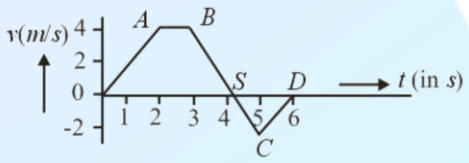
Q1. The quantities $x = \frac{1}{\sqrt{\mu_0 \epsilon_0}}, y = \frac{E}{B}$ and $z = \frac{l}{CR}$ are defined where C-capacitance, R-Resistance, $\ell -$ length, EElectric field, B-magnetic field and $\in 0, \mu 0$, -free space permittivity and permeability respectively. Then:
(1) x, y and z have the same dimension.
(2) Only x and z have the same dimension
(3) Only x and y have the same dimension
(4) Only y and z have the same dimension.

Q2. The velocity (v) and time (t) graph of a body in a straight line motion is shown in the figure. The point S is at 4. 333 seconds. The total distance covered by the body in 6 s is :



(1) $\frac{37}{3}$ m
(2) 12 m
(3) 11 m
(4) $\frac{49}{4}$ m

Q3. A spaceship in space sweeps stationary interplanetary dust. As a result, its mass increases at a rate $\frac{dM(t)}{dt} = bv^2(t)$, where $v(t)$ is its instantaneous velocity. The instantaneous acceleration of the satellite is:
(1) $-bv^3(t)$
(2) $\frac{-bv^3}{M(t)}$
(3) $-\frac{2bv^3}{M(t)}$
(4) $-\frac{bv^3}{2M(t)}$

Q4. The acceleration due to gravity on the earth's surface at the poles is g and angular velocity of the earth about the axis passing through the pole is ω. An object is weighed at the equator and at a height h above the poles by using a spring balance. If the weights are found to be same, then h is: ($h \ll R$, where R is the radius of the earth)
(1) $\frac{R^2\omega^2}{2g}$
(2) $\frac{R^2\omega^2}{g}$
(3) $\frac{R^2\omega^2}{4g}$
(4) $\frac{R^2\omega^2}{8g}$

Q5. In an experiment to verify Stokes law, a small spherical ball of radius r and density ρ falls under gravity through a distance h in air before entering a tank of water. If the terminal velocity of the ball inside water is same as its velocity just before entering the water surface, then the value of h is proportional to: (ignore viscosity of air)
(1) r^4
(2) r
(3) r^3
(4) r^2

Q6. Two different wires having lengths L_1 and L_2 and respective temperature coefficient of linear expansion α_1 and α_2, are joined end-to-end. Then the effective temperature coefficient of linear expansion is :
(1) $\frac{\alpha_1 L_1 + \alpha_2 L_2}{L_1 + L_2}$
(2) $2\sqrt{\alpha_1 \alpha_2}$
(3) $\frac{\alpha_1 + \alpha_2}{2}$
(4) $4\frac{\alpha_1 \alpha_2}{\alpha_1 + \alpha_2}\frac{L_2 L_1}{(L_2 + L_1)^2}$

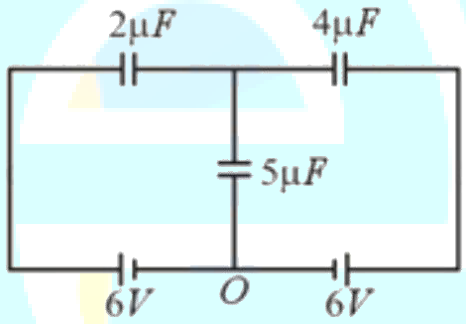
Q7. In an adiabatic process, the density of a diatomic gas becomes $32n$ times its initial value. The final pressure of the gas is found to be n times the initial pressure. The value of n is:
(1) 32
(2) 326
(3) 128
(4) $\frac{1}{32}$

Q8. A ring is hung on a nail. It can oscillate, without slipping or sliding (i) in its plane with a time period T_1 and (ii) back and forth in a direction perpendicular to its plane, with a period T_2. The ratio $\frac{T_1}{T_2}$ will be :
(1) $\frac{2}{\sqrt{3}}$
(2) $\frac{2}{3}$
(3) $\frac{3}{\sqrt{2}}$
(4) $\frac{\sqrt{2}}{3}$

Q9. A driver in a car, approaching a vertical wall notices that the frequency of his car horn has changed from 440 Hz to 480 Hz , when it gets reflected from the wall. If the speed of sound in air is 345 m s^{-1}, then the speed of the car is:
(1) 54 km/hr
(2) 36 km/hr
(3) 18 km/hr
(4) 24 km/hr

Q10. Ten charges are placed on the circumference of a circle of radius R with constant angular separation between successive charges. Alternate charges 1,3,5,7,9 have charge $(+q)$ each, while 2,4,6,8,10 have charge $(-q)$ each. The potential V and the electric field E at the centre of the circle are respectively : (TakeV $= 0$ at infinity)
(1) $V = \frac{10q}{4\pi\epsilon_0 R}; E = 0$
(2) $\mathrm{V} = 0, \mathrm{E} = \frac{10\mathrm{q}}{4\pi\epsilon_0 \mathrm{R}^2}$
(3) $V = 0; E = 0$
(4) $V = \frac{10q}{4\pi\epsilon_0 R}; E = \frac{10q}{4\pi\epsilon_0 R^2}$

Q11. In the circuit shown, charge on the 5μ F capacitor is :

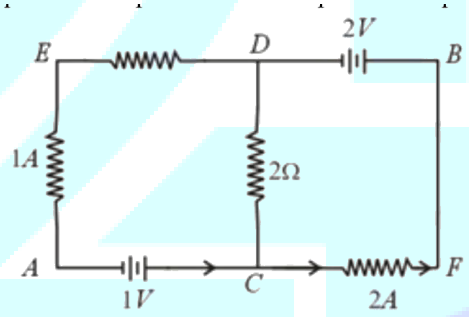


(1) 18.00μC
(2) 10.90μC
(3) 16.36μC
(4) 5.45μC

Q12. A parallel plate capacitor has plate of length l, width w and separation of plates is d. It is connected to a battery of emf V. A dielectric slab of the same thickness d and of dielectric constant $K = 4$ is being inserted between the plates of the capacitor. At what length of the slab inside plates, will the energy stored in the capacitor be two times the initial energy stored?
(1) $\frac{2l}{3}$
(2) $\frac{l}{3}$
(3) $\frac{l}{4}$
(4) $\frac{l}{2}$

Q13. A galvanometer is used in laboratory for detecting the null point in electrical experiments. If, on passing a current of $6mA$ it produces a deflection of 2°, its figure of merit is close to :
(1) $333°A/div$
(2) 6×10^{-3} A/div
(3) 666°A/div.
(4) 3×10^{-3} A/ div

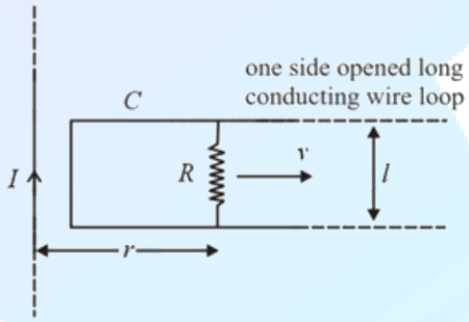
Q14. In the circuit, given in the figure currents in different branches and value of one resistor are shown. Then potential at point B with respect to the point A is:



(1) $+2V$
(2) $-2V$
(3) $-1V$
(4) $+1V$

Q15. An iron rod of volume 10^{-3} m^3 and relative permeability 1000 is placed as core in a solenoid with 10 turns cm^{-1}. If a current of 0.5 A is passed through the solenoid, then the magnetic moment of the rod will be :
(1) $50 \times 10^2 Am^2$
(2) $5 \times 10^2 Am^2$
(3) $500 \times 10^2 Am^2$
(4) $0.5 \times 10^2 Am^2$

Q16. An infinitely long straight wire carrying current I , one side opened rectangular loop and a conductor C with a sliding connector are located in the same plane, as shown in the figure. The connector has length 1 . and resistance R. It slides to the right with a velocity v. The resistance of the conductor and the self inductance of the loop are negligible. The induced current in the loop, as a function of separation r, between the connector and the straight wire is



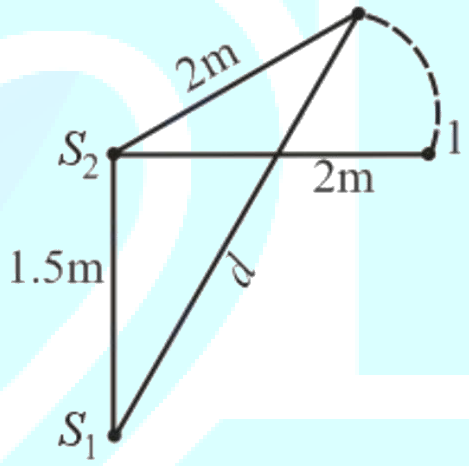
(1) $\frac{\mu_0}{4\pi}\frac{\mathrm{Iv}\ell}{\mathrm{Rr}}$
(2) $\frac{\mu_0}{\pi}\frac{\mathrm{Iv}\ell}{\mathrm{Rr}}$
(3) $\frac{2\mu_0}{\pi}\frac{\mathrm{Iv}\ell}{\mathrm{Rr}}$
(4) $\frac{\mu_0}{2\pi}\frac{\mathrm{Iv}\ell}{\mathrm{Rr}}$

Q17. The correct match between the entries in column I and column II are :

	I		II
	Radiation		
a	Wicrowave	i	100 m
a	Mathength		
b	Gamma rays	ii	10^{-15} m
c	A.M. radio	iii	10^{-10} m

d X-rays
iv 10^{-3} m
(1) (a)-(ii), (b) - (i), (c) - (iv), (d) - (iii)
(3) (iii), (b) (ii), (c) - (i), (d) - (iv)
(2) (a)-(i), (b) - (iii), (c) - (iv), (d) - (ii)
(3) (a)-(iii), (b) - (ii), (c) - (i), (d) - (iv)
(4) (a)-(iv), (b) - (ii), (c) - (i), (d) - (iii)

Q18. Two coherent sources of sound, S_1 and S_2, produce sound waves of the same wavelength $\lambda = 1$ m are in phase. S_1 and S_2 are placed 1.5 m apart (see fig). A listener, located at L, directly in front of S_2, finds that the intensity is at a minimum when he is 2 m away from S_2. The listener moves away from S_1, keeping the distance from S_2 fixed. The adjacent maximum of intensity is observed when the listener is at a distance d from S_1. Then d is :



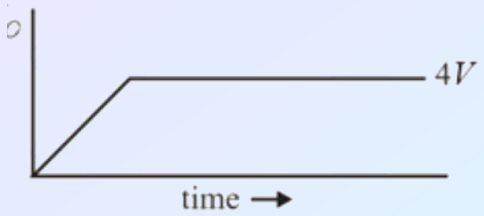
(1) 12 m
(2) 5 m
(3) 2 m
(4) 3 m

Q19. A radioactive nucleus decays by two different processes. The half-life for the first process is 10 s and that for the second is 100 s . The effective half-life of the nucleus is close to:
(1) 9 s
(2) 6 s
(3) 55 s
(4) 12 s

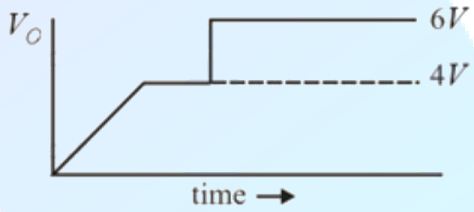
Q20. Two Zener diodes (A and B) having breakdown voltages of 6 V and 4 V respectively, are connected as shown in the circuit below. The output voltage V_0 variation with input voltage linearly increasing with time, is given by

$\left(V_{\text{input}} = 0V \text{ at } t = 0\right)$

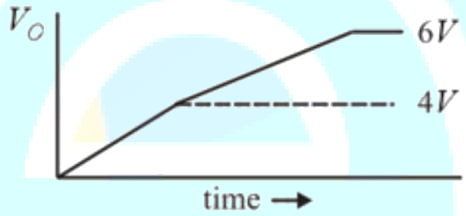
(1) V_O



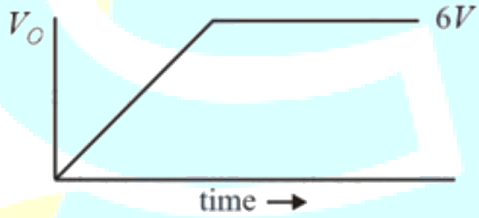
(2)



(3)

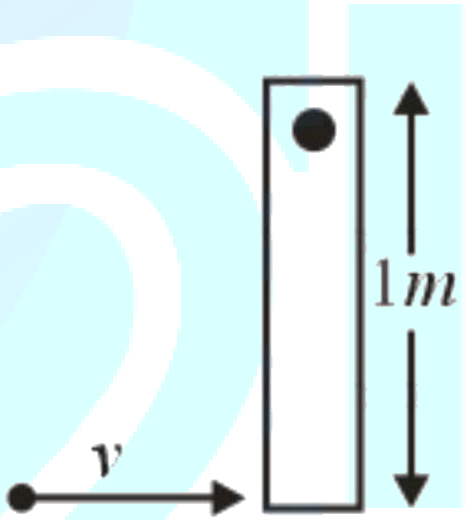


(4)



Q21. A body of mass 2 kg is driven by an engine delivering a constant power of 1 J s^{-1}. the body starts from rest and moves in a straight line. After 9 s , the body has moved a distance (in m)....

Q22. A thin rod of mass 0.9 kg and length 1 m is suspended, at rest, from one end so that it can freely oscillate in the vertical plane. A particle of move 0.1 kg moving in a straight line with velocity 80 m s^{-1} hits the rod at its bottom most point and sticks to it (see figure). The angular speed (in rads^{-1}) of the rod immediately after the collision will be



Q23. Nitrogen gas is at 300 °C temperature. The temperature (in K) at which the rms speed of a H_2 molecule would be equal to the rms speed of a nitrogen molecule, is . (Molar mass of N_2 gas 28 g).

Q24. A prism of angle $A = 1°\mu = 1.5$. A good estimate for the minimum angle of deviation (in degrees) is close to $\frac{N}{10}$. Value of N is

Q25. The surface of a metal is illuminated alternately with photons of energies $E_1 = 4\text{eV}$ and $E_2 = 2.5\text{eV}$ respectively. The ratio of maximum speeds of the photoelectrons emitted in the two cases is 2 . The work function of the metal in (eV) is.

Q26. The correct statement about probability density (except at infinite distance from nucleus) is :

(1) It can be zero for 1 s orbital

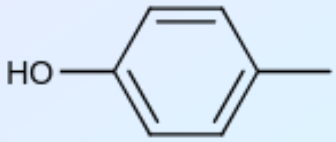
(2) It can be negative for $2p$ orbital

(3) It can be zero for $3p$ orbital

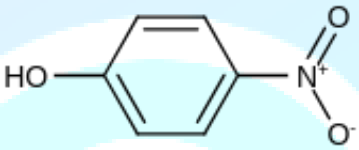
(4) It can never be zero for 2 s orbital

Q27. The correct order of the ionic radii of $O^{2-}, N^{3-}, F^{-}, Mg^{2+}, Na^{+}$and Al^{3+} is :
(1) $N^{3-} < O^{2-} < F^{-} < Na^{+} < Mg^{2} < Al^{3+}$
(2) $Al^{3+} < Na^{+} < Mg^{2+} < O^{2-} < F^{-} < N^{3-}$
(3) $Al^{3+} < Mg^{2+} < Na^{+} < F^{-} < O^{2-} < N^{3-}$
(4) $N^{3-} < F^{-} < O^{2-} < Mg^{2+} < Na^{+} < Al^{3+}$

Q28. The increasing order of boiling points of the following compounds is :



I



II

III

IV
(1) I < III < IV < II
(2) I < IV < II < III
(3) IV < I < II < III
(4) III < I < II < IV

Q29. The compound that has the largest $H - M - H$ bond angle ($M = N, O, S, C$), is :
(1) H_2O
(2) NH_3
(3) H_2S
(4) CH_4

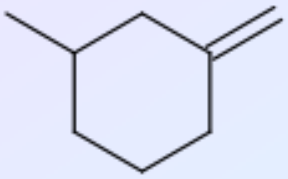
Q30. Lattice enthalpy and enthalpy of solution of NaCl are $788 kJmol^{-1}$ and $4k Jmol^{-1}$, respectively. The hydration enthalpy of $NaCl$ is:
(1) $-780 kJmol^{-1}$
(2) $780 kJmol^{-1}$
(3) $-784 kJmol^{-1}$
(4) $784 kJmol^{-1}$

Q31.Hydrogen peroxide, in the pure state, is:
(1) non-planar and almost colorless
(2) Linear and blue in color
(3) Linear and almost colorless
(4) planar and blue in color

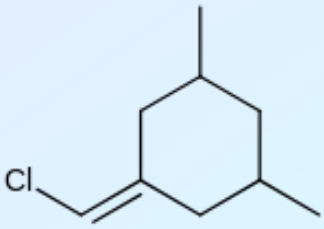
Q32. The one that is NOT suitable for the removal of permanent hardness of water is :
(1) Clark's method
(2) Ion-exchange method
(3) Calgon's method
(4) Treatment with sodium carbonate

Q33. Among the following compounds, geometrical isomerism is exhibited by :
(1)

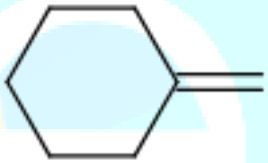
(2) CHCl



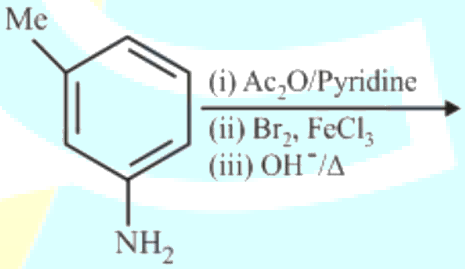
(3)



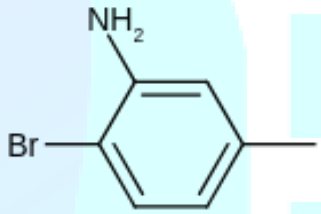
(4) CHCl



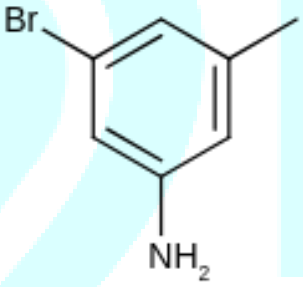
Q34. The final major product of the following reaction is :



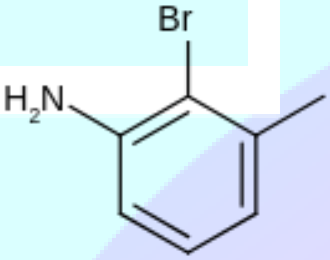
(1) Me



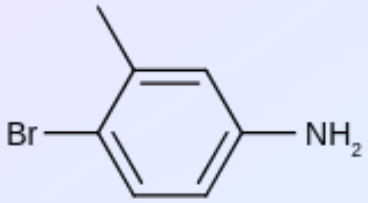
(2)



(3) Me



(4)



Q35. The major product formed in the following reaction is :

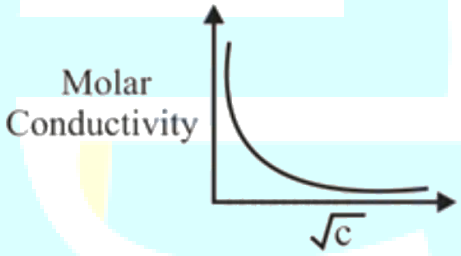
$CH_2CH = CHCH(CH_3)_2 \xrightarrow{HBr}$

(1) $CH_3CH_2CH(Br)CH(CH_3)_2$
(2) $CH_3CH(Br)CH_2CH(CH_3)_2$
(3) $Br(CH_2)_3CH(CH_3)_2$
(4) $CH_3CH_2CH_2C(Br)(CH_3)_2$

Q36. An element crystallises in a face-centred cubic (fcc) unit cell with cell edge a. The distance between the centres of two nearest octahedral voids in the crystal lattice is:

(1) $\frac{a}{\sqrt{2}}$
(2) a
(3) $\sqrt{2}a$
(4) $\frac{a}{2}$

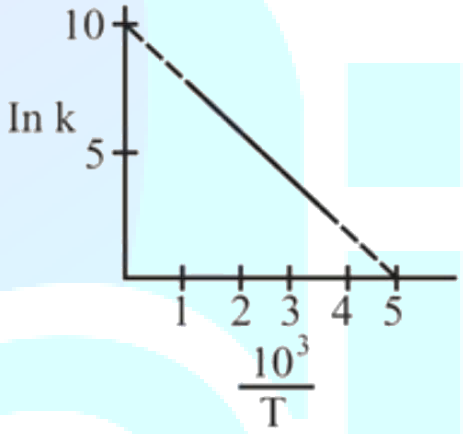
Q37. The variation of molar conductively with concentration of an electrolyte (X) in aqueous solution is shown in the given figure.



The electrolyte X is :

(1) HCl
(2) NaCl
(3) KNO_3
(4) CH_3COOH

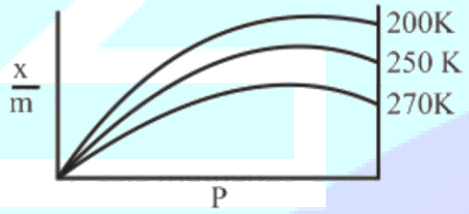
Q38. The rate constant (k) of a reaction is measured at different temperature (T), and the data are plotted in the given figure. the activation energy of the reaction in $kJmol^{-1}$ is : (R is gas constant)



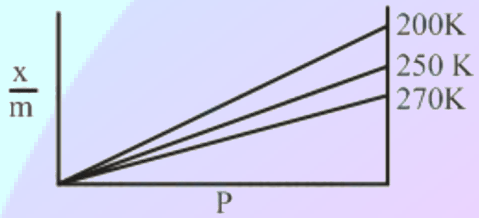
(1) $2/R$
(2) $1/R$
(3) R
(4) $2R$

Q39. Adsorption of a gas follows Freudlich adsorption isotherm. If x is the mass of the gas adsorbed on mass m of the adsorbent, the correct plot of $\frac{x}{m}$ versus p is:

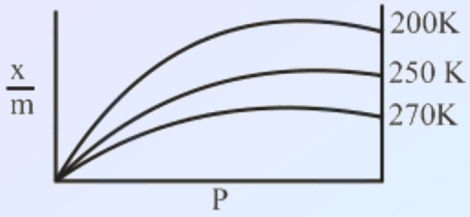
(1)



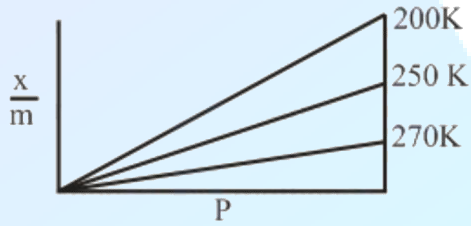
(2)



(3)



(4)

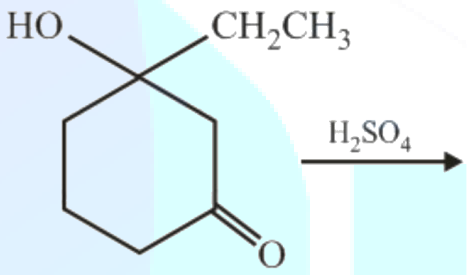


Q40. Boron and silicon of very high purity can be obtained through :
(1) liquation
(2) zone refining
(3) vapour phase refining
(4) electrolytic refining

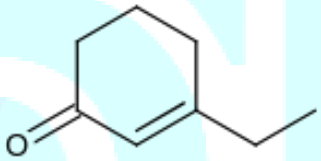
Q41. Reaction of ammonia with excess Cl_2 gives :
(1) NH_4Cl and N_2
(2) NH_4Cl and HCl
(3) NCl_3 and NH_4Cl
(4) NCl_3 and HCl

Q42. Consider the complex ions, trans-$[Co(en)_2Cl_2]^+$ (A) and cis $-[Co(en)_2Cl_2]^+$(B). The correct statement regarding them is :
(1) both (A) and (B) cannot be optically active.
(3) both (A) and (B) can be optically active.
(2) (A) can be optically active, but (B) cannot be optically active.
(4) (A) cannot be optically active, but (B) can be optically active.

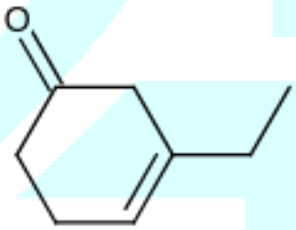
Q43. The major product of the following reaction is :



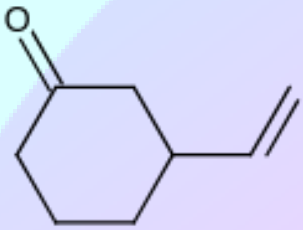
(1)



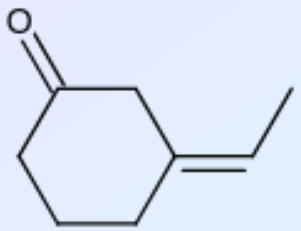
(2)



(3)

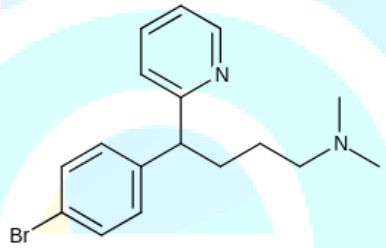


(4)



Q44. Which one of the following polymers is not obtained by condensation polymerisation?
(1) Nylon 6, 6
(2) Buna - N
(3) Bakelite
(4) Nylon 6

Q45. The following molecule acts as an :



(1) Antiseptic
(2) Anti-depressant
(3) Anti-bacterial
(4) Anti-histamine

Q46. For a dimerization reaction,
$2\ A(g) \rightarrow A_2(g)$
at 298 K, $\Delta U^- = -20 kJmol^{-1}, \Delta S^- = -30 JK^{-1}\ mol^{-1}$, then the ΔG^-will be ……J.
Q47. For a reaction $X + Y = 2Z$, 1.0 mol of X, 1.5 mol of Y and 0.5 mol of Z were taken in a 1 L vessel and allowed to react. At equilibrium, the concentration of Z was $1.0 molL^{-1}$. the equilibrium constant of the reaction is $\frac{x}{15}$. The value of x is
Q48. The volume, in mL , of $0.02M K_2Cr_2O_7$, solution required to react with 0.288 g of ferrous oxalate in acidic medium is (Molar mass of $Fe = 56 gmol^{-1}$)

Q49. Considering that $\Delta_0 > P$, the magnetic moment (in BM) of $[Ru(H_2O)_6]^{2+}$ would be
Q50. The number of chiral carbons present in sucrose is
Q51. If α and β are the roots of the equation, $7x^2 - 3x - 2 = 0$, then the value of $\frac{\alpha}{1-\alpha^2} + \frac{\beta}{1-\beta^2}$ is equal to:
(1) $\frac{27}{32}$
(2) $\frac{1}{24}$
(3) $\frac{3}{8}$
(4) $\frac{27}{16}$

Q52. The value of $\left(\frac{-1+i\sqrt{3}}{1-i}\right)^{30}$ is :
(1) 6^5
(2) 2^{15}i
(3) -2^{15}
(4) -2^{15}i

Q53. There are 3 sections in a question paper and each section contains 5 questions. A candidate has to answer a total of 5 questions, choosing at least one question from each section. Then the number of ways, in which the candidate can choose the questions, is:
(1) 3000
(2) 1500
(3) 2255
(4) 2250

Q54. If the sum of the second, third and fourth terms of a positive term G.P. is 3 and the sum of its sixth, seventh and eighth terms is 243 , then the sum of the first 50 terms of this G.P. is :
(1) $\frac{1}{26}(3^{49} - 1)$
(2) $\frac{1}{26}(3^{50} - 1)$
(3) $\frac{2}{13}(3^{50} - 1)$
(4) $\frac{1}{13}(3^{50} - 1)$

Q55. If the sum of the first 20 terms of the series $\log_{(7^{1/2})} x + \log_{(7^{1/3})} x + \log_{(7^{1/4})} x + \cdots$ is 460 , then x is equal to:
(1) 7^2

(2) $7^{1/2}$
(3) e^2
(4) $7^{46/21}$

Q56. If $L = \sin^2\left(\frac{\pi}{16}\right) - \sin^2\left(\frac{\pi}{8}\right)$ and $M = \cos^2\left(\frac{\pi}{16}\right) - \sin^2\left(\frac{\pi}{8}\right)$
(1) $L = -\frac{1}{2\sqrt{2}} + \frac{1}{2}\cos\frac{\pi}{8}$
(2) $L = \frac{1}{4\sqrt{2}} - \frac{1}{4}\cos\frac{\pi}{8}$
(3) $M = \frac{1}{4\sqrt{2}} + \frac{1}{4}\cos\frac{\pi}{8}$
(4) $M = \frac{1}{2\sqrt{2}} + \frac{1}{2}\cos\frac{\pi}{8}$

Q57. If the length of the chord of the circle, $x^2 + y^2 = r^2 (r > 0)$ along the line, $y - 2x = 3$ is r, then r^2 is equal to:
(1) $\frac{9}{5}$
(2) 12
(3) $\frac{24}{5}$
(4) $\frac{12}{5}$

Q58. If the line $y = mx + c$ is a common tangent to the hyperbola $\frac{x^2}{100} - \frac{y^2}{64} = 1$ and the circle $x^2 + y^2 = 36$, then which one of the following is true?
(1) $c^2 = 369$
(2) $5m = 4$
(3) $4c^2 = 369$
(4) $8m + 5 = 0$

Q59. $\lim_{x\to 0} \frac{x\left(e^{\left(\sqrt{1+x^2+x^4}-1\right)/x}-1\right)}{\sqrt{1+x^2+x^4}-1}$
(1) is equal to $\sqrt{e}$
(2) is equal to 1
(3) is equal to 0
(4) does not exist

Q60. The statement $(p \to (q \to p)) \to (p \to (p \vee q))$ is :
(1) equivalent to $(p \wedge q) \vee (\sim q)$
(2) a contradiction
(3) equivalent to $(p \vee q) \wedge (\sim p)$
(4) a tautology

Q61. If the mean and the standard deviation of the data $3,5,7,a,b$ are 5 and 2 respectively, then a and b are the roots of the equation:
(1) $x^2 - 10x + 18 = 0$
(2) $2x^2 - 20x + 19 = 0$
(3) $x^2 - 10x + 19 = 0$
(4) $x^2 - 20x + 18 = 0$

Q62. If the system of linear equations
$x + y + 3z = 0$
$x + 3y + k^2 z = 0$
$3x + y + 3z = 0$
has a non-zero solution (x, y, z) for some k ∈ R, then $x + \left(\frac{y}{z}\right)$ is equal to :
(1) -3
(2) 9
(3) 3
(4) -9

Q63. If $a + x = b + y = c + z + 1$, where a, b, c, x, y, z are non-zero distinct real numbers, then $\begin{vmatrix} x & a+y & x+a \\ y & b+y & y+b \\ z & c+y & z+c \end{vmatrix}$ is equal to :
(1) $y(b - a)$
(2) $y(a - b)$
(3) 0
(4) $y(a - c)$

Q64. The derivative of $\tan^{-1}\left(\frac{\sqrt{1+x^2}-1}{x}\right)$ with respect to $\tan^{-1}\left(\frac{2x\sqrt{1-x^2}}{1-2x^2}\right)$ at $x = \frac{1}{2}$ is :
(1) $\frac{2\sqrt{3}}{5}$
(2) $\frac{\sqrt{3}}{12}$
(3) $\frac{2\sqrt{3}}{3}$
(4) $\frac{\sqrt{3}}{10}$

Q65. If $x = 1$ is a critical point of the function $f(x) = (3x^2 + ax - 2 - a)e^x$, then
(1) $x = 1$ and $x = -\frac{2}{3}$ are local minima of f
(2) $x = 1$ and $x = -\frac{2}{3}$ is a local maxima of f
(3) $x = 1$ is a local maxima and $x = -\frac{2}{2}$ is a local
(4) $x = 1$ is a local minima and $x = -\frac{2}{3}$ are local minima of f maxima of f

Q66. Which of the following points lies on the tangent to the curve $x^4 e^y + 2\sqrt{y+1} = 3$ at the point (1,0) ?
(1) (2,2)

(2) $(2,6)$
(3) $(-2,6)$
(4) $(-2,4)$

Q67. If $\int \frac{\cos\theta}{5+7\sin\theta-2\cos^2\theta}d\theta = A\log_e|B(\theta)| + C$, where C is a constant of integration, then $\frac{B(\theta)}{A}$ can be:
(1) $\frac{2\sin\theta+1}{\sin\theta+3}$
(2) $\frac{2\sin\theta+1}{5(\sin\theta+3)}$
(3) $\frac{5(\sin\theta+3)}{2\sin\theta+1}$
(4) $\frac{5(2\sin\theta+1)}{\sin\theta+3}$

Q68. The area (in sq. units) of the region $A = \{(x,y): (x-1)[x] \le y \le 2\sqrt{x}, 0 \le x \le 2\}$, where $[t]$ denotes the greatest integer function, is :
(1) $\frac{8}{3}\sqrt{2}-\frac{1}{2}$
(2) $\frac{4}{3}\sqrt{2}+1$
(3) $\frac{8}{3}\sqrt{2}-1$
(4) $\frac{4}{3}\sqrt{2}-\frac{1}{2}$

Q69. Let $y = y(x)$ be the solution of the differential equation $\cos x\frac{dy}{dx} + 2y\sin x = \sin 2x, x \in \left(0,\frac{\pi}{2}\right)$ If $y(\pi/3) = 0$, then $y(\pi/4)$ is equal to :
(1) $2-\sqrt{2}$
(2) $2+\sqrt{2}$
(3) $\sqrt{2}-2$
(4) $\frac{1}{\sqrt{2}}-1$

Q70.If for some, $\alpha \in$ R, the lines $L_1: \frac{x+1}{2} = \frac{y-2}{-1} = \frac{z-1}{1}$ and $L_2: \frac{x+2}{\alpha} = \frac{y+1}{5-\alpha} = \frac{z+1}{1}$ are coplanar, then the line L_2 passes through the point :
(1) $(10,2,2)$
(2) $(2,-10,-2)$
(3) $(10,-2,-2)$
(4) $(-2,10,2)$

Q71. The coefficient of x^4 in the expansion of $(1+x+x^2+x^3)^6$ in powers of x, is ....
Q72. Let $A = \{a,b,c\}$ and $B = \{1,2,3,4\}$. Then the number of elements in the set $C = \{f: A \to B \mid 2 \in f(A)$ and f is not one-one $\}$ is...

Q73. If the lines $x+y=a$ and $x-y=b$ touch the curve $y = x^2-3x+2$ at the points where the curve intersects the x-axis, then $\frac{a}{b}$ is equal to ...

Q74. Let the vectors $\vec{a},\vec{b},\vec{c}$ be such that $|\vec{a}| = 2, |\vec{b}| = 4$ and $|\vec{c}| = 4$. If the projection of $\vec{b}$ on $\vec{a}$ is equal to the projection of $\vec{c}$ on $\vec{a}$ and $\vec{b}$ is perpendicular to $\vec{c}$, then the value of $|\vec{a}+\vec{b}-\vec{c}|$ is ...

Q75. In a bombing attack, there is 50% chance that a bomb will hit the target. At least two independent hits are required to destroy the target completely. Then the minimum number of bombs, that must be dropped to ensure that there is at least 99% chance of completely destroying the target, is .....

ANSWER KEYS

1. (1)	2. (1)	3. (2)	4. (1)	5. (1)	6. (1)	7. (3)	8. (1)
9. (1)	10. (3)	11. (4)	12. (2)	13. (4)	14. (4)	15. (2)	16. (4)
17. (4)	18. (2)	19.(1)	20. (3)	21. (18)	22. (20)	23. (41)	24. (5) [a]
25. (2)	26. (3)	27. (3)	28. (2)	29. (4)	30. (3)	31. (1)	32. (1)
33. (2)	34. (4)	35. (4)	36. (1)	37. (4)	38. (4)	39. (1)	40. (2)
41. (4)	42. (4)	43. (1)	44. (2)	45. (4)	46. (13538)	47. (16)	48. (100)
49. (0)	50. (9)	51. (4)	52. (4)	53. (4)	54. (2)	55. (1)	56. (4)
57. (4)	58. (3)	59. (2)	60. (4)	61. (3)	62. (1)	63. (2)	64. (4)
65. (4)	66. (3)	67. (4)	68. (1)	69. (3)	70. (2)	71. (120)	72. (19)
73. (0.5)	74. (6)	75. (11)					