doubtnut
India's Number 1 Education App

PHYSICS

BOOKS - CAREER POINT

MOCK TEST 9

Physics

1. The equation of a wave is given by $Y = 5\sin 10\pi(t - 0.01x)$ along the x-axis. (All the quantities are expressed in SI units). The phase difference between the points separated by a distance of $10m$ along x-axis is

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

B. π

C. 2π

D. $\frac{\pi}{4}$

Answer: 2

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2. Two tuning forks with natural frequencies of $340Hz$ each move relative to a stationary observer. One fork moves away form the observer, while the other moves towards him at the same speed. The observer hears beats of frequency $3Hz$. Find the speed of the tuning fork.

A. $1m/s$

B. $1.5m/s$

C. $340m/s$

D. $2.5m/s$

Answer: 2

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3. Main scale of a screw gauge is 3mm and 42 division of circular scale of 100 divisions coincides with reference line then find the diameter of the cylinder

A. 1.42 cm

B. 2.42 cm

C. 1.21 m

D. 3.42 mm

Answer: 4

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4. Two spheres of different materials one with double the radius and one-fourth wall thickness of the other are filled with ice. If the time taken for complete melting of ice in the larger sphere is 25 minutes and for smaller one is 16 minutes, the ratio of thermal conductivities of the materials of larger sphere to that of smaller sphere is:

A. $4:5$

B. $5:4$

C. $25:8$

D. $8:25$

Answer: 4

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5. A car battery of emf 12V and internal resistance 0.05ω receives a current of 60 A from an external source, then the terminal potential difference of the battery is

A. 32 V

B. 10V

C. 15V

D. 9V

Answer: 3

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6. The field normal to the plane of a wire of n turns and radis r which carriers i is measured on the axis of the coil at a small distance h from the centre of the coil. This is smaller than the field at the centre by the fraction.

A. $\frac{3}{2}\frac{h^2}{r^2}$

B. $\frac{2}{3}\frac{h^2}{r^2}$

C. $\frac{3}{2}\frac{r^2}{h^2}$

D. $\frac{2}{3}\frac{r^2}{h^2}$

Answer: 1

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7. A short magnet produces a dfection of 30° when placed at certain distance in tanA position of magnetometer. If another short magnet of double the length and thrice the pole strength is placed at the same distance in tabB position of the magnetometer, the deflection produced will be

A. 60°

B. 30°

C. 45°

D. None of these

Answer: 1

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8. A block of mass m compresses a spring iof stifffness k through a distacne $l/2$ as shown in the figure .If the block is not fixed to the spring

the period of motion of the block is

A. $2\pi\sqrt{\frac{m}{k}}$

B. $(\pi+4)\sqrt{\frac{m}{k}}$

C. $(1+\pi)\sqrt{\frac{m}{k}}$

D. None of these

Answer: 2

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9. A highly rigid cubical block A of small mass M and side L is fixed rigidly on the other cubical block of same dimensions and of modulus of rigidity η such that the lower face of A completely covers the upper face

of B. The lower face of B is rigidly held on a horizontal surface . A small force F is applied perpendicular to one of the side faces of A. After the force is withdrawn , block A executes faces of A. After the force is withdrawn , block A exceutes small oscillations , the time period of which is given by

A. $2\pi\sqrt{M\eta L}$

B. $2\pi\dfrac{\sqrt{M\eta}}{L}$

C. $2\pi\dfrac{\sqrt{ML}}{\eta}$

D. $2\pi\dfrac{\sqrt{M}}{\eta L}$

Answer: 4

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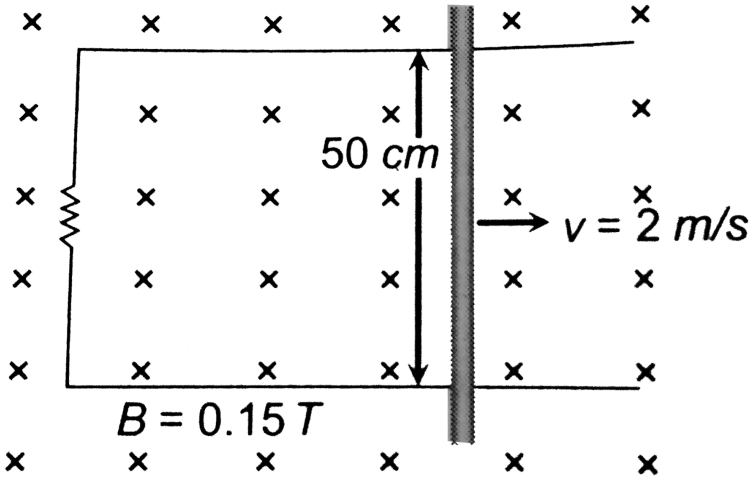
10. As shown in the figure a metal rod makes contact and complete the circuit. The circuite is perpendicular to the magnetic field with $B = 0.15$ tesla. If the resistance is 3Ω force needed to move the rod as indicated

with a constant speed of $2m/\sec$ is



A. 3.75×10^{-3N}

B. 3.75×10^{-2N}

C. 3.75×10^{2N}

D. 3.75×10^{-4N}

Answer: 1

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11. For an electric dipole potential & electric field

A. can have same magnitude for a point at a distance less than 2 meter

B. can have same magnitude fo a point at distacnes greater than 2 meter

C. can never be equal

D. can never be predicted

Answer: 2

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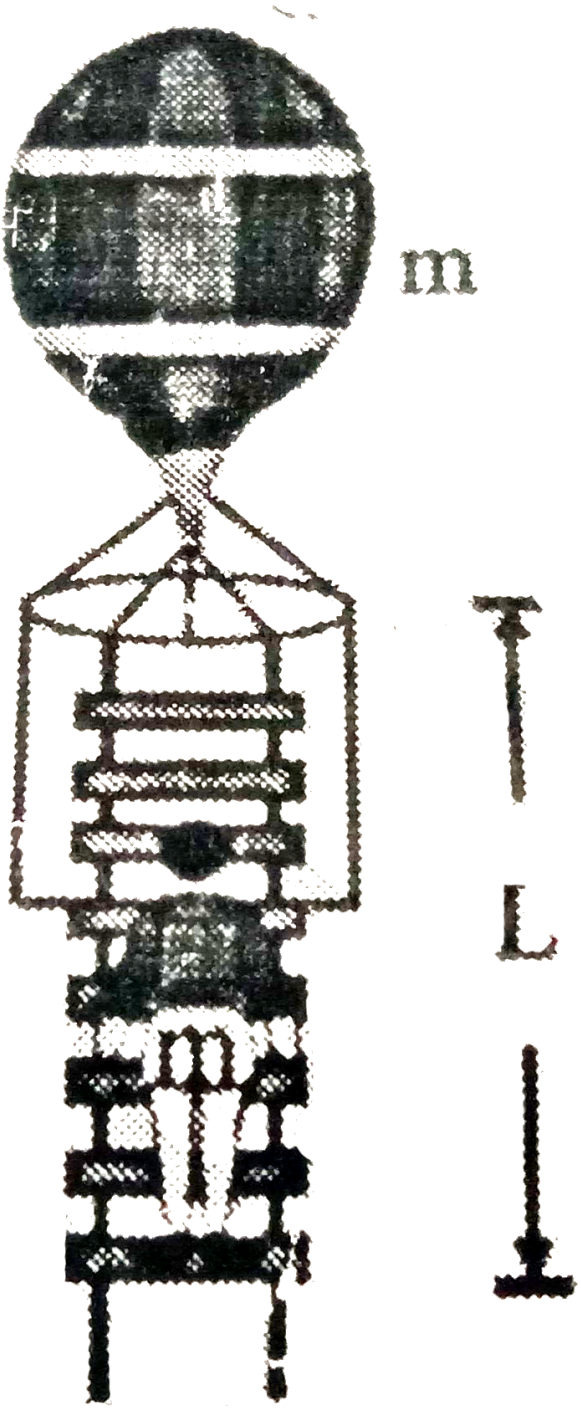
12. A rope ladder of length L is attached to ballon of mass m. As the man of mass m clims the ladder in to the lballon basket the ballon comes donws by a vertical distance s. Then increase in potential energy of man

divided by increase inn potential energy of ballon is



A. $\frac{L-s}{s}$

B. $\frac{L}{s}$

C. $\frac{s}{L-s}$

D. $L-s$

Answer: 1

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13. A scylindrical rod of mass M, length L & radius R has cords wound around it , whose ends are attached to the ceioling .The rod is held borizontal and released .The liinear acceleration of the cylinder as it falls and tension in the cords is

A. $g, Mg/2$

B. $g/3, Mg/3$

C. $2g/3, Mg/6$

D. $g/2, Mg/12$

Answer: 3

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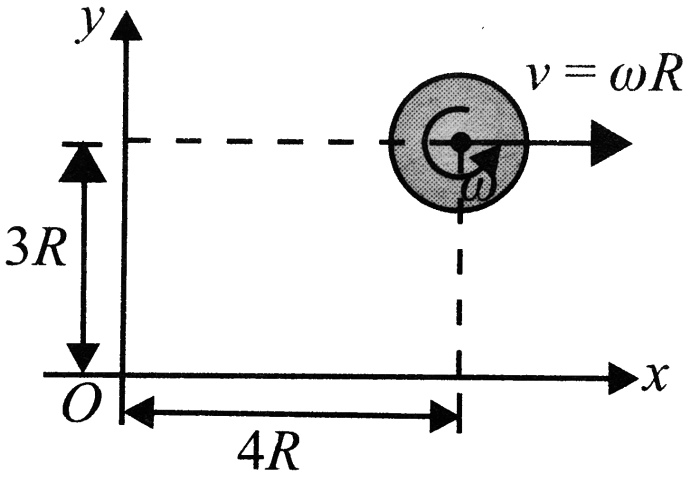
14. A disc of mass m and radius R moves in the $x-y$ plane as shown in Fig. The angular momentum of the disc about the origin O at the instant shown is



A. $\frac{5}{2}mR^2\omega$

B. $\frac{7}{3}mR^2\omega$

C. $\frac{9}{2}mR^2\omega$

D. $\frac{3}{2}mR^2\omega$

Answer: 1

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15. N molecules each of mass m of gas A and 2 N molecules each of mass 2m of gas B are contained in the same vessel which is maintined at a temperature T. The mean square of the velocity of the molecules of B type is denoted by v^2 and the mean square of the x-component of the velocity of a tye is denoted by ω^2. What is the ratio of $\omega^2/v^2 = ?$

A. 2

B. 1

C. $(1/3)$

D. $(2/3)$

Answer: 4

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16. "Two metallic spheres"

S_1&

S_2area made of same material /The mass ofS_1Is thrice that ofS_2Both of th

A. $\frac{1}{3}$

B. $\frac{1}{\sqrt{3}}$

C. $\frac{1}{(3)^{1/3}}$

D. $\frac{1}{\sqrt{3}^{2/3}}$

Answer: 3

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17. If the nucleus were the size of the basket ball, what would the diameter of the atom be?

(Given diameter of basket ball = 24 cm)

A. 24 km

B. 12 km

C. 10 km

D. 15 km

Answer: 1

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18. One gram of radium is reduced by 2 miligram in 5 yers by α-decay. Calculate the half-life of radium.

A. 1700 yr

B. 1000 yr

C. 1115 yr

D. 979 yr

Answer: 1

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19. When photons of energy hv fall on an aluminium plate (of work function E_0), photoelectrons of maximum kinetic energy K are ejected . If the frequency of the radiation is doubled , the maximum kinetic energy of the ejected photoelectrons will be

A. K+hv

B. $K + \varepsilon_0$

C. 2K

D. K

Answer: 1

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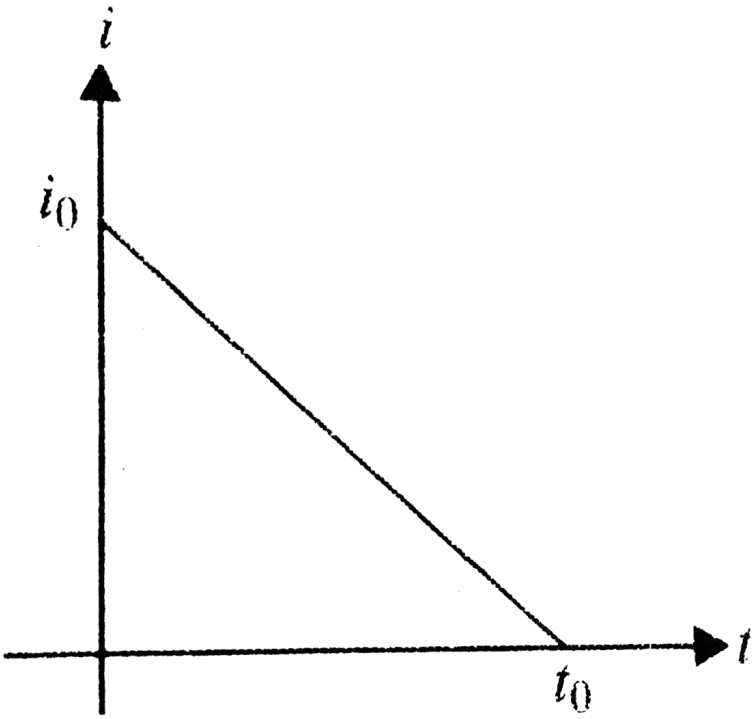
20. Relation between current in a conductor and time is shown in fig.



Write the expression of current in terms of time.

A. $i = \frac{i_0 t}{t_0}$

B. $i = i_0\left(1 + \frac{t}{t_0}\right)$

C. $i = i_0\left(\frac{t}{t_0} - 1\right)$

D. $i = i_0\left(1 - \frac{t}{t_0}\right)$

Answer: 4

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21. Two charges, each equal to $1\mu C$, are placed at the vertices A and B of a triangle ABC. The produced of AC and BC is $30cm^2$. The sum of the sides AC and BC is $10cm$. The potential at C is

A. $3 \times 10^5 V$

B. $6 \times 10^5 V$

C. $9 \times 10^5 V$

D. $18mV$

Answer: 1

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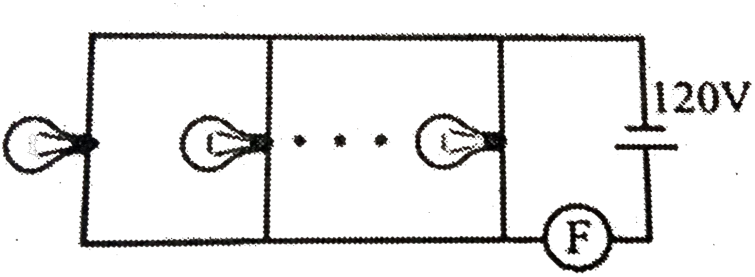
22. Some light bulbs are connected in paralles to 120 V source as shown in the figure .Each bulb dissipates as power of 60 W .The circuit has a fuse F that burns out when the current in the cicuit exceeds 9A .Determine the largest number of bulbs, which can be used in this circuit without burning out the fuse



A. 9

B. 18

C. 25

D. 34

Answer: 2

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23. A balloon starts rising from the ground with an acceleration of $1.25ms^{-2}$. After 8 seconds, a stone is released from the balloon. After releasing, the stone will:

A. cover a distance of 40 m

B. have a displacement of 50 m

C. reach the ground in 4s

D. begin to move down after

Answer: 3

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24. "Mechanical force" $= \frac{a}{B^3 + \text{volumetric density}}$

"Then a and b have dimensions"

A. $\left[MLT^{-2}\right], \left[M^{\frac{1}{2}}L^{-1}\right]$

B. $\left[M^2L^{-2}T^{-2}\right], \left[M^{\frac{1}{3}}L^{-1}\right]$

C. $\left[ML^{-2}T^{-2}\right], \left[M^{\frac{1}{3}}L^{\frac{1}{2}}\right]$

D. $\left[M^2L^{-2}T^{-2}\right], \left[M^3L^{-1}\right]$

Answer: 2

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25. The orbital period of sa satellite near the surface of the planet of radius R is given by (ρ is the density of the planet):

A. $\frac{3\pi}{(\rho G)^{1/2}}$

B. $\frac{4\pi}{(3\rho G)^{1/2}}$

C. $\frac{4\pi}{(\rho G)^{1/2}}$

D. $\frac{3\pi}{(4\rho G)^{1/2}}$

Answer: 1

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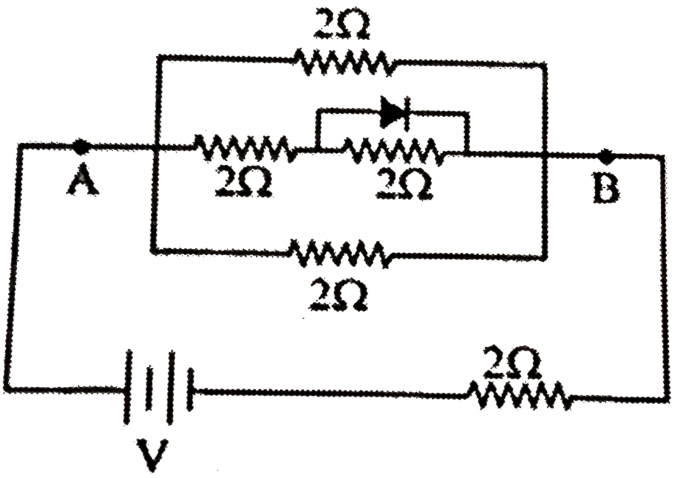
26. In the circuit shown in figure , the diode is ideal The potential difference between A and B is



A. $V/4$

B. V

C. zero

D. $V/2$

Answer: 1

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27. A body o fmass 6 kg moves in a staight line according to the equation x=$t^3 - 75t$, where x denotes the distance in metre and t the time in second. The force on the body at t=4s is

A. 64 N

B. 72 N

C. 144 N

D. 36 N

Answer: 3

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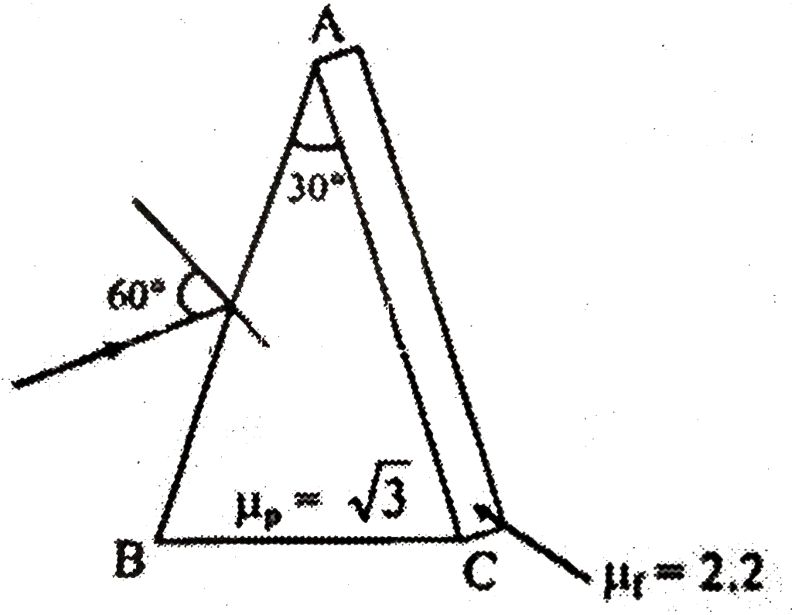
28. Shown in the figure is a prism of angle 30° and refractive index $\mu_p = \sqrt{3}$. Face AC of the prism is covered with a thin film of refractive index $\mu_f = 2.2$ A monochromatic light of wavelength λ =550 nm fall on

the face AB at an angle of incidence of 60° Calculate angle of emergence



A. 0°

B. 30°

C. 45°

D. Not emerge

Answer: 1

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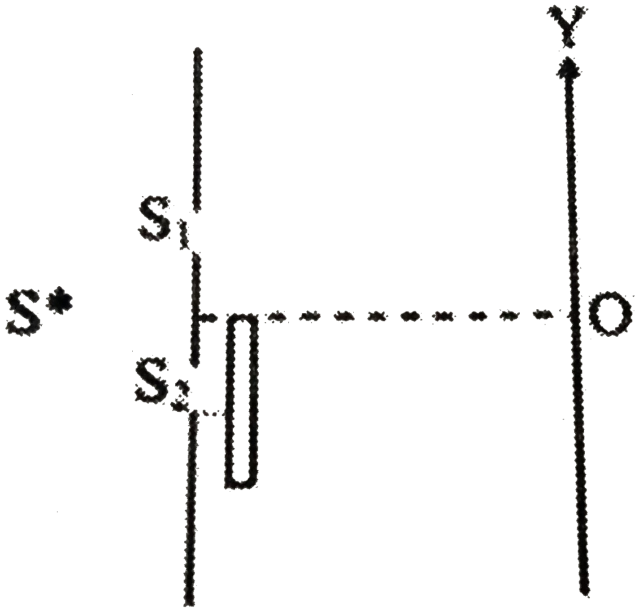
29. The young's slit experiment is done in a medium of refractive index $4/3$ .A light of 600 nm wavelength is falling on the slits having 0.45 mm separation . The lower slit S_2 is covered by a thin galss sheet of thickness 10.4 μm and r3efractive index 1.5 .The interferecnce pattern is observed on a screen placed 1.5 m form the slits as shown in figure .Find the light intensity at point O relative to the maximum fringle intensity

$\left(Given: \cos 3.4 = \sqrt{0.75}\right.$



A. $\frac{1}{4}$

B. $\frac{1}{2}$

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

D. 0

Answer: 3

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30. A polariser is place in a pth of unpolarised light of intensity I_0 An another polariser is placed in such a way that its axis makes an angle 30° with first. Opne The intensity of emergent light will be

A. 0

B. $\frac{I_0}{4}$

C. $\frac{3I_0}{4}$

D. $\frac{3I_0}{8}$

Answer: 4

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Chemistry

1. If uncertainty in position and momentum are equal then uncertainty in velocity is.

A. $\sqrt{\frac{h}{\pi}}$

B. $\frac{h}{2\pi}$

C. $\frac{1}{2m}\sqrt{\frac{h}{\pi}}$

D. None of these

Answer: 3

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2. Hydrolysis of one mole of peroxodisulphuric acid produces

A. two moles of sulphuric acid

B. two moles of peroxymonosuphuric acid

C. one mole of suphuric acid and one mole of peroxymonosulhuric acid

D. one mole of suphuric acid one mole of peroxymonosuphuric acid and one mole of hydrogen peroxide

Answer: 3

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3. Which one of the following is an inner orbital complec as well as diamagnetic in behaviour?

A. $\left[Zn(NH_3)_6\right]^{2+}$

B. $\left[Ni(NH_3)_6\right]^{2+}$

C. $\left[Cr(NH_3)_6\right]^{3+}$

D. $\left[Co(NH_3)_6\right]^{3+}$

Answer: 4

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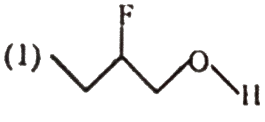
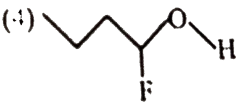
4. In which of the following compound is hydroxylic proton the most acidic?

A. 

B.

C.

D. 

Answer: 4

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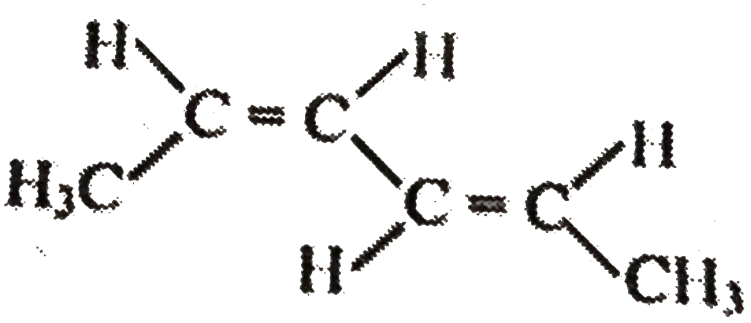
5. The correct name of the structure



A. (E),(E)-2,4-hexadicene

B. (Z),(Z)-2,4-hexadicene

C. (E),(Z)-3,5-hexadicene

D. (Z),(E)-2,4-hexadicene

Answer: 4

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6. The gold numbers of protective colloids A,B,C and D are 0.04, 0.004 , 10 and 40 respectively. The protective powers of A,B,C and D are in the order:

A. $A > B > C > D$

B. $B > A > C > D$

C. $D > C > A > B$

D. $D > C > B > A$

Answer: 2

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7. In a solid, oxide ions are arranged in ccp, cations 'A' occupy one sixth of tertrahedral voids and cations 'B' occupy one third of the octaherdral voids .Which of the following is the correct formula of the oxide?

A. ABO_3

B. A_2BO_3

C. AB_2O_3

D. None

Answer: 1

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8. $\Delta_r U^\circ$ of formation of CH_4 (g) at certain temperature is - 393 kJ mol^{-1} .The value of $\Delta_r H^\circ$ is

A. zero

B. $< \Delta_r U^\circ$

C. $> \Delta_r U^\circ$

D. equal to $\Delta_r U^\circ$

Answer: 2

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9. Which of the following statements is incorrect ? Standard Gibbs free energy change is always zero at equilibrium

A. Addtion of solid does not affect equlibrium

B. Addition of solid does not affect equlibrium

C. On addition of catalyst the value of equilibrium constants is not affected

D. Equilibrium constant for a reaction with negative ΔH value decreases as the temperature increases

Answer: 1

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10. Calculate Osmotic Pressure of a solution obtained on mixing 100 mL of 3.4%

$\left(w\frac{t}{v}ol\right)$ solution of area $(Mol.\ wt60)$ and $50mL$ of $1.6\ \%\ (wt/vol)$ solution of c

A. 9.704

B. 10

C. 12.74

D. 15

Answer: 1

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11. Monomer related to Nylon 26 is

A. Alanine

B. Glycine

C. Adiple acid

D. Hexa methylene diamine

Answer: 2

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12. Arrange in increasing order of solubility of AgBr in solutions given

(i)0.1 M NH_3 (ii)0.1 M $AgNo_3$ (iii)0.2 M NaBr (iv)pure water

A. $(iii) < (ii) < (iv) < (i)$

B. $(iii) < (ii) < (i) < (iv)$

C. $(iii) < (ii) < (i) < (iv)$

D. $(ii) < (iii) < (iv) < (i)$

Answer: 1

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13. Green house gases are-

A. CFC, O_3 and water vapours

B. Peroxy aeetyl niotrate, CFC andO_3

C. NO_2CH_4 and SO_2

D. peroxy acetyl nitrate, NO_2 and SO_2

Answer: 1

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14. In which process maximum energy is released ?

A. $S_g^- + e^- \rightarrow S_g^{-2}$

B. $F_g^- + e^- \rightarrow F_g^-$

C. $N_g^- + e^- \rightarrow N_g^-$

D. $S_g^- + e^- \rightarrow S_g^-$

Answer: 2

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15. $M(g) \rightarrow M_g^+ + e^-, \Delta H1 = 100KJ/mol$

$M(g) \rightarrow M_g^{+2} + 2e^-, \Delta H2 = 300KJ/mol$

$M(g) \rightarrow M_g^{+3} + 3e^-, \Delta H3 = 650KJ/mol$

Select incorrect sattlement:

A. $IE_3 of Mis 350KJ/mol$

B. $IE_2 of Mis 200KJ/mol$

C. $IE_2 of M^+ is 300KJ/mol$

D. $IE_2 of M^+ is 350KJ/mol$

Answer: 3

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16. Which of the following in non linear

A. I_3

B. XeF_2

C. I_3

D. CO_2

Answer: 3

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17. The quantity $\left[P\frac{V}{k}T\right]$ represent

A. mass of the gas

B. K.E of the gas

C. number of moles of the gas

D. number of molecules of the gas

Answer: 4

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18. When the concentration of alkyl halide is triple and concentration of OH reduced to half , the rate of S_n rectio increased by :

A. 3 times

B. 1.5 times

C. 2 times

D. 6 times

Answer: 2

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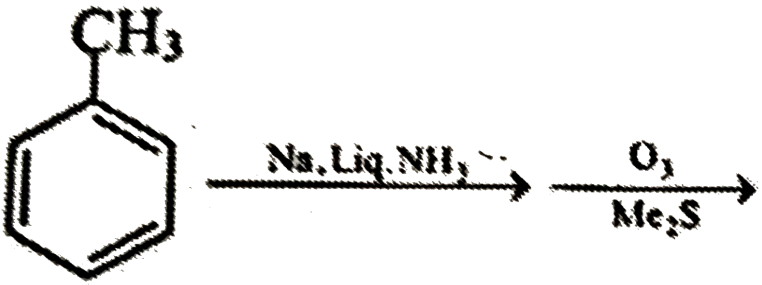
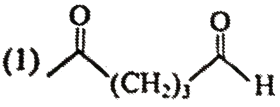
19.



Product:

A.



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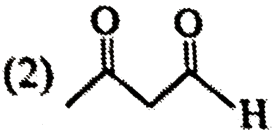
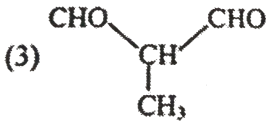


C. 

D.

Answer: 2

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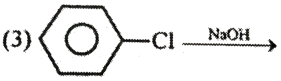
20. Which of the following reaction is possible ?

A. $CH_3 - Br \xrightarrow{OH}$

B. $CH_3 - OHr \xrightarrow{Br}$

C. 

D. $HC = Ch \xrightarrow{NaOH}$

Answer: 1

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21. In the unbalanced reaction,

$CrO_5 + SnCI_2 \rightarrow CrO_4^{2-} + SnCI_4$, the element undergoiing oxidation and reduction respectively are:

A. $CrSn$

B. Sn, Cr

C. Sn, O

D. CI, C

Answer: 3

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22. If $Ca_3(PO_4)_2$ and H_3PO_3 contain same number of 'P' atom then the ratio of oxygen atoms in these compounds respectively is :

A. $8/3$

B. $2/3$

C. 3

D. $4/3$

Answer: 4

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23. $FeCI_3$+ "Pot . This o cyanate rarr product colour of above product is"

A. Red

B. Chocolate colour

C. Prussian blue

D. Colorless

Answer: 1

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24. "Equivalent conducatance of 0.1 M HA (Weak acid) soution is 10" Scm^2 "equivalent (-1) Hence pH of HA solution is"

A. 1.3

B. 1.7

C. 2.3

D. 3.7

Answer: 3

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25. Which of the following is known as Hinsberg reagent ?

A. $COOH - COOH$

B. $COCICOCI$

C. $C_6H_5 - SO_2 - CI$

D. $C_6H_5 - CO - CI$

Answer: 3

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26. A salt is formed when a weak acid of dissociation constant 10^{-4} and weak base of dissociation constant 10^{-5} are mixed. The pH and degree of hydrolysis of salt solution are

A. 5,1%

B. 7,12%

C. 6.5,0.3%

D. 0.3,6.5 %

Answer: 3

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27. Aspirin is an acetylation product of

A. p-dihydroxy benzene

B. m-hydroxy benzene and salicylic acid both

C. o-di hydroxy benzene and salicylic acid both

D. o-hydroxy benzoic acid

Answer: 4

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28. Phenol and benzoic acid is separated by :

A. $NaHCO_3$

B. NaOH

C. Na

D. $NaNH_2$

Answer: 1

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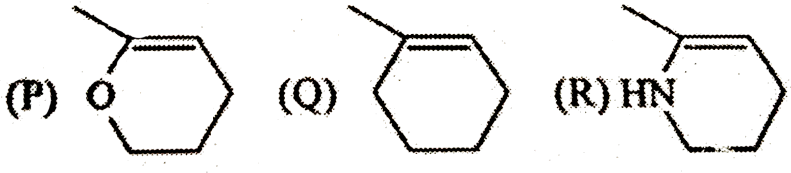
29. Rank the following in the increasing oprder of rate of reaction with HBr



A. $R > P > Q$

B. $R > Q > P$

C. $P > R > s$

D. $P > S > R$

Answer: 1

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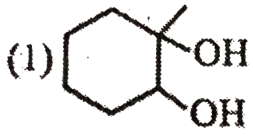
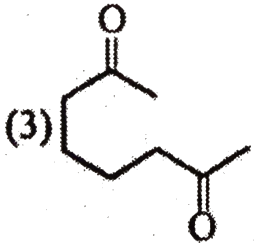
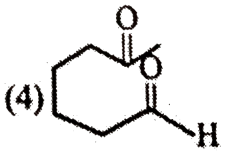
30.

A. 

B.

C. 

D. 

Answer: 4

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