) Infection in alveolar wall
(B) Inflammation of brochi and brochioles
(C) Proliferation of fibrous tissue
(D) Infection in lungs

(185) The thoracic chamber is formed of .....
(A) Ribs and sternum
(B) Ribs and vertebral column
(C) Sternum and Piapharm
(D) Verterbral column, sternum, ribs and diaphram.

Biology PART – B

(186) Match the items given in Column I with those in Column II and select the correct option given below"

Column I	Column II
(a)Tidal volume	(i) $2500-3000\,mL$
(b)Inspiratory Reserve volume	(ii) $1100-1200\,mL$
(c)Expiratory Reserve volume	(iii) $500-550\,mL$
(d) Residual volume	(iv) $1000-1100\,mL$

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

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

(187) Intercostal muscles occur in

(A) abdomen (B) thigh (C) ribs (D) diaphargm

(188) $TV+IRV+ERV=$ .....

(A) $IRV+ERV$ (B) $EC+TLC$ (C) VC (D) $TLC+RV$

(189) Haemoglobin is red colored iron containing pigment present is $RBCs$, O_2 bind with it in reversible manner to form.....

(A) Haemoglobin (B) Carbamino - haemoglobin

(C) Oxyhaemoglobin (D) Bicarbonate

(190) Outer pleural membrane is in close contact with the . . . ..

(A) Surface of lungs (B) Thoracic lining (C) Alveoli (D) None of the above

(191) Under normal physiological conditions in human being every $100ml$ of oxygenated blood can deliver ml of O_2 to the tissues.

(A) $5\,ml$ (B) $4\,ml$ (C) $10\,ml$ (D) $2\,ml$

(192) Which structure opens in alveolar sac ?

(A) Primary bronchus (B) Terminal bronchiole (C) Tertiary bronchus (D) None of above

(193) Due to increasing air-borne allergens and pollutants, many people in urban areas are suffering from respiratory disorder causing wheezing due to

(A) benign growth on mucous lining of nasal cavity.

(B) inflammation of bronchi and bronchioles.

(C) proliferation of fibrous tissues and damage of the alveolar walls.

(D) reduction in the secretion of surfactants by pneumocytes.

(194) .....% of O_2 transported through the plasma in a dissolved state and nearly .....% of CO_2 is transported by RBC, whereas .....% of CO_2 is carried as bicarbonate.

(A) $97\%, 70\%, 20-25\%$ (B) $3\%, 20-25\%, 70\%$ (C) $7\%, 3\%, 20-25\%$ (D) $20-25\%, 3\%, 70\%$

(195) Select the correct events that occur during inspiration.

(a) Contraction of diaphragm
(b) Contraction of external inter-costal muscles
(c) Pulmonary volume decreases
(d) Intra pulmonary pressure increases

(A) only (d) (B) (a) and (b) (C) (c) and (d) (D) (a), (b) and (d)

(196) A man breath 12 time in a minute during this he achieves 2 time $TLC.$ so what amount of total air this man has inspired ?

(A) $15,200$ to $16,600$ (B) $13,500$ થી $14,300$ (C) $10,200$ થી $12,500$ (D) None

(197) Which of the following factors are favourable for the formation of oxyhaemoglobin in alveoli?

(A) High pO_2 and Lesser H^+concentration (B) Low pCO_2 and High H^+concentration

(C) Low pCO_2 and High temperature (D) High pO_2 and High pCO_2

(198) $A = CO_2$ is carried in the plasma mainly as HCO_3^- ions.
$R =$ Carbonic anhydrase catalyzes the formation of HCO_3^- ions.

(A) A is true and R is false (B) A is false and R is true (C) Both A and R are true (D) Both A and R are false

(199) Functional residual capacity includes.

$(1)\ TV$ $(2)\ IRV$
$(3)\ RV$ $(4)\ ERV$

(A) 1 and 3 (B) 3 and 4 (C) 1 and 4 (D) $1, 2, 3$ and 4

(200) Choose incorrect one.

(A) Nasal chamber opens into nasopharynx

(B) Larynx is bony box

(C) During swallowing epiglottis to prevent the entry of food into the larynx.

(D) Trachea is divides at the level of 5^{th} thoracic vertebra.