Sample Paper

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Full Test

Q.No. 1 Charge is distributed within a sphere of radius R with a volume charge density $\rho(\mathrm{r}) = \frac{\mathrm{A}}{\mathrm{r}^2}\mathrm{e}^{-2\mathrm{r}/\mathrm{a}}$ where A and a are constants. If Q is the total charge of this charge distribution, the radius R is:

(A) $\mathrm{a}\log\left(\frac{1}{1-\frac{\mathrm{Q}}{2\pi\mathrm{aA}}}\right)$

(B) $\mathrm{a}\log\left(1-\frac{\mathrm{Q}}{2\pi\mathrm{aA}}\right)$

(C) $\frac{\mathrm{a}}{2}\log\left(1-\frac{\mathrm{Q}}{2\pi\mathrm{aA}}\right)$

(D) $\frac{a}{2}\log|\frac{1}{1-\frac{Q}{2\pi aA}})$

Q.No. 2 A ratio of the 5th term from the beginning to the 5th term from the end in the binomial expansion of $\left(2^{1/3}+\frac{1}{2(3)^{1/3}}\right)^{10}$ is:

(A) $4(36)^{\frac{1}{3}}:1$

(B) $1:2(6)^{\frac{1}{3}}$

(C) $2(36)^{\frac{1}{3}}:1$

(D) $1:4(16)^{\frac{1}{3}}$

Q.No. 3 The maximum area (in sq. units) of a rectangle having its base on the x-axis and its other two vertices on the parabola, $y=12-x^2$ such that the rectangle lies inside the parabola, is:

(A) 36

(B) $18\sqrt{3}$

(C) $20\sqrt{2}$

(D) 32

Q.No. 4 Correct statements among a tod regarding silicones are : (a) They are polymers with hydrophobic character. (b) They are biocompatible. (c) In general, they have high thermal stability and low dielectric strength. (d) Usually, they are resistant to oxidation and used as greases.

(A) (a), (b), (c) and (d)

(B) (a) and (b) only

(C) (a), (b) and (c) only

(D) (a), (b) and (d) only

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Q.No. 5 The combustion of benzene (l) gives CO_2(g) and H_2O(l). Given that heat of combustion of benzene at constant volume is −3263.9 kJ mol^{-1} at 25° C; heat of combustion (in kJ mol^{-1}) of benzene at constant pressure will be : (R=8.314 JK^{-1} mol^{-1})

(A) 4152.6

(B) -452.46

(C) 3260

(D) -3267.6

Q.No. 6 If the system of linear equations x+ky+3z=0 3x+ky−2z=0 2x+4y−3z=0 has a non-zero solution (x, y, z), then xz/y^2 is equal to :

(A) -10

(B) 10

(C) -30

(D) 30

Q.No. 7 Let a,b and c be the 7th, 11th and 13th terms respectively of a non-constant A.P. If these are also the three consecutive terms of a G.P., then a/c is equal to

(A) 2

(B) ½

(C) 4

(D) 7/13

Q.No. 8 Let $\vec{a} = 2\hat{i} + \lambda_1\hat{j} + 3\hat{k}, \vec{b} = 4\hat{i} + (3 - \lambda_2)\hat{j} + 6\hat{k}$ and $\vec{c} = 3\hat{i} + 6\hat{j} + (\lambda_3 - 1)\hat{k}$ be three vectors such that $\vec{b} = 2\vec{a}$ and $\vec{a}$ is perpendicular to $\vec{c}$. Then a possible value of $(\lambda_1, \lambda_2, \lambda_3)$ is :

(A) $\left(-\frac{1}{2}, 4, 0\right)$

(B) $\left(\frac{1}{2}, 4, -2\right)$

(C) (1,3,1)

(D) (1,5,1)

Q.No. 9 A solution of sodium sulfate contains 92 g of Na^+ ions per kilogram of water. The molality of Na^+ ions in that solution in mol kg^{-1} is:

(A) 8

(B) 4

(C) 12

(D) 16

Q.No. 10 From 6 different novels and 3 different dictionaries, 4 novels and 1 dictionary are to be selected and arranged in a row on a shelf so that the dictionary is always in the middle. The number of such arrangements is :

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(A) at least 1000

(B) less than 500

(C) at least 500 but less than 750

(D) at least 750 but less than 1000

Q.No. 11 A power transmission line feeds input power at 2300 V to a step down transformer with its primary windings having 4000 turns. The output power is delivered at 230 V by the transformer. If the current in the primary of the transformer is 5A and its efficiency is 90%, the output current would be:

(A) 25 A

(B) 50 A

(C) 45 A

(D) 35 A

Q.No. 12 The pitch and the number of divisions, on the circular scale, for a given screw gauge are 0.5 mm and 100 respectively. When the screw gauge is fully tightened without any object, the zero of its circular scale lies 3 divisions below the mean line. The readings of the main scale and the circular scale, for a thin sheet, are 5.5 mm and 48 respectively, the thickness of this sheet is :

(A) 5.950 mm

(B) 5.755 mm

(C) 5.725 mm

(D) 5.740 mm

Q.No. 13 'The value of c in the Lagrange's mean value theorem for the function $f(x) = x^3 + 8x + 11$, when $x \in [0, 1]$ is :

(A) $\frac{4-\sqrt{5}}{3}$

(B) $\frac{4-\sqrt{7}}{3}$

(C) 2/3

(D) $\frac{\sqrt{7}-2}{3}$

Q.No. 14 An emf of 20 V is applied at time t = 0 to a circuit containing in series 10 mH inductor and 5 Ω resistor. The ratio of the currents at time $t = \infty$ and at t = 40 s is close to : (Take e^2=7.389)

(A) 1.06

(B) 1.15

(C) 1.46

(D) 0.84

Q.No. 15 The sum of the following series $1 + 6 + \frac{9(1^2+2^2+3^2)}{7} + \frac{12(1^2+2^2+3^2+4^2)}{9} + \frac{15(1^2+2^2+\ldots+5^2)}{11} + \cdots$ upto 15 terms is

(A) 7510

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(B) 7820

(C) 7830

(D) 7520

Q.No. 16 Which of the following arrangements does not represent the correct order of the property stated against it ?

(A) $Ni^{2+} < Co^{2+} < Fe^{2+} < Mn^{2+}$: ionic size

(B) $Co^{3+} < Fe^{3+} < Cr^{3+} < Sc^{3+}$: stability in aqueous solution

(C) Sc < Ti < Cr < Mn : number of oxidation states

(D) $V^{2+} > Cr^{2+} > Mn^{2+} > Fe^{2+}$: paramagnetic behaviour

Q.No. 17 In a hydrogen like atom electron makes transition from an energy level with quantum number n to another with quantum number (n – 1). If n >> 1, the frequency of radiation emitted is proportional to

(A) $1/n^2$

(B) $1/n^{3/2}$

(C) $1/n^3$

(D) 1/n

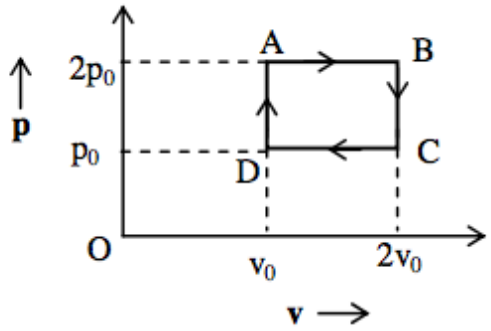
Q.No. 18 The integral $\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} \frac{dx}{1+\cos x}$ is equal to :

(A) 2

(B) 4

(C) -1

(D) -2



Q.No. 19 The above p-v diagram represents the thermodynamic cycle of an engine, operating with an ideal monoatomic gas. The amount of heat extracted from the source in a single cycle is

(A) $(13/2)p_0$ v

(B) $(11/2)p_0$ v

(C) 4 p_0 v

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(D) p_0 v

Q.No. 20 The pH of rain water , is approximately :

(A) 7.5

(B) 6.5

(C) 7.0

(D) 5.6

Q.No. 21 A uniform metallic wire has a resistance of 18Ω and is bent into an equilateral triangle. Then, the resistance between any two vertices of the triangle is :

(A) 2Ω

(B) 8Ω

(C) 4Ω

(D) 12Ω

Q.No. 22 The integral $\int \frac{\sin^2 x \cos^2 x}{(\sin^5 x + \cos^3 x \sin^2 x + \sin^3 x \cos^2 x + \cos^5 x)^2} dx$ is equal to :

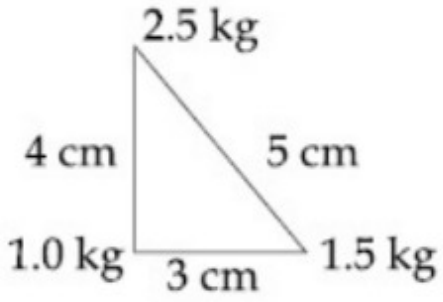
(A) $\frac{1}{3(1+\tan^3 x)} + C$

(B) $\frac{-1}{3(1+\tan^3 x)} + C$

(C) $\frac{1}{1+\cot^3 x} + C$

(D) $\frac{-1}{1+\cot^3 x} + C$

Q.No. 23 Three point particles of masses 1kg , 1.5kg and 2.5 kg are placed at three corners of a right angle triangle of sides 4.0 cm, 3.0 cm and 5.0 cm as shown in the figure. The center of mass of the system is at a



point :

(A) 0.6 cm right and 2.0 cm above 1kg mass

(B) 1.5 cm right and 1.2 cm above 1kg mass

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(C) 2.0 cm right and 0.9 cm above 1kg mass

(D) 0.9 cm right and 2.0 cm above 1kg mass

Q.No. 24 $\lim_{x\to 1^-} \frac{\sqrt{\pi}-\sqrt{2\sin^{-1}x}}{\sqrt{1-x}}$

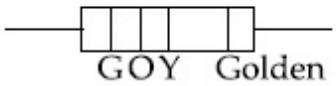
(A) $\sqrt{\pi}$

(B) $\frac{1}{\sqrt{2\pi}}$

(C) $\sqrt{\frac{\pi}{2}}$

(D) $\sqrt{\frac{2}{\pi}}$

Q.No. 25 A carbon resistance has a following colour code. What is the value of the resistance ?



(A) $64\text{k}\Omega \pm 10\%$

(B) $530\text{k}\Omega \pm 5\%$

(C) $5.3\text{M}\Omega \pm 5\%$

(D) $6.4\text{M}\Omega \pm 5\%$

Q.No. 26 The sum of the co-efficients of all odd degree terms in the expansion of $(x+\sqrt{x^3-1})^5+(x-\sqrt{x^3-1})^5$,$(x>1)$ in:

(A) -1

(B) 0

(C) 1

(D) 2

Q.No. 27 A paramagnetic substance in the form of a cube with sides 1 cm has a magnetic dipole moment of $20 \times 10^{-6}\text{J/T}$ when a magnetic intensity of $60 \times 10^3\text{A/m}$ is applied. Its magnetic susceptibility is :

(A) 3.3 x 10-2

(B) 4.3 x 10-2

(C) 2.3 x 10-2

(D) 3.3 x 10-4

Q.No. 28 A galvanometer, whose resistance is 50 ohm, has 25 divisions in it. When a current of 4 x A passes through it, its needle (pointer) deflects by one division.To use this galvanometer as a voltmeter of range 2.5 V, it should be connected to a resistance of:

(A) 200 ohm

(B) 6250 ohm

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(C) 6200 ohm

(D) 250 ohm

Q.No. 29 Let y=y(x) be the solution of the differential sinx dy/dx+y cosx=4x,x∈(0,π). If y(π/2)=0, then y(π/6) is equal to:

(A) $4/9\sqrt{3}\ \pi^2$

(B) $-8/9\sqrt{3}\ \pi^2$

(C) $-8/9\ \pi^2$

(D) $-4/9\ \pi^2$

Q.No. 30 The values of K_p/K_c for the following reactions at 300 K are, respectively : (At 300 K, $RT = 262 dm^3 atm mol^{-1}$) $N_2(g) + O_2(g) = 2NO(g)$ $N_2O_4(g) = 2NO_2(g)$ $N_2(g) + 3H_2(g) = 2NH_3(g)$

(A) $\begin{matrix} 262 dm^3 atm mol^{-1} \\ 606.0 dm^6 atm^2 mol^{-2} \end{matrix}$

(B) $\begin{matrix} 1,1 \times 10^{-2} dm^{-3} atm^{-1} mol \\ 606 dm^6 atm^2 mol^{-2} \end{matrix}$

(C) $\begin{matrix} 1, 262 dm^3 \text{ atm } mol^{-1} \text{ , } \\ 606.0 dm^6 atm^2 mol^{-2} \end{matrix}$

(D) $\begin{matrix} 1, 262 dm^3 atm mol^{-1} \text{ .} \\ 1.65 \times 10^{-3} dm^{-6} atm^{-2} mol^2 \end{matrix}$

Q.No. 31 A thin lens made of glass (refractive index = 1.5) of focal length f = 16 cm is immersed in a liquid of refractive index 1.42. If its focal length in liquid is f_1, then the ratio f_1/f is closest to the integer :

(A) 1

(B) 9

(C) 5

(D) 17

Q.No. 32 Two coherent sources produce waves of different intensities which interfere. After interference, the ratio of the maximum intensity to the minimum intensity is 16. The intensity of the waves are in the ratio :

(A) 16:9

(B) 5:3

(C) 25:9

(D) 4:1

Q.No. 33 Consider the statement: $"P(n) : n^2 - n + 41$ is prime." Then which one of the following is true?

(A) P(5) is false but P(3) is true.

(B) Both P(3) and P(5) are false.

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(C) P(3) is false but P(5) is true.

(D) Both P(3) and P(5) are true.

Q.No. 34 If $A = \begin{bmatrix} 1 & \sin\theta & 1 \\ -\sin\theta & 1 & \sin\theta \\ -1 & -\sin\theta & 1 \end{bmatrix}$; then for all $\theta \in \left(\frac{3\pi}{4}, \frac{5\pi}{4}\right)$, det (A) det (A) lies in the interval :

(A) $\left(\frac{3}{2}, 3\right]$

(B) $\left[\frac{5}{2}, 4\right)$

(C) $\left(1, \frac{5}{2}\right]$

(D) $\left(0, \frac{3}{2}\right]$

Q.No. 35 Energy of an electron is given by E= -2.178 x 10^{-18}J. Wavelength of light required to excite an electron in an hydrogen atom from level n = 1 to n = 2 will be.

(A) 2.816 × 10^{-7} m

(B) 6.500 × 10^{-7} m

(C) 8.500 × 10^{-7} m

(D) 1.214 × 10^{-7} m

Q.No. 36 Let $x^k + y^k = a^k, (a, k > 0)$ and $\frac{dy}{dx} + \left(\frac{y}{x}\right)^{\frac{1}{3}} = 0$ then k is

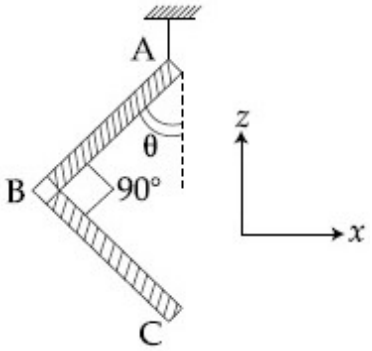
(A) 3/2

(B) 4/3

(C) 2/3

(D) ⅓

Q.No. 37 An L-shaped object, made of thin rods of uniform mass density, is suspended with a string as shown in figure. If AB = BC, and the angle made by AB with downward vertical is θ, then:



(A) tanθ = $\frac{2}{\sqrt{3}}$

(B) tanθ = $\frac{1}{2}$

(C) tanθ = $\frac{1}{2\sqrt{3}}$

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(D) $\tan\theta = \frac{1}{3}$

Q.No. 38 An unbiased coin is tossed 5 times. Suppose that a variable X is assigned the value k when k consecutive heads are obtained for k =3,4,5 otherwise X takes the value -1. Then the expected value of X is :

(A) 3/16

(B) 1/8

(C) -(3/16)

(D) -(⅛)

Q.No. 39 The locus of the mid-points the perpendiculars drawn from points on the line, x = 2y to the line x = y is :

(A) 2x - 3y = 0

(B) 5x - 7y = 0

(C) 3x - 5y = 0

(D) 7x - 5y = 0

Q.No. 40 In amplitude modulation, sinusoidal carrier frequency used is denoted by ω_c and the signal frequency is denoted by ω_m. The bandwidth ($\Delta\omega_m$) of the signal is such that $\Delta\omega_m << \omega_c$. Which of the following frequencies is not contained in the modulated wave ?

(A) ω_m

(B) ω_c

(C) $\omega_m + \omega_c$

(D) $\omega_c - \omega_m$

Q.No. 41 The number of all possible positive integral values of a for which the roots of the quadratic equation, $6x^2 - 11x + \alpha = 0$ are rational numbers is :

(A) 2

(B) 3

(C) 5

(D) 4

Q.No. 42 Let y = y(x) be the solution curve of the differential equation, $\left(y^2 - x\right)\frac{dy}{dx} = 1$. This curve intersects the x-axis at a point whose abscissa is :

(A) 2 - e

(B) - e

(C) 2

(D) 2 + e

Q.No. 43 Which of the following statements is false ?

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(A) Wheatstone bridge is the most sensitive when all the four resistances are of the same order of magnitude.

(B) In a balanced wheatstone bridge if the cell and the galvanometer are exchanged, the null point is disturbed.

(C) A rheostat can be used as a potential divider.

(D) Kirchhoff's second law represents energy conservation.

Q.No. 44 An urn contains 5 red and 2 green balls. A ball is drawn at random from the urn. If the drawn ball is green, then a red ball is added to the urn and if the drawn ball is red, then a green ball is added to the urn; the original ball is not returned to the urn. Now, a second ball is drawn at random from it. The probability that the second ball is red, is:

(A) 27/49

(B) 32/49

(C) 21/49

(D) 26/49

Q.No. 45 If the point $(2, \alpha, \beta)$ lies on the plane which passes through the points (3, 4, 2) and (7,0, 6) and is perpendicular to the plane 2x - 5y=15, then $2\alpha - 3\beta$ is equal to :

(A) 7

(B) 12

(C) 17

(D) 5

Q.No. 46 The amplitude of a damped oscillator decreases to 0.9 times its original magnitude is 5s. In another 10s it will decrease to α times its original magnitude, where α equals.

(A) 0.81

(B) 0.729

(C) 0.6

(D) 0.7

Q.No. 47 A simple pendulum of length 1 m is oscillating with an angular frequency 10 rad/s. The support of the pendulum starts oscillating up and down with a small angular frequency of 1 rad/s and an amplitude of 10^{-2}m. The relative change in the angular frequency of the pendulum is best given by :

(A) 1 rad/s

(B) $10^{-5}\mathrm{rad/s}$

(C) $10^{-3}\mathrm{rad/s}$

(D) $10^{-1}\mathrm{rad/s}$

Q.No. 48 The area of the region $A = \{(x, y) : 0 \leq y \leq x|x| + 1 \text{ and } -1 \leq x \leq 1\}$ in sq. units, is :

(A) 2

(B) 2/3

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(C) 1/3

(D) 4/3

Q.No. 49 The coagulating power of electrolytes having ions Na^+, Al^{3+} and Ba^{2+} for arsenic sulphide sol increases in the order

(A) $Na^+ < Ba^{2+} < Al^{3+}$

(B) $Ba^{2+} < Na^+ < Al^{3+}$

(C) $Al^{3+} < Na^+ < Ba^{2+}$

(D) $Al^{3+} < Ba^{2+} < Na^+$

Q.No. 50 For 1 molal aqueous solution of the following compounds, which one will show the highest freezing point ?

(A) $[Co(H_2O)_6]Cl_3$

(B) $[Co(H_2O)_5Cl]Cl_2 . H_2O$

(C) $[Co(H_2O)_4Cl_2]Cl . 2H_2O$

(D) $[Co(H_2O)_3Cl_3]. 3H_2O$

Q.No. 51 Amongst the following statements , that which was not proposed by Dalton was :

(A) Chemical reactions involve reorganization of atoms. These are neither created nor destroyed in a chemical reaction.

(B) all the atoms of a given element have identical properties including identical mass. Atoms of different elements differ in mass.

(C) When gases combine or reproduce in a chemical reaction they do so in a simple ratio by volume provided all gases are at the same T and P.

(D) matter consists of indivisible atoms.

Q.No. 52

Given

$C_{(graphite)} + O_2(g) \rightarrow CO_2(g)$;
$\Delta_r H^\circ = -393.5 \text{ kJ mol}^{-1}$

$H_2(g) + \frac{1}{2}O_2(g) \rightarrow H_2O(l)$;
$\Delta_r H^\circ = -285.8 \text{ kJ mol}^{-1}$

$CO_2(g) + 2H_2O(l) \rightarrow CH_4(g) + 2O_2(g)$;
$\Delta_r H^\circ = +890.3 \text{ kJ mol}^{-1}$

Based on the above thermochemical equations, the value of $\Delta_r H^\circ$ at 298 K for the reaction
$C_{(graphite)} + 2H_2(g) \rightarrow CH_4(g)$ will be :

(A) $-74.8 \text{ kJ mol}^{-1}$

(B) $-144.0 \text{ kJ mol}^{-1}$

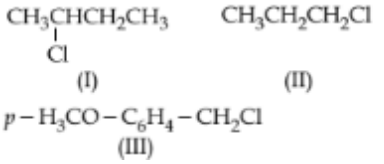
(C) 74.8 KJ mol^{-1}

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(D) 144.0 KJ mol^{-1}

Q.No. 53 The increasing order of the reactivity of the following halides for the S_N1 reaction is :



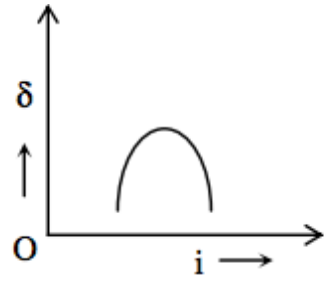
(A) (I) < (III) < (II)

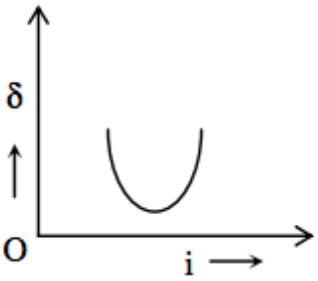
(B) (II) < (III) < (I)

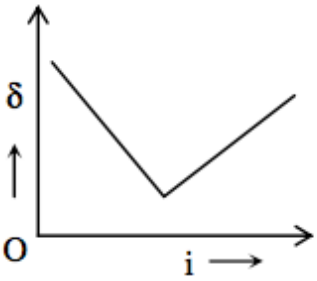
(C) (III) < (II) < (I)

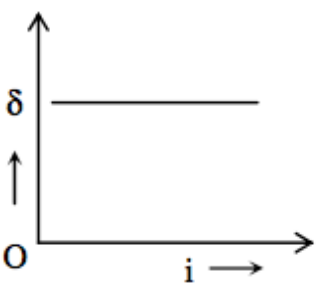
(D) (II) < (I) < (III)

Q.No. 54 The graph between angle of deviation (δ) and angle of incidence (i) for a triangular prism is represented by:

(A)


(B)


(C)


(D)


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Q.No. 55 The following results were obtained during kinetic studies of the reaction 2A+B Products

Experiment	[A] (in mol L^{-1})	[B] (in mol L^{-1})	Initial Rate of reaction (in mol L^{-1} min^{-1})
I	0.10	0.20	6.93×10^{-3}
II	0.10	0.25	6.93×10^{-3}
III	0.20	0.30	1.386×10^{-2}

The time (in minutes) required to consume half of A is:

(A) 5

(B) 1

(C) 10

(D) 100

Q.No. 56 A copper wire is stretched to make it 0.5% longer. The percentage change in its electrical resistance if its volume remains unchanged is :

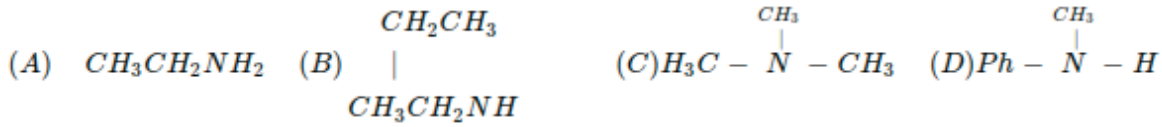
(A) 2.0 %

(B) 1.0 %

(C) 0.5 %

(D) 2.5 %

Q.No. 57 The increasing basicity order of the following compounds is :



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

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

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

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

Q.No. 58 At a given instant, say t=0, two radioactives substances A and B have equal activities. The ratio $\frac{R_B}{R_A}$ of their activities after time t itself decays with time t as e^{-3t}. If the half-life of A is In2, the half-life of B is:

(A) ln2/4

(B) In2/2

(C) 4ln2

(D) 2ln2

Q.No. 59 Consider three boxes, each containing 10 balls labelled 1, 2, ..., 10. Suppose one ball is randomly drawn from each of the boxes. Denote by $\mathbf{n}_i$ the label of the ball drawn from the ith box, (i=1, 2, 3). Then, the number of ways in which the balls can be chosen such that $n_1 < n_2 < n_3$ is:

(A) 120

(B) 164

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(C) 240

(D) 82

Q.No. 60 The recommended concentration of fluoride ion in drinking water is up to 1 ppm as fluoride ion is required to make teeth enamel harder by converting [$3Ca_3(PO_4)_2.Ca(OH)_2$] to :

(A) [CaF_2]

(B) [$3(CaF_2).Ca(OH)_2$]

(C) [$3Ca_3(PO_4)_2.CaF_2$]

(D) [$3\{Ca(OH)_2\}.CaF_2$]

Q.No. 61 If $\int f(x)\,dx = \Psi(x)$, then $\int x^5 f(x^3)\,dx$ is equal to

(A) $(1/3)x^3\Psi(x^3) - 3\int x^3\Psi(x^3)\,dx + C$

(B) $(1/3)x^3\Psi(x^3) - \int x^2\Psi(x^3)\,dx + C$

(C) $(1/3)[x^3\Psi(x^3) - \int x^3\Psi(x^3)\,dx] + C$

(D) $(1/3)[x^3\Psi(x^3) - \int x^2\Psi(x^3)\,dx\,] + C$

Q.No. 62 The anodic half-cell of lead-acid battery is recharged using electricity of 0.05 Faraday. The amount of $PbSO_4$ electrolyzed in g during the process is : (Molar mass of $PbSO_4$ =303 g mol^{-1})

(A) 15.2

(B) 11.4

(C) 7.6

(D) 22.8

Q.No. 63 $\lim\limits_{x\to\frac{\pi}{2}} \dfrac{\cot x - \cos x}{(\pi - 2x)^3}$ **equals :**

(A) 1/16

(B) 1/8

(C) 1/4

(D) 1/24

Q.No. 64 Chlorine on reaction with hot and concentrated sodium hydroxide gives :

(A) Cl^- and ClO_3^-

(B) Cl^- and ClO_2^-

(C) G^- and ClO^-

(D) ClO_3- and ClO_2^-

Q.No. 65 At 100°C, copper (Cu) has FCC unit cell structure with cell edge length of x Å . What is the approximate density of Cu in $g\,(cm^{-3})$ at this temperature ? [Atomic Mass of Cu=63.55 u)

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(A) $\frac{205}{x^3}$

(B) $\frac{211}{x^3}$

(C) $\frac{105}{x^3}$

(D) $\frac{422}{x^3}$

Q.No. 66 A vertical closed cylinder is separated into two parts by a frictionless piston of mass m and of negligible thickness. The piston is free to move along the length of the cylinder. The length of the cylinder above the piston is , and that below the piston is ,, such that > . Each part of the cylinder contains n moles of an ideal gas at equal temperature T. If the piston is stationary, its mass, m, will be given by: (R is universal gas constant and g is the acceleration due to gravity)

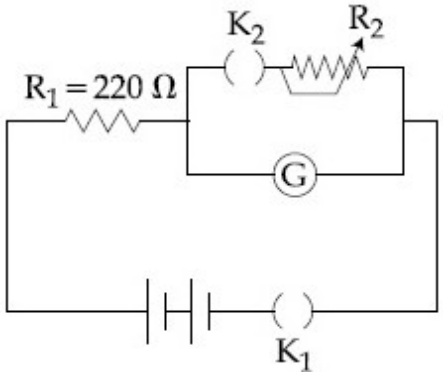
(A) $\frac{\mathrm{RT}}{\mathrm{ng}}\left[\frac{l_1-3l_2}{l_1l_2}\right]$

(B) $\frac{nRT}{g}\left[\frac{1}{l_2}+\frac{1}{l_1}\right]$

(C) $\frac{\mathrm{RT}}{\mathrm{g}}\left[\frac{2l_1+l_2}{l_1l_2}\right]$

(D) $\frac{\mathrm{nRT}}{g}\left[\frac{l_1-l_2}{l_1l_2}\right]$

Q.No. 67 The galvanometer deflection, when key K_1, is closed but K_2, is open, equals θ_0 (see figure). On closing K_2, also and adjusting R_2 to 5Ω, the deflection in galvanometer becomes $\frac{\theta_0}{5}$. The resistance of the



galvanometer is, then, given by [Neglect the internal resistance of battery]:

(A) 25Ω

(B) 22Ω

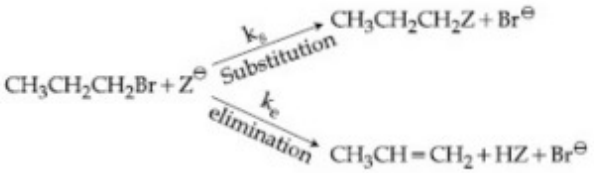
(C) 5Ω

(D) 12Ω

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For the following reactions



where,

$Z^{\ominus} = CH_3CH_2O^{\ominus}$ (A) or $H_3C-\overset{\overset{CH_3}{|}}{\underset{\underset{CH_3}{|}}{C}}-O^{\ominus}$ (B),

k_s and k_e, are, respectively, the rate constants for substitution and elimination,

and $\mu = \frac{k_s}{k_e}$, the correct option is

Q.No. 68 For the following reactions

(A) $\mu_B > \mu_A$ and $k_e(A) > k_e(B)$

(B) $\mu_A > \mu_B$ and $k_e(B) > k_e(A)$

(C) $\mu_B > \mu_A$ and $k_e(B) > k_e(A)$

(D) $\mu_A > \mu_B$ and $k_e(A) > k_e(B)$

Q.No. 69 The highest value of the calculated spin-only magnetic moment (in BM) among all the transition metal complexes is :

(A) 5.92

(B) 6.93

(C) 4.90

(D) 3.87

Q.No. 70 A mass of 10 kg is suspended by a rope of length 4 m. from the ceiling. A force F is applied horizontally at the midpoint of the rope such that the top half of the rope makes an angle of 45° with the vertical. Then F equals : (Take g = 10 ms^{-2} and the rope to be massless)

(A) 100 N

(B) 90 N

(C) 70 N

(D) 75 N

Q.No. 71 Let S be the set of all real values of such that a plane passing through the points $(-\lambda^2, 1, 1)$, $(1, -\lambda^2, 1)$ and $(1, 1, -\lambda^2)$ also passes through the point (-1,-1,1). Then S is equal to :

(A) {1, -1}

(B) {3, -3}

(C) {√3}

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(D) {√3, -√3}

Q.No. 72 A plano convex lens of refractive index μ_1 and focal length $f_1$is kept in contact with another plano concave lens of refractive index μ_2 and focal length f2. If the radius of curvature of their spherical faces is R each and $f_1 = 2f_2$, then μ_1 and μ_2 are related as :

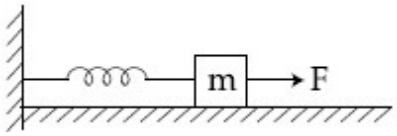
(A) $2\mu_2 - \mu_1 = 1$

(B) $3\mu_2 - 2\mu_1 = 1$

(C) $\mu_1 + \mu_2 = 3$

(D) $2\mu_1 - \mu_2 = 1$

Q.No. 73 A block of mass m, lying on a smooth horizontal surface, is attached to a spring (of negligible mass) of spring constant k. The other end of the spring is fixed, as shown in the figure. The block is initially at rest in its equilibrium position. If now the block is pulled with a constant force F, the maximum speed of the block is :



(A) $\frac{F}{\sqrt{mk}}$

(B) $\frac{F}{\pi\sqrt{mk}}$

(C) $\frac{\pi F}{\sqrt{mk}}$

(D) $\frac{2f}{\sqrt{mk}}$

Q.No. 74 If the third term in the binomial expansion of $(1+x^{\log_2 x})^5$ equals 2560, then a possible value of x is :

(A) $\frac{3}{2}\sqrt{21}$

(B) $\frac{2}{3}\sqrt{21}$

(C) 1/4

(D) $2\sqrt{21}$

Q.No. 75 The equation of the circle passing through the foci of the ellipse $x^2/16 + y^2/9 = 1$, and having centre at (0, 3) is

(A) $x^2 + y^2 - 6y + 7 = 0$

(B) $x^2 + y^2 - 6y - 5 = 0$

(C) $x^2 + y^2 - 6y + 5 = 0$

(D) $x^2 + y^2 - 6y - 7 = 0$

Q.No. 76 The top of a water tank is open to air and its water level is maintained. It is giving out 0.74 m water per minute through a circular opening of 2 cm radius in its wall. The depth of the centre of the opening from the level of water in the tank is close to :

(A) 9.6 m

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(B) 6.0 m

(C) 2.9 m

(D) 4.8 m

Q.No. 77 A circular loop of radius 0.3 cm lies parallel to a much bigger circular loop of radius 20 cm. The centre of the small loop is on the axis of the bigger loop. The distance between their centres is 15 cm. If a current of 2.0 A flows through the smaller loop, then the flux linked with bigger loop is

(A) 6×10^{-11} weber

(B) 3.3×10^{-11} weber

(C) 6×10^{-9} weber

(D) 9.1×10^{-11} weber

Q.No. 78 A water sample has ppm level concentration of the following metals : Fe=0.2; Mn=5.0; Cu=3.0; Zn=5.0. The metal that makes the water sample unsuitable for drinking is :

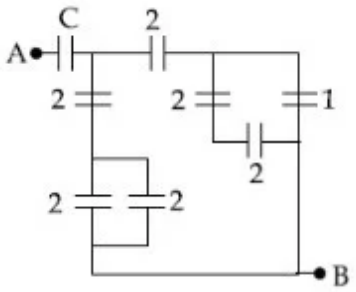
(A) Mn

(B) Zn

(C) Cu

(D) Fe

Q.No. 79 In the circuit shown, find C if the effective capacitance of the whole circuit is to be 0.5 uF. All



values in the circuit are in uF.

(A) $\frac{6}{5}\mu F$

(B) 4 μF

(C) $\frac{7}{11}\mu F$

(D) $\frac{7}{10}\mu F$

Q.No. 80 A rod, of length L at room temperature and uniform area of cross section A, is made of a metal having coefficient of linear expansion $\propto$/°C. It is observed that an external compressive force F, is applied on each of its ends, prevents any change in the length of the rod, when its temperature rises by ΔTK. Young's modulus, Y, for this metal is :

(A) $\frac{2F}{A\alpha\Delta T}$

(B) $\frac{F}{A\alpha\Delta T}$

(C) $\frac{F}{2A\alpha\Delta T}$

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(D) $\frac{F}{A\alpha(\Delta T-273)}$

Q.No. 81 Experimentally it was found that a metal oxide has formula $M_{0.98}O$. Metal M, is present as M^{2+} and M^{3+} in its oxide. Fraction of the metal which exists as M^{3+} would be:

(A) 4.08%

(B) 6.05%

(C) 5.08%

(D) 7.01%

Q.No. 82 The magnetic field associated with a light wave is given, at the origin, by B=B_o [sin(3.14x 10^7)ct + sin(6.28 x 10^7)ct]. If this light falls on a silver plate having a work function of 4.7 eV, what will be the maximum kinetic energy of the photo electrons ? $\left(c = 3 \times 10^8 ms^{-1}, h = 6.6 \times 10^{-34} J_{-S}\right)$

(A) 5 eV

(B) 8.52 eV

(C) 6.82 eV

(D) 7.72 eV

Q.No. 83 All x satisfying the inequality $\left(\cot^{-1} x\right)^2 - 7\left(\cot^{-1} x\right) + 10 > 0$, lie in the interval :

(A) $(-\infty, \cot 5) \cup (\cot 4, \cot 2)$

(B) $(\cot 2, \infty)$

(C) $(-\infty, \cot 5) \cup (\cot 2, \infty)$

(D) $(\cot 5, \cot 4)$

Q.No. 84 The major product of following reaction is :

$$R-C\equiv N \xrightarrow[(2)\ H_2O]{(1)\ AlH(i\text{-}Bu)_2} ?$$

(A) RCOOH

(B) RCHO

(C) $RCONH_2$

(D) RCH_2NH_2

Q.No. 85 Two lines $\frac{x-3}{1} = \frac{y+1}{3} = \frac{z-6}{-1}$ and $\frac{x+5}{7} = \frac{y-2}{-6} = \frac{z-3}{4}$ intersect at the point R. The reflection of R in the xy-plane has coordinates :

(A) (2, -4,7)

(B) (-2,4,7)

(C) (2,4,7)

(D) (2, -4, -7)

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Q.No. 86 The reaction, MgO(s) +C(s) >Mg(s) +CO(g), for which $\Delta_r H^\circ = +491.1 \quad kJ \quad mol^{-1}$ and $\Delta_r S^\circ = 198.0 JK^{-1} mol^{-1}$, is not feasible at 298 K. Temperature above which reaction will be feasible is :

(A) 2380.5 K

(B) 2480.3 K

(C) 2040.5 K

(D) 1890.0 K

Q.No. 87 A 100 V carrier wave is made to vary between 160 V and 40 V by a modulating signal. What is the modulation index?

(A) 0.4

(B) 0.5

(C) 0.6

(D) 0.3

Q.No. 88 The equation of the plane containing the straight line $\frac{x}{2} = \frac{y}{3} = \frac{z}{4}$ and perpendicular to the plane containing the straight lines $\frac{x}{3} = \frac{y}{4} = \frac{z}{2}$ and $\frac{x}{4} = \frac{y}{2} = \frac{z}{3}$ is :

(A) x+2y – 2z=0

(B) x-2y+z=0

(C) 3x +2y-3z=0

(D) 5x +2y - 4z=0

Q.No. 89 For reaction $2H_2(g) + 2NO(g) \rightarrow N_2(g) + 2H_2O(g)$ the Observed rate expression is, rate = $k_f[NO]^2[H_2]$. The rate expression for the reverse reaction is :

(A) $K_b[N_2][H_2O]^2$

(B) $K_b[N_2][H_2O]^2/[NO]$

(C) $K_b[N_2][H_2O]$

(D) $K_b[N_2][H_2O]^2/[H_2]$

Q.No. 90 Homoleptic octahedral complexes of a metal ion $'M^{3+1}$ with three monodentate ligands $L_1, L_2$and L_3 absorb wavelengths in the region of green, blue and red respectively. The increasing order of the ligand strength is :

(A) $L_3 < L_1 < L_2$

(B) $L_1 < L_2 < L_3$

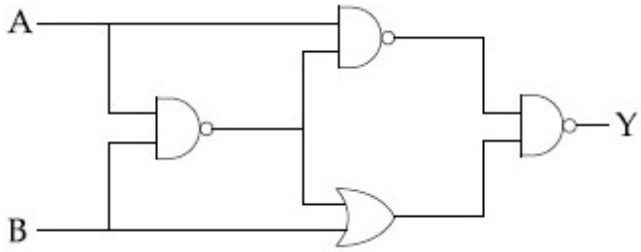
(C) $L_2 < L_1 < L_3$

(D) $L_3 < L_2 < L_1$

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Q.No. 91 The output of the given logic circuit is :



(A) $\overline{AB}$

(B) $A\overline{B}$

(C) $AB + \overline{AB}$

(D) $A\overline{B} + \overline{A}B$

Q.No. 92 A telephonic communication service is working at carrier frequency of 10 GHz. Only 10% of it is utilized for transmission. How many telephonic channels can be transmitted simultaneously if each channel requires a bandwidth of 5 kHz ?

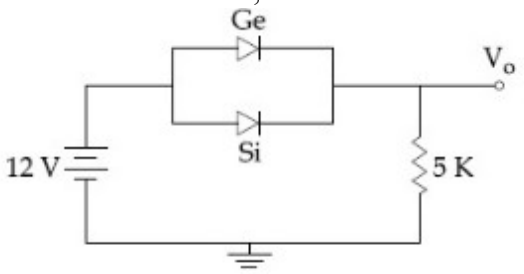
(A) 2×10^3

(B) 2×10^4

(C) 2×10^5

(D) 2×10^6

Q.No. 93 Ge and Si diodes start conducting at 0.3 V and 0.7 V respectively. In the following figure if Ge diode connection are reversed, the value of V_o changes by : (assume that the Ge diode has large breakdown voltage)



(A) 0.4 V

(B) 0.2 V

(C) 0.6 V

(D) 0.8 V

Q.No. 94 Let $a_1, a_2, a_3, \ldots, a_{49}$ be in A.P. such that $\sum_{k=0}^{12} a_{4k+1} = 416$ and $a_9 + a_{43} = 66$. If $a_1^2 + a_2^2 + \ldots + a_{17}^2 = 140\,m$, then m is equal to :

(A) 66

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(B) 68

(C) 34

(D) 33

Q.No. 95 An unbiased coin is tossed. If the outcome is a head then a pair of unbiased dice is rolled and the sum of the numbers obtained on them is noted. If the toss of the coin results in tail then a card from a well-shuffled pack of nine cards numbered 1, 2, 3, ..., 9 is randomly picked and the number on the card is noted. The probability that the noted number is either 7 or 8 is :

(A) 19/72

(B) 19/36

(C) 15/72

(D) 13/36

Q.No. 96 A metal ball of mass 0.1 kg is heated upto 500°C and dropped into a vessel of heat capacity $800JK^{-1}$ and containing 0.5 kg water. The initial temperature of water and vessel is 30°C. What is the approximate percentage increment in the temperature of the water ? [Specific Heat Capacities of water and metal are, respectively, $4200Jkg^{-1}K^{-1}$ and $400Jkg^{-1}K^{-1}$J Jkg-IK-1]

(A) 30%

(B) 20 %

(C) 25 %

(D) 15%

Q.No. 97 If $\mathrm{Re}\left(\frac{z-1}{2z+i}\right) = 1$ where z = x+iy, then the point (x,y) lies on a:

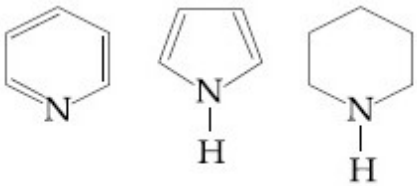
(A) circle whose centre is (-½, -3/2)

(B) straight line whose slope is -(⅔)

(C) straight line whose slope is is 3/2

(D) circle whose diameter is √5/ 2

Q.No. 98 Arrange the following amines in the decreasing order of basicity :



I II III

(A) 1 > III > II

(B) III > II > I

(C) III > I > II

(D) I > II > III

Q.No. 99 The equation of the line passing through (-4, 3, 1), parallel to the plane x+2y-z-5=0 and intersecting the line $\frac{x+1}{-3} = \frac{y-3}{2} = \frac{z-2}{-1}$ is

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(A) $\frac{x+4}{-1} = \frac{y-3}{1} = \frac{z-1}{1}$

(B) $\frac{x+4}{3} = \frac{y-3}{-1} = \frac{z-1}{1}$

(C) $\frac{x-4}{3} = \frac{y-3}{-1} = \frac{z-1}{1}$

(D) $\frac{x+4}{1} = \frac{y-3}{1} = \frac{z-1}{3}$

Q.No. 100 The following observations were taken for determining surface tension T of water by capillary method : diameter of capillary, D=1.25×10^{-2} m rise of water, h=1.45×10^{-2}m. Using g=9.80 m/s^2 and the simplified relation T = rhg/2 *10^3 N/m, the possible error in surface tension is closest to :

(A) 0.15%

(B) 1.5%

(C) 2.4%

(D) 10%

Q.No. 101 The dimension of $\frac{B^2}{2\mu_0}$, where B is magnetic field and μ_0 is the magnetic permeability of vacuum, is

(A) MLT^{-2}

(B) MLT^2T^{-1}

(C) ML^2T^{-2}

(D) $ML^{-1}T^{-2}$

Q.No. 102 An electron, a proton and an alpha particle having the same kinetic energy are moving in circular orbits of radii r_e, r_p, r_α respectively in a uniform magnetic field B. The relation between r_e, r_p, r_α is :

(A) $r_e > r_p = r_\alpha$

(B) $r_e < r_p = r_\alpha$

(C) $r_e < r_p < r_\alpha$

(D) $r_e < r_\alpha < r_p$

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	Item I		Item II
(A)	Allosteric effect	(P)	Molecule binding to the active site of enzyme
(B)	Competitive inhibitor	(Q)	Molecule crucial for communication in the body
(C)	Receptor	(R)	Molecule binding to a site other than the active site of enzyme
(D)	Poison	(S)	Molecule binding to the enzyme covalently

Q.No. 103 The correct match between Item I and Item II is :

(A) $(A) \rightarrow (P); (B) \rightarrow (R); (C) \rightarrow (D); (D) \rightarrow (Q)$

(B) $(A) \rightarrow (R); (B) \rightarrow (P); (C) \rightarrow (Q); (D) \rightarrow (S)$

(C) $(A) \rightarrow (P); (B) \rightarrow (R); (C) \rightarrow (Q); (D) \rightarrow (S)$

(D) $(A) \rightarrow (R); (B) \rightarrow (P); (C) \rightarrow (S); (D) \rightarrow (Q)$

Q.No. 104 The distance of the point (1, 3, −7) from the plane passing through the point (1, −1, −1), having normal perpendicular to both the lines (x-1)/1= (y+2)/-2= (x-4)/3 and (x-2)/2= (y+1)/-1= (z+7)/-1, is:

(A) 10/√83

(B) 5/√83

(C) 10/√74

(D) 20/√74

Q.No. 105 In a collinear collision, a particle with an initial speed v_o strikes a stationary particle of the same mass. If the final total kinetic energy is 50% greater than the original kinetic energy, the magnitude of the relative velocity between the two particles, after collision, is :

(A) $v_o/4$

(B) $\sqrt{2}v_o$

(C) $v_o/2$

(D) $v_o/\sqrt{2}$

Q.No. 106 A man grows into a giant such that his linear dimensions increase by a factor of 9. Assuming that his density remains same, the stress in the leg will change by a factor of:

(A) 9

(B) 1/9

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(C) 81

(D) 1/81

Q.No. 107 The magnetic field in a travelling electromagnetic wave has a peak value of 20 nT. The peak value of electric field strength is :

(A) 6 V/m

(B) 9 V/m

(C) 12 V/m

(D) 3 V/m

Q.No. 108 The moment of inertia of a uniform cylinder of length *l* and radius *R* about its perpendicular bisector is I. What is the ratio *l/R* such that the moment of inertia is minimum?

(A) $\sqrt{\frac{3}{2}}$

(B) $\sqrt{3}/2$

(C) 1

(D) $3/\sqrt{2}$

Q.No. 109 The compound that does not produce nitrogen gas by the thermal decomposition is :

(A) $Ba(N_3)_2$

(B) $(NH_4)_2Cr_2O_7$

(C) NH_4NO_2

(D) $(NH_4)_2SO_4$

Q.No. 110 8 g of NaOH is dissolved in 18 g of H_2O. Mole fraction of NaOH in solution and molality (in mol kg^{-1}) of the solution respectively are :

(A) 0.167, 22.20

(B) 0.167, 11.11

(C) 0.2, 22.20

(D) 0.2, 11.11

Q.No. 111 Both lithium and magnesium display several similar properties due to the diagonal relationship; however, the one which is incorrect, is :

(A) both form nitrides

(B) nitrates of both Li and Mg yield NO_2 and O_2 on heating

(C) both form basic carbonates

(D) both form soluble bicarbonates

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Q.No. 112 If $\begin{vmatrix} a-b-c & 2a & 2a \\ 2b & b-c-a & 2b \\ 2c & 2c & c-a-b \end{vmatrix} = (a+b+c)(x+a+b+c)^2, \quad x \neq 0$ and $a+b+c \neq 0$, then x is equal to :

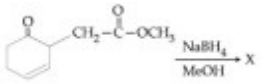
(A) - (a+b+c)

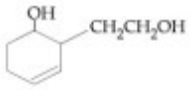
(B) abc

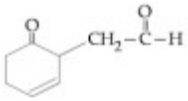
(C) 2(a+b+c)

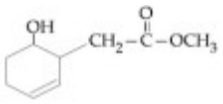
(D) -2(a+b+c)

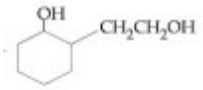
Q.No. 113 The major product 'X' formed in the following reaction is :



(A) 

(B) 

(C) 

(D) 

Q.No. 114 The least count of the main scale of a screw gauge is 1 mm. The minimum number of divisions on its circular scale required to measure 5μm diameter of a wire is :

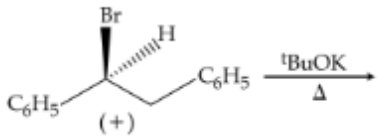
(A) 50

(B) 100

(C) 200

(D) 500

Q.No. 115 The major product obtained in the following reaction is :



(A) $(+)C_6H_5CH(O^tBu)CH_2C_6H_5$

(B) $(-)C_6H_5CH(O^tBu)CH_2C_6H_5$

(C) $(\pm)C_6H_5CH(O^tBu)CH_2C_6H_5$

(D) $C_6H_5CH=CHC_6H_5$

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Q.No. 116 In a hydrogen like atom, when an electron jumps from the M - shell to the L - shell, the wavelength of emitted radiation is λ. If an electron jumps from N-shell to the L-shell, the wavelength of emitted radiation will be:

(A) $\frac{16}{25}\lambda$

(B) $\frac{25}{16}\lambda$

(C) $\frac{20}{27}\lambda$

(D) $\frac{27}{20}\lambda$

Q.No. 117 A train moves towards a stationary observer with speed 34 m/s. The train sounds a whistle and its frequency registered by the observer is f_1 . If the speed of the train is reduced to 17 m/s, the frequency registered is f_2 . If speed of sound is 340 m/s, then the ratio f_1 / f_2 is :

(A) 20/19

(B) 18/17

(C) 19/18

(D) 21/20

Q.No. 118 A satellite of mass M is in a circular orbit of radius R about the centre of the earth. A meteorite of the same mass, falling towards the earth, collides with the satellite completely inelastically. The speeds of the satellite and the meteorite are the same, just before the collision. The subsequent motion of the combined body will be:

(A) in an elliptical orbit

(B) in the same circular orbit of radius R

(C) in a circular orbit of a different radius

(D) such that it escapes to infinity

Q.No. 119 Given: (i) $\mathrm{C\ (graphite)\ + O_2}(g) \rightarrow \mathrm{CO_2}(g)$: $\Delta \mathrm{rH}^\circ = x\mathrm{k}]\mathrm{mol}^{-1}$ (ii) $\mathrm{C\ (graphite)\ + \frac{1}{2}O_2}(g) \rightarrow \mathrm{CO_2}(g)$: $\Delta \mathrm{rH}^\circ = y\mathrm{k}]\mathrm{mol}^{-1}$ (iii) $\mathrm{CO}(g) + \frac{1}{2}\mathrm{O_2}(g) \rightarrow \mathrm{CO_2}(g)$ $\Delta \mathrm{rH}^\circ = z\mathrm{k}]\mathrm{mol}^{-1}$ Based on the above thermochemical equations, find out which one of the following algebraic relationships is correct?

(A) z = x + y

(B) x = y - z

(C) r = y + z

(D) y = 2z - x

Q.No. 120 If a variable line, 3x+4y-λ=0 is such that the two circles $x^2 + y^2 - 2x - 2y + 1=0$ and $x^2 + y^2 – 18x – 2y + 78 = 0$ are on its opposite sides, then the set of all values of λ is the interval :

(A) (23, 31)

(B) (2,17)

(C) [13, 23]

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(D) [12, 21]

Answer Sheet

Q.No	Answer
Q.No. 1	(D)
Q.No. 2	(A)
Q.No. 3	(D)
Q.No. 4	(D)
Q.No. 5	(D)
Q.No. 6	(B)
Q.No. 7	(C)
Q.No. 8	(A)
Q.No. 9	(B)
Q.No. 10	(A)
Q.No. 11	(C)
Q.No. 12	(C)
Q.No. 13	(B)
Q.No. 14	(B)
Q.No. 15	(B)
Q.No. 16	(B)
Q.No. 17	(C)
Q.No. 18	(A)
Q.No. 19	(B)
Q.No. 20	(D)
Q.No. 21	(C)
Q.No. 22	(B)
Q.No. 23	(D)
Q.No. 24	(D)
Q.No. 25	(B)
Q.No. 26	(D)
Q.No. 27	(D)
Q.No. 28	(A)
Q.No. 29	(C)
Q.No. 30	(D)
Q.No. 31	(B)
Q.No. 32	(C)
Q.No. 33	(D)
Q.No. 34	(A)

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Q.No. 35	(D)
Q.No. 36	(C)
Q.No. 37	(D)
Q.No. 38	(B)
Q.No. 39	(B)
Q.No. 40	(A)
Q.No. 41	(B)
Q.No. 42	(B)
Q.No. 43	(B)
Q.No. 44	(B)
Q.No. 45	(A)
Q.No. 46	(B)
Q.No. 47	(C)
Q.No. 48	(A)
Q.No. 49	(A)
Q.No. 50	(D)
Q.No. 51	(C)
Q.No. 52	(A)
Q.No. 53	(D)
Q.No. 54	(B)
Q.No. 55	(A)
Q.No. 56	(B)
Q.No. 57	(A)
Q.No. 58	(A)
Q.No. 59	(A)
Q.No. 60	(C)
Q.No. 61	(B)
Q.No. 62	(C)
Q.No. 63	(A)
Q.No. 64	(A)
Q.No. 65	(D)
Q.No. 66	(D)
Q.No. 67	(B)
Q.No. 68	(B)
Q.No. 69	(A)
Q.No. 70	(B)
Q.No. 71	(D)
Q.No. 72	(D)
Q.No. 73	(A)

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Q.No. 74	(C)
Q.No. 75	(D)
Q.No. 76	(D)
Q.No. 77	(D)
Q.No. 78	(A)
Q.No. 79	(C)
Q.No. 80	(B)
Q.No. 81	(D)
Q.No. 82	(D)
Q.No. 83	(B)
Q.No. 84	(B)
Q.No. 85	(D)
Q.No. 86	(B)
Q.No. 87	(C)
Q.No. 88	(B)
Q.No. 89	(D)
Q.No. 90	(A)
Q.No. 91	(B)
Q.No. 92	(C)
Q.No. 93	(A)
Q.No. 94	(C)
Q.No. 95	(B)
Q.No. 96	(B)
Q.No. 97	(D)
Q.No. 98	(C)
Q.No. 99	(B)
Q.No. 100	(B)
Q.No. 101	(D)
Q.No. 102	(B)
Q.No. 103	(B)
Q.No. 104	(A)
Q.No. 105	(B)
Q.No. 106	(A)
Q.No. 107	(A)
Q.No. 108	(A)
Q.No. 109	(D)
Q.No. 110	(B)
Q.No. 111	(C)
Q.No. 112	(D)

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Q.No. 113	(C)
Q.No. 114	(C)
Q.No. 115	(D)
Q.No. 116	(C)
Q.No. 117	(C)
Q.No. 118	(A)
Q.No. 119	(C)
Q.No. 120	(D)

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