PHYSICS

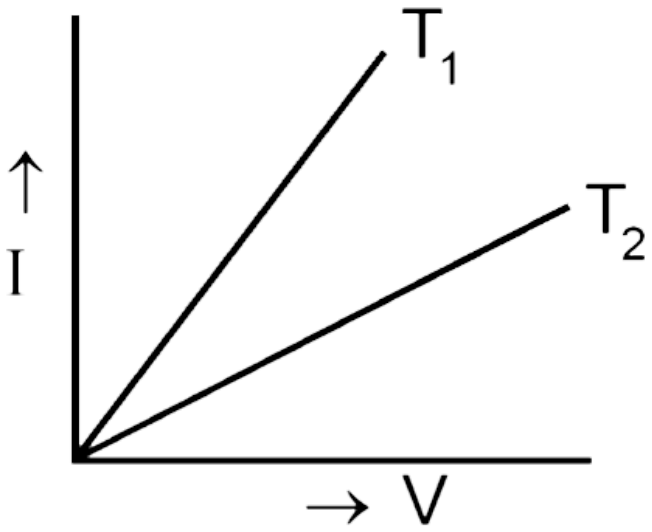
BOOKS - CAREER POINT

MOCK TEST 6

Part A Pysics

1. The current (I) and voltage (V) graphs for a given metallic wire at two different temperature (T_1) and (T_2) are shown in fig. It

is concluded that



A. $T_1 < T_2$

B. $T_1 > T_2$

C. $T_1 = T_2$

D. $T_1 = 2T_2$

Answer: B

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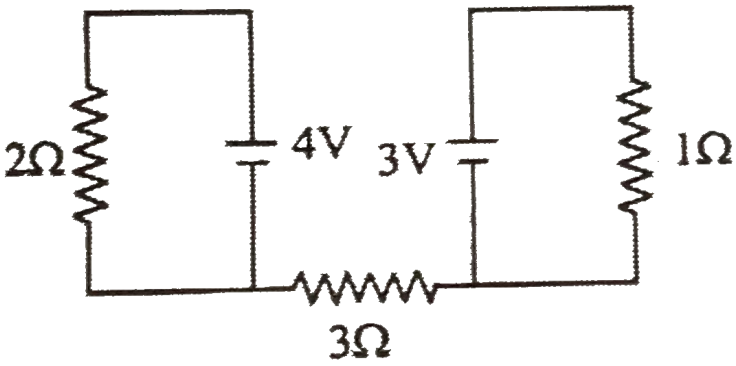
Part A Physics

1. The potential difference through the 3ω resitor shown in figure is -



A. zero

B. 1V

C. 3.5V

D. 7V

Answer: A

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2. The equation for a wave travelling in x-direction on a string is :

$$y = (3cm)\sin\left[\left(\pi cm^{-1}\right)x - (314)s^{-1}t\right]$$

Then find acceleration of a particle at $x = 6$ cm at $t = 0.11$ sec-

A. $2952 cm / s^2$

B. $5904 cm / s^2$

C. $2952 m / s^2$

D. zero

Answer: D

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3. A source and a detector moveaway fro each other, each with a speed of $10ms^{-1}$ with respect to the grond with no wind. If the detector detects a frequency 1950 Hz of the sound coming from thesorce, what is the original frequency of the source? Speed of sound in air $= 340ms^{-1}$.

A. $2070Hz$

B. $2000Hz$

C. $3000Hz$

D. None of these

Answer: A

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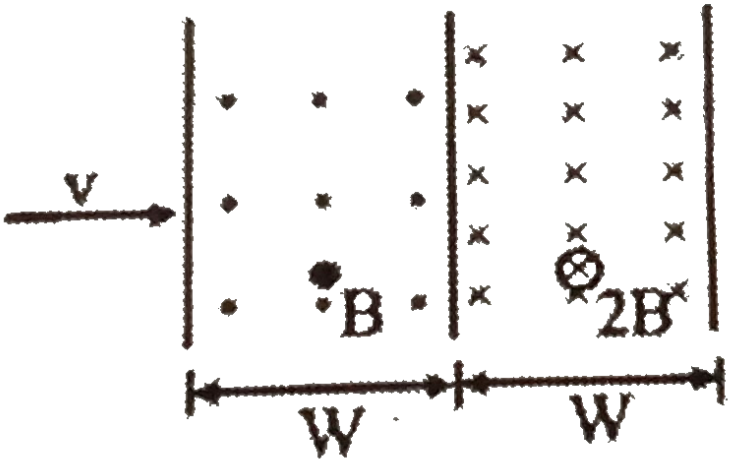
4. the magnetic field shown in the figure consist of the two magnetic fields.



If v is the velocity just required for a charge particles of mass m and charge q to pass through the magnetic field. Particle is projected with velocity 'v' then how much time does such a charge spend in the magntic filed-

A. $\frac{\pi m}{2qB}$

B. $\frac{\pi m}{qB}$

C. $\frac{\pi m}{4qB}$

D. $\frac{3\pi m}{2qB}$

Answer: B

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5. Points A and B are situated perpendicular to the axis of a $2cm$ long bar magnet at large distances X and $3X$ from its centre on opposite sides. The retio of the magnetic fields at A and B wil be approximately equal to

A. $27:1$

B. $1:27$

C. $9:1$

D. $1:9$

Answer: A

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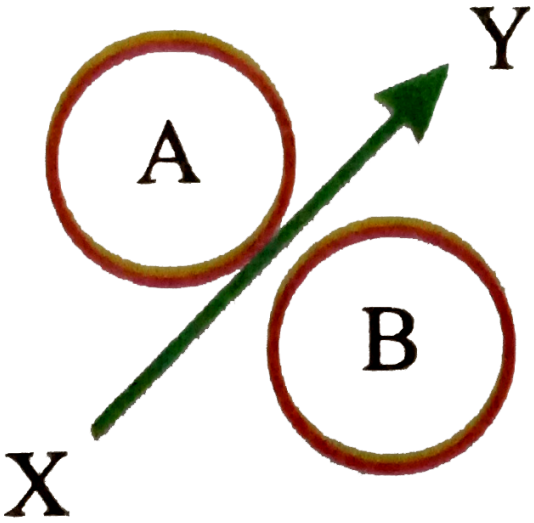
6. Consider the situation shown in the figure. If the current I in the long straight conducting wire XY is increased at a steady rate then the

induced $e.m.f.$'s in loop A and B will be



A. clockwise in A, anticlockwise in B

B. anticlockwise in A, clockwise in B

C. clockwise in both A and B

D. anticlockwise in both A and B

Answer: A

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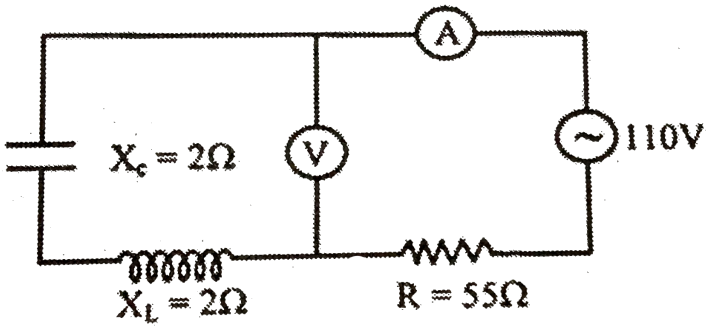
7. The reading of the ammeter and voltmeters are (Both the instruments are ac meters and measures rms value)-



A. $2A, 110V$

B. $2A, 0V$

C. $2A, 55V$

D. $1A, 0V$

Answer: B

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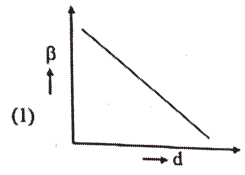
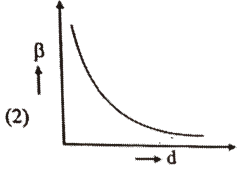
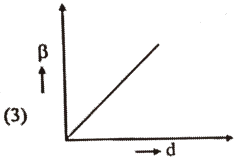
8. The correct curve between fringe width β and distance between the slits (d) is figure is -

A. 

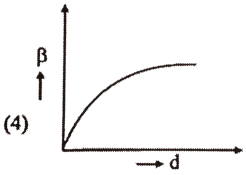
B.



C.



D.



Answer: B

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9. Plane microwaves are incident on a long slit having a width of 5.0 cm. Calculate the wavelength of the microwaves if the first diffraction minimum is formed at $\theta = 30^{\circ}$.

A. $2.5cm$

B. $2cm$

C. $25cm$

D. $2mm$

Answer: A

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10. Two particles are executing SHM in a straight line. Amplitude A and the time period T of both the particles are equal. At time t=0, one particle is at displacement $x_1 = +A$ and the other $x_2 = \left(-\frac{A}{2}\right)$ and they are approaching towards each other. After what time they across each other? $\frac{T}{4}$

A. $T/3$

B. $T/4$

C. $5T/6$

D. $T/6$

Answer: D

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11. A and B are two soap bubbles. Bubble A is larger than B. If these are now joined by a tube then

A. the bubble A becomes more large

B. the bubble B becomes more large

C. both the bubbles acquires the same size

D. both the bubbles will get bursted

Answer: A

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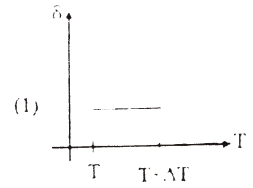
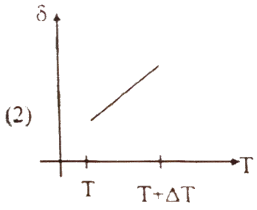
12. An ideal gas is initially at temperature T and volume V. Its volume is increased by ΔV due to an increase in temperature ΔT,

pressure remaining constant. The quantity $\delta = \frac{\Delta V}{V \Delta T}$ varies with temperature as

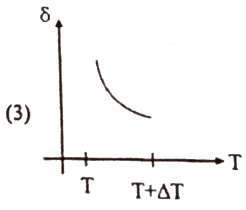
A.



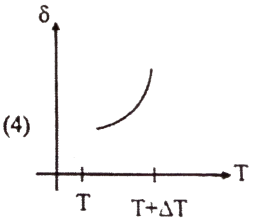
B.



C.



D.



Answer: C

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13. For an ideal gas, the heat capacity at constant pressure is larger than that at constant volume because

A. work has to be done against intermolecular forces as the gas expands

B. work has to be done against external pressure as the gas expands

C. the molecules gain rotational kinetic energy as the gas expands

D. the molecules move faster when best is supplied at constant pressure than when supplied at constant volume

Answer: B

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14. A body X at an original temperature $100^\circ C$ and another body at an original temperature $0^\circ C$ and placed in an evacuated conclosure, the walls of which are maintained at $10^\circ C$. Which one of the following statement is consistent with Prevost's theory ?

A. X emits but does not absorb heat

B. Y absorb but does not emit heat

C. The final temperature of the bodies will be the mean of their initial temperature

(i.e., $50^\circ C$)

D. The walls of the enclosure radiate heat to both X and Y

Answer: C

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15. Maximum kinetic energy of a photoelectron is E when the wavelength of incident light is λ. If energy becomes four times when

wavelength is reduced to one third, then work function of the metal is

A. $\frac{3hc}{\lambda}$

B. $\frac{hc}{3\lambda}$

C. $\frac{hc}{\lambda}$

D. $\frac{hc}{2\lambda}$

Answer: B

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16. In an excited state of hydrogen like atom an electron has total energy of $-3.4eV$. If the kinetic energy of the electron is E and its de-Broglie wavelength is λ, then

A. $\lambda = 6.6\text{Å}$

B. $E = 3.4eV$

C. both are correct

D. both are wrong

Answer: C

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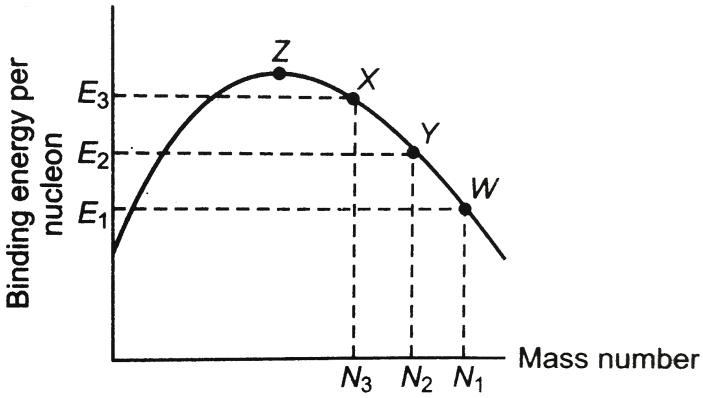
17. Consider the nuclear fission reaction $W \rightarrow X + Y$. What is the $Q - value$ (energy released) of the reaction?



A. $E_1N_1 - (E_2N_2 + E_3N_3)$

B. $(E_2N_2 + E_3N_3 - E_1N_1)$

C. $E_2N_2 + E_1N_1 - E_3N_3$

D. $E_1N_1 + E_3N_3 - E_2N_2$

Answer: B

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18. Two identical samples (same material and same amout) P and Q of a radioactive substance having mean life T are observed to have activities A_P and A_Q respectively at the

time of observation. If P is older than Q, then the difference in their age is

A. $T\ln\left(\frac{A_P}{A_Q}\right)$

B. $T\ln\left(\frac{A_Q}{A_P}\right)$

C. $T\left(\frac{A_P}{A_Q}\right)$

D. $T\left(\frac{A_Q}{A_P}\right)$

Answer: B

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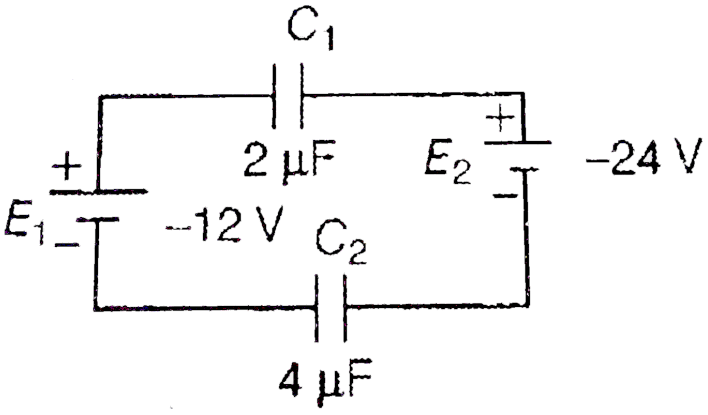
19. Two capacitors C_1 and C_2 are connected in a circuit as shown in figure. The potential difference $(V_A - V_B)$ is



A. $8V$

B. $-8V$

C. $12V$

D. $-12V$

Answer: B

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20. A charged sphere of diameter 4 cm has a charge density of $10^{-4}\text{coulmb}/cm^2$. The work done in joule when a charge of 40 nano-columbs is moved from infinity to a point which is at a distance of 2 cm from the surface of the sphere is-

A. 14.4π

B. 28.8π

C. 144π

D. 288π

Answer: A

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21. A person measures two quantities as $A = 1.0m \pm 0.2m, B = 2.0m \pm 0.2m$ We should report correct value for $\sqrt{AB}$ as

A. $1.4m \pm 0.4m$

B. $1.11m \pm 0.15m$

C. $1.4m \pm 0.3m$

D. $1.4m \pm 0.2m$

Answer: D

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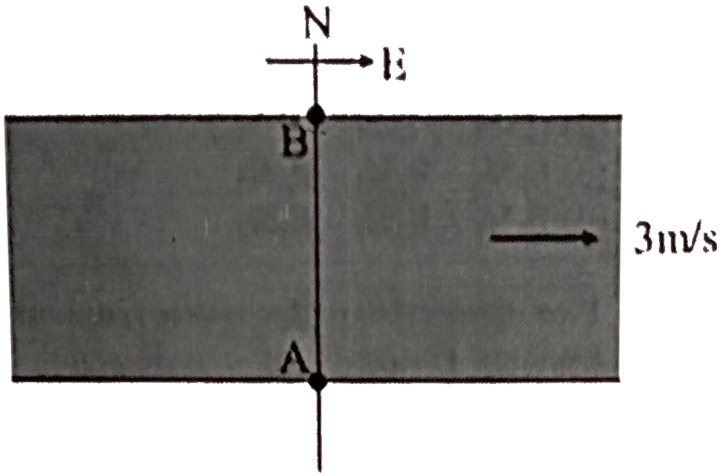
22. A river is flowing due east with a speed $3m/s$. A wimmer can swim in still water at a speed of $4m/s$. If swimmer starts swimming

due north, what will be his resultant velocity (magnitude and direction) ?



A. $5m/s$ at 37° to N

B. $5m/s$ at 53° to N

C. $10m/s$ at 37° to N

D. None of these

Answer: A

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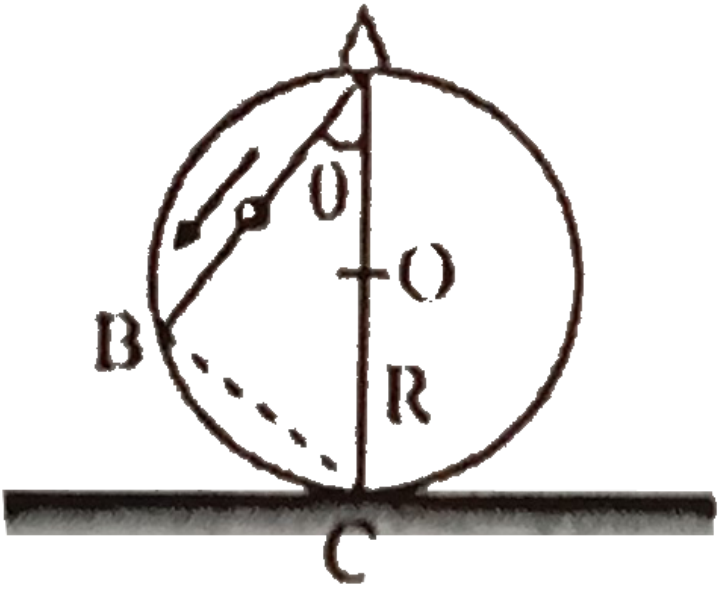
23. A friction wire AB is fixed on a sphere of radius R. A very small spherical ball slips on this wire. The time taken by the ball to slip

from A to B.



A. $\frac{2\sqrt{gR}}{g\cos\theta}$

B. $2\sqrt{gR}\frac{\cos\theta}{g}$

C. $2\sqrt{\frac{R}{g}}$

D. $\frac{gR}{\sqrt{g\cos\theta}}$

Answer: C

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24. A particle of mass 1 kg is moving along the line $y = x + 2$ (here x and y are in metres) with speed $2m/s$. The magnitude of angular momentum of paticle about origin is -

A. $4kg - m^2/s$

B. $2\sqrt{2}kg - m^2/s$

C. $4\sqrt{2}kg - m^2/s$

D. $2kg - m^2 / s$

Answer: B

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25. A loop of radius 3 meter and weighs $150kg$. It rolls along a horizontal floor so that its centre of mass has a speed of $15cm / \sec$. How much work has to be done to stop it -

A. $3.375J$

B. $7.375J$

C. $5.375J$

D. $9.375J$

Answer: A

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26. If two bodies of mass M and m are revolving around the centre of mass of the system in circular orbits of radii r and r

respectively due to mutual interaction. Which of the following formulee is applicable ?

A. $\frac{GMm}{(R+r)^2} = m\omega^2 r$

B. $\frac{GMm}{R^2} = m\omega^2 r$

C. $\frac{GMm}{r^2} = m\omega^2 R$

D. $\frac{GMm}{R^2+r^2} = m\omega^2 r$

Answer: A

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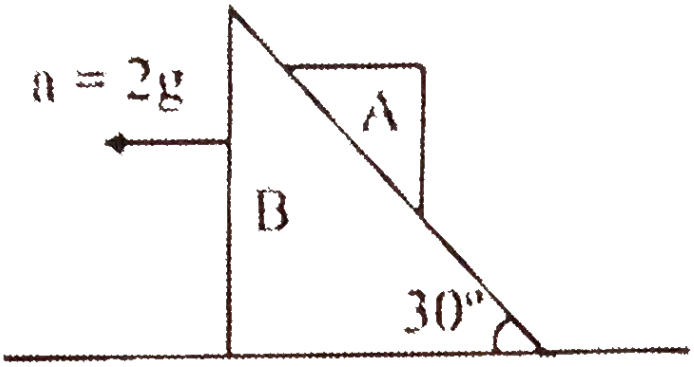
27. Wedge B is pulled by an acceleration 2g towards left. Find the acceleration of block A-



A. $g\sin 30^\circ + 2g\cos 30^\circ$

B. g downwards

C. $2g$ towards right

D. $g\sqrt{5}$

Answer: B

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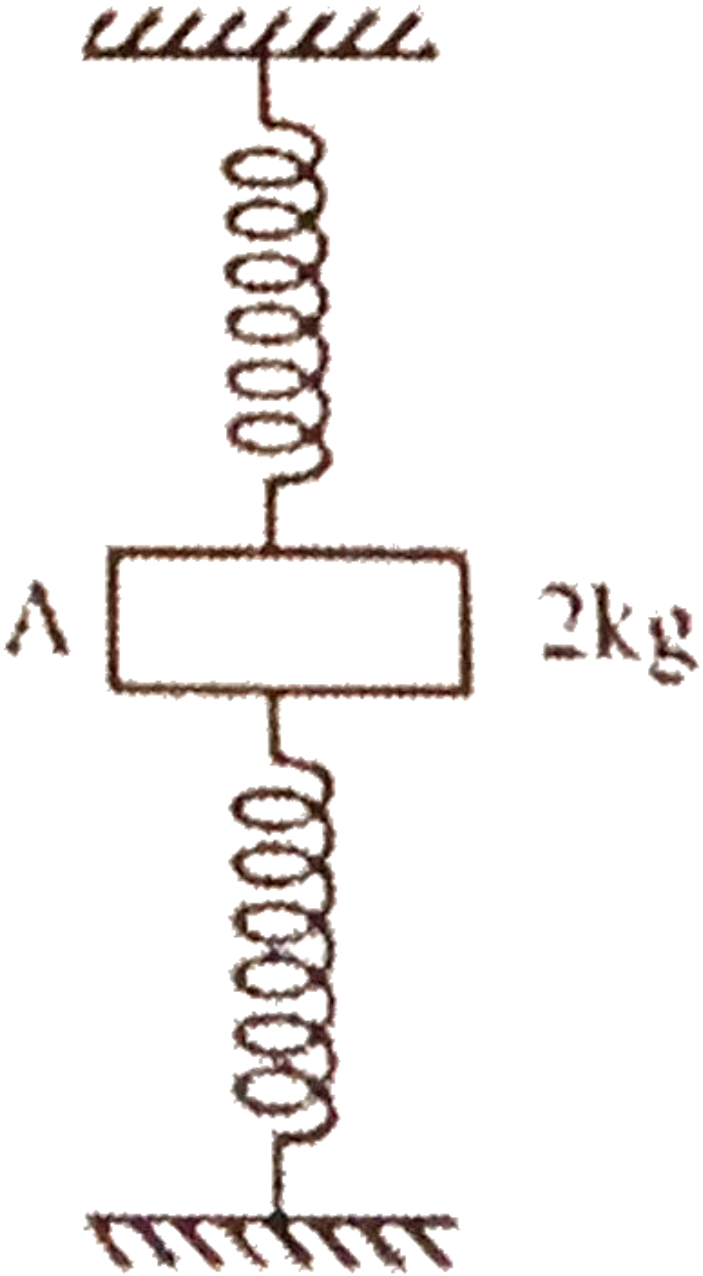
28. A block A of mass 2 kg is connected with two springs, as shown . The spring constant of lower spring is system is thrice the spring costant of upper spring. The system is released from rest with both the springs unstreched. The maximum displacement of bloack is $0.1m$. Find the acceleration of the

block is its lowest position-



A. $6.5m/s^2$

B. $7.5m/s^2$

C. $10m/s^2$

D. $8m/s^2$

Answer: C

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29. In perfectly inelastic collision the relative velocity of the bodies

A. before impact is zero

B. before impact is equal to that after impact

C. after impact is zero

D. None of these

Answer: C

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Part B Chemistry

1. Which of the following does not produce any gaseous product when reacts with water ?

A. Ca_3N_2

B. CaC_2

C. CaO

D. Ca_3P_2

Answer: C

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2. A mixture of salt reach with conc. H_2SO_4 to give Reddish-Brown coloured gas. Which Pass in water then water become coloured then the radical jis -

A. Nitrate

B. Bromide

C. Acetate

D. None of these

Answer: B

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3. The relative rates of effusion of O_2 to CH_4 through a containe containing O_2 and CH_4 in $3:2$ mass ratio will be-

A. $\frac{3\sqrt{2}}{4}$

B. $\frac{3}{4\sqrt{2}}$

C. $\frac{3}{2\sqrt{2}}$

D. None of these

Answer: B

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4. The standard EMF for the given cell reaction $Zn + Cu^{2+} \rightarrow Cu + Zn^{2+}$ is $1.10V$ at $25^\circ C$. The EMF for the cell reaction, when $0.1MCu^{2+}$ and $0.1MZn^{2+}$ solutions are used, at $25^\circ C$ is -

A. $1.10V$

B. $0.110V$

C. $-1.10V$

D. $-0.110V$

Answer: A

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5. The percentage of an element M is 53 in its oxide of molecular formula M_2O_3. Its atomic mass is about -

A. 45

B. 9

C. 18

D. 27

Answer: D

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6. What type of crystal defect is indicated in the diagram given below :

$$\begin{array}{cccccc} Na^+ & Cl^- & Na^+ & Cl^- & Na^+ & Cl^- \\ Cl^- & \square & Cl^- & Na^+ & \square & Cl^- \\ Na^+ & Cl^- & \square & Cl^- & Na^+ & Cl^- \\ Cl^- & Na^+ & Cl^- & Na^+ & \square & N^+ \end{array}$$

A. Frenkel and Schottky defects

B. Schottky defect

C. Interstitial defect

D. Frenkel defect

Answer: B

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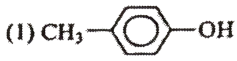
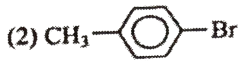
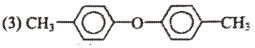
7. The final product obtained in the reaction

A. 

B. 

C. 

D. None of these

Answer: A

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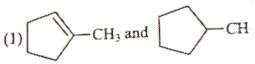
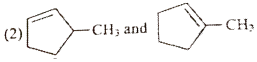
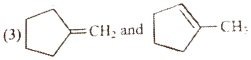
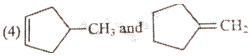
8. Two alkenes, $X(91\,\%$ yield) and $Y(9\,\%$ yield) are formed when the following compound is heated

The structure of X and Y, respectively are -

A. 

B. 

C. 

D. 

Answer: C

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9. Which one of the following platinum complex is used in cancer chemotherapy ?

A. $Cis - \left[PtCl_2(NH_3)_2\right]$

B. trans-$\left[PtCl_2(NH_3)_2\right]$

C. $\left[Pt(NH_3)_4\right]$

D. $\left[PtCl_4\right]^{-2}$

Answer: A

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10. Complex compound $\left[Cr(NCS)(NH_3)_5\right]\left[ZnCl_4\right]$ will be -

A. diamaganetic and shows linkage isomerism

B. colourless and diamagnetic

C. green coloured and diamagnetic

D. green coloured and shows co-ordination isomerism.

Answer: D

View Text Solution

11. $$MnO_2 + KOH + O_2 \rightarrow \underset{(\text{green})}{A} + H_2O$$
$$A + Cl_2 \rightarrow \underset{(\text{purple})}{B} + KCl$$

Select correct statement:-

A. compound B is cloured due to change transfer and it is paramagnetic in nature.

B. Compound B is $KMnO_4$. Tjere is no unparied e^- in Mn

C. Compound A is K_2MnO_4, K_2MnO_4 has tetrahedral shape.

D. $KMnO_4$ acts as oxidising agent. In acidic medium it form Mn^{+2}

Answer: A

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12. Incorrect order of boiling point is -

A. $HF > HI > HBr > HCl$

B. $H_2O > H_2Te > H_2Se > H_2S$

C. $Br_2 > Cl_2 > F_2$

D. $CH_4 > GeH_4 > SiH_4$

Answer: D

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13. The electron affinity of the following element can be arranged -

A. $Cl > O > N > C$

B. $Cl > O > C > N$

C. $Cl > N > C > O$

D. $Cl > C > O > N$

Answer: B

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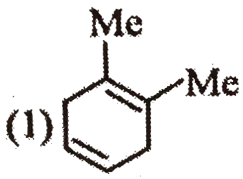
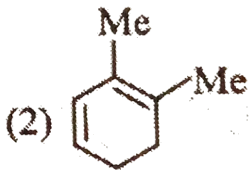
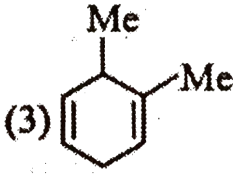
14.

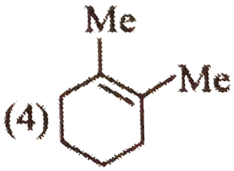
(A) would be -

A.



B. 

C. 

D. 

Answer: B

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15. Which of the following statement are incorrect about phenol-formaldehyde resin ?

A. Novolac or resol is a linear polymer and is used in the manufacture of adhesive

B. Bakelite is a cross-linked polymer and is used in making switches and plugs

C. Novalac is perpared when (P/F) (phenol/formaldehyde) ratio if greater

than 1, wheares bakehte is perpared when (P/F) ratio is less than 1

D. Novolac is prepared when $P/F < 1$, and bakelite is prepared when $P/F > 1$

Answer: D

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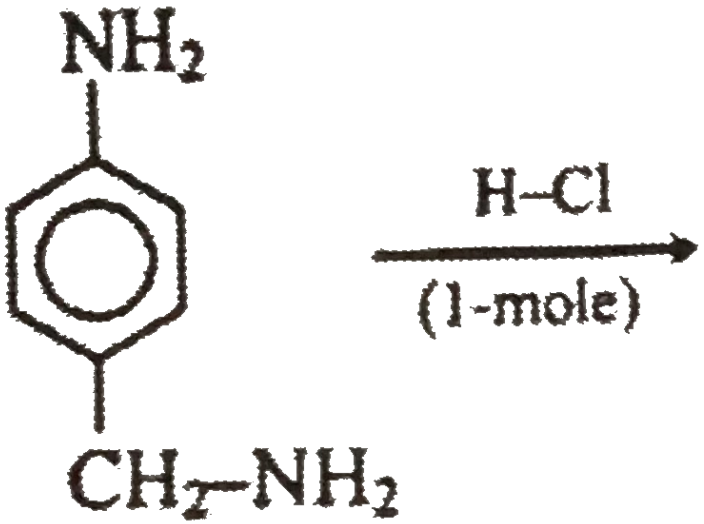
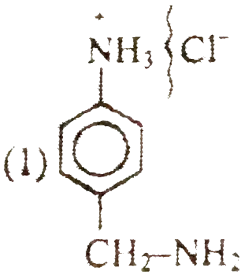
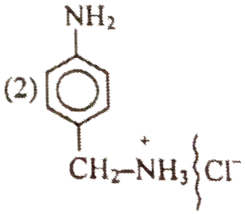
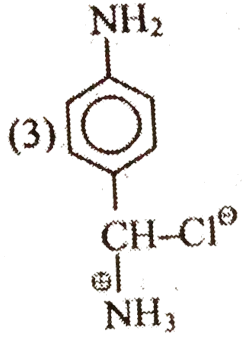
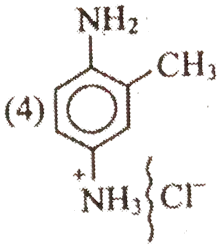
16. 

Product formed in above reaction is -

A. 

B. 

C. 

D. 

Answer: B

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17. Which of the following statement is not true for detergants ?

A. Sodium lauryl-sulphate is anionic detergent

B. Cetyl-trimethyl ammonium bromide is cationic detergent

C. Poly ethylene glycol stearate is nenionic detergent

D. None of these

Answer: D

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18. The incorrect structure of glucine at given pH are-

A. $H_2\overset{\oplus}{N}CH_2 - \underset{\underset{O}{||}}{C} - OH$ at $pH = 2.0$

B. $H_2\overset{\oplus}{N}CH_2 - \underset{\underset{O}{||}}{C} - O^{\ominus}$ at $pH = 6.0$

C. $H_2NCH_2 - \underset{\underset{O}{||}}{C} - O^{\ominus}$ at $pH = 9$

D. $H_2NCH_2 - \underset{\underset{O}{||}}{C} - OH$ at $pH = 12$

Answer: D

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19. Which of the following sets of quantum numberrs discribes the elecron which is removed most easily from a potassium atom in its ground state ?

A. $n = 3, l = 1, m_l = 1, m_s = -\frac{1}{2}$

B. $n = 2, l = 1, m_l = 0, m_s = -\frac{1}{2}$

C. $n = 4, l = 0, m_l = 1, m_s = +\frac{1}{2}$

D. $n = 4, l = 0, m_l = 0, m_s = +\frac{1}{2}$

Answer: D

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20. An aqueous solution of ethanol has density $1.025\frac{g}{m}L$ and it is 2 M. What is the molality of this solution ?

A. 1.79

B. 2.143

C. 1.951

D. None of these

Answer: B

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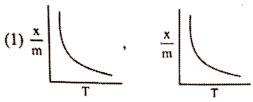
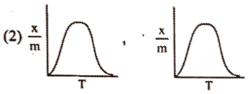
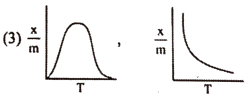
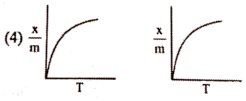
21. Select correct adsorption isobars for chemisorption and physisorption respectively : (where $\frac{x}{m}$ = extent of adorption, T = temperature)

A. 

B. 

C. 

D. 

Answer: C

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22. Which of the following is involved in the extraction of Ag from argentite ?

A. $\left[Ag(NH_3)_2\right]^+$

B. $\left[Ag(SCN)_4\right]^{3+}$

C. $\left[Ag(CN)_2\right]^-$

D. $\left[AgCl_2\right]^-$

Answer: C

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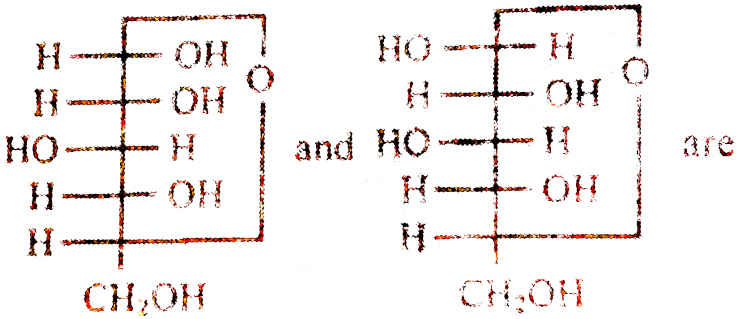
23. 

A. Diastereomers

B. Enantiomers

C. Tautomers

D. Conformers

Answer: A

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24. In which of the following 2^{nd} anion is more stable than first ?

A. $O_2N - \overset{\ominus}{C}H_2$ and $F - CH_2$

B. $\overset{\ominus}{C}F_3$ and $\overset{\ominus}{C}Cl_3$

C. $F_3C - \overset{\ominus}{C}H_2$ and $Cl_3C - \overset{\ominus}{C}H_2$

D. $CH_3 - \overset{O}{\overset{||}{C}} - \overset{\ominus}{C}H_2$ and $H_2N - \overset{\ominus}{C}H_2$

Answer: B

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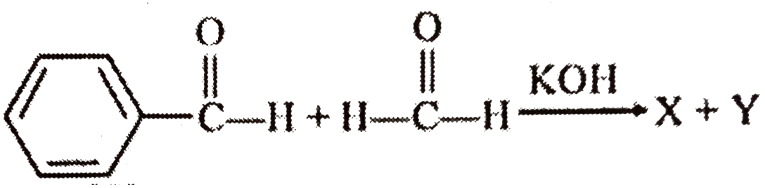
25. Find out the product of following reaction :



X and Y are :

A. $Ph - \overset{O}{\overset{||}{C}} - \overset{\ominus}{O}$ and CH_3OH

B. $Ph - CH_2OH$ and $H - \overset{\overset{O}{||}}{C} - \overset{\ominus}{O}$

C. $P - CH_2OH$ and CH_3OH

D. $Ph - \overset{\overset{O}{||}}{C} - \overset{\ominus}{O}$ and $H - \overset{\overset{O}{||}}{C} - \overset{\ominus}{O}$

Answer: B

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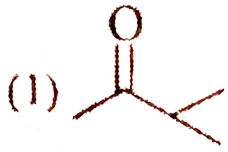
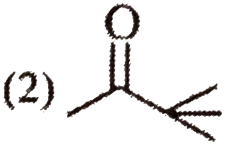
26. $CH_3 - \underset{\underset{OH}{|}}{\overset{\overset{CH_3}{|}}{C}} - \underset{\underset{NH_2}{|}}{\overset{\overset{CH_3}{|}}{C}} - CH_3 \xrightarrow[\Delta]{HNO_2} ?$

A. 

B. 

C. 

D. 

Answer: B

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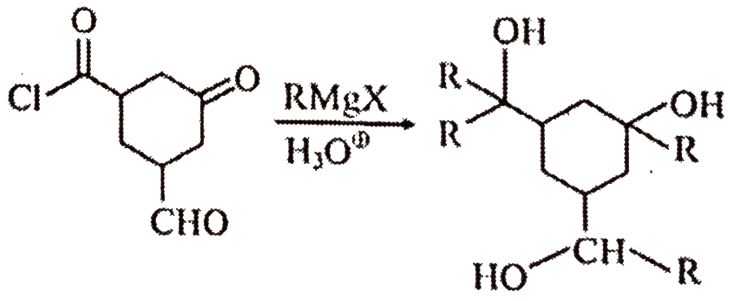
27.



How many molecules of $RMgX$ are consumed in the above given reaction ?

A. 2

B. 4

C. 5

D. 6

Answer: B

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28. In a hydrogen atom, the transition takes place from $n = 3$ to $n = 2$. If Rydberg constant is $1.097 \times 10^7 m^{-10}$. The wavelength of the emiited radiation is

A. $\frac{36}{5R_H}$

B. $\frac{5R_H}{36}$

C. $\frac{3}{4R_H}$

D. $\frac{4}{3R_H}$

Answer: A

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29. If $30g$ of a solute of molecular weight 154 is dissolved in $250g$ of benzene. What will be the elevation in boiling point -

(Given : $K_{b(C_eH_6)} = 2.6KKgmol^{-1}$)

A. 3.05

B. 2.05

C. 4.05

D. 10

Answer: B

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30. If $50\,\%$ of CO_2 converts to CO at the following equilibrium :

$$\frac{1}{2}C(s) + \frac{1}{2}CO_2(g) \Leftrightarrow CO(g)$$

and the equilibrium pressure is 12 atm Calculate K_P.

A. 4

B. 7.5

C. 1

D. 14

Answer: A

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