

Title	Size	Time	Neg	Mode	Categories	Test Date	
Grand test-6	75	180	1	Manual	Physical World and Measurements Laws of Motion Work, Energy and Power System of Particles and Rotational Motion Thermodynamics Current Electricity Moving charges and magnetism Electromagnetic Induction Ray Optics and Optical Instruments Dual Nature of Matter and Radiation Atoms Electronic Devices States of Matter: Gases and Liquids Chemical Bonding and Molecular Structure Chemical Thermodynamics Solutions Equilibrium Chemical Kinetics p-BLOCK ELEMENTS GROUP 13(BORON FAMILY) Co-ordination Compounds Environmental Chemistry Organic Chemistry: Some basic Principles and Techniques Hydrocarbons Haloalkanes and Haloarenes Alcohols, Phenols and Ethers Bio Molecules Sets Complex Numbers and Quadratic Equations Matrices Permutations and Combinations Binomial Theorem Sequences and Series Limits and Derivatives Integrals Straight Lines Vectors Statistics Trigonometric Functions Mathematical Reasoning Application of Derivatives Motion in a Plane Mechanical Properties of Fluids Thermal Properties of Matter Electrostatic Potential and Capacitance Wave Optics Solid State Electrochemistry Aldehydes, Ketones and Carboxylic Acids Conic Sections Determinants Applications of the Integrals Three - dimensional Geometry P - Block Elements Probability Nuclei	2020-01-06 14:00:00	2020-01-06 17:00:00

S.No	Question
	<b>Mathematics</b>
1	The area bounded by the curve $y^2(a^2 + x^2) = x^2(a^2 - x^2)$ is _____ sq.units <b>A) <math>a^2(\pi - 2)</math> B) <math>a^2(\pi + 2)</math> C) <math>a^2(\pi - 1)</math> D) <math>a^2(\pi + 1)</math></b> <span style="float: right;">Applications of the Integrals</span>
2	A spherical rain drop evaporates at a rate proportional to its surface area at any instant. The differential equation giving the rate of change of the radius of the rain drop is <b>A) <math>\frac{d^2r}{dt^2} + 2r = 0</math> B) <math>\frac{d^2r}{dt^2} - 3r = 0</math> C) <math>\frac{d^2r}{dt^2} = 0</math> D) None of these</b> <span style="float: right;">Application of Derivatives</span>
3	If $M = \int_0^{\pi/2} \frac{\cos x}{x+2} dx$ and $N = \int_0^{\pi/4} \frac{\sin x \cos x}{(x+1)^2} dx$ then the value of M-N is

	A) $\frac{3}{\pi+2}$ B) $\frac{2}{\pi-4}$ C) $\frac{4}{\pi-2}$ D) $\frac{2}{\pi+4}$	Integrals
4	$\int \left( \frac{\sec^2 x - 7}{\sin^7 x} \right) dx$ is equal to	
	A) $\frac{\tan x}{\sin^7 x} + C$ B) $\frac{\cos x}{\sin^7 x} + C$ C) $\frac{\sin x}{\cos^7 x} + C$ D) $\frac{\sin x}{\tan^7 x} + C$	Integrals
5	The projection of a vector $\vec{a} = 4\hat{i} - 3\hat{j} + 2\hat{k}$ on the axes making equal acute angles with the coordinate axes is	
	A) 3 B) $\sqrt{3}$ C) $\frac{1}{\sqrt{3}}$ D) None of these	Vectors
6	If two lines $L_1 : x = 5, \frac{y}{3-\alpha} = \frac{z}{-2}$ and $L_2 : x = \alpha, \frac{y}{-1} = \frac{z}{2-\alpha}$ are coplanar, then $\alpha$ can take the value	
	A) 1 B) 2 C) 3 D) 14	Three - dimensional Geometry
7	The angle between the line $\frac{x+1}{3} = \frac{y-1}{4} = \frac{z-2}{2}$ and the plane $2x - 3y + z + 4 = 0$ is	
	A) $\cos^{-1} \left( \frac{-4}{\sqrt{406}} \right)$ B) $\sin^{-1} \left( \frac{4}{\sqrt{406}} \right)$ C) $\sin^{-1} \left( \frac{-4}{\sqrt{406}} \right)$ D) $\cos^{-1} \left( \frac{4}{\sqrt{406}} \right)$	Three - dimensional Geometry
8	If $f(x) = \frac{x^2 - x}{x^2 + 2x}, x \neq 0, -2$ , then $\frac{d}{dx}(f^{-1}(x))$ is equal to	
	A) $\frac{-1}{(1-x)^2}$ B) $\frac{3}{(1-x)^2}$ C) $\frac{1}{(1-x)^2}$ D) $\frac{-3}{(1-x)^2}$	Limits and Derivatives
9	A function $g(x)$ is defined as $g(x) = \frac{1}{4}f(2x^2 - 1) + \frac{1}{2}f(1 - x^2)$ and $f'(x)$ is increasing function, then $g(x)$ is increasing in the interval	
	A) $(-1, 1)$ B) $\left( -\sqrt{\frac{4}{3}}, \infty \right)$ C) $\left( -\sqrt{\frac{2}{3}}, 0 \right)$ D) None of these	Application of Derivatives
10	If $A = \begin{bmatrix} -1 & 1 \\ 0 & -2 \end{bmatrix} = B^3 + C^3$ , where B and C are $2 \times 2$ matrices with integer Elements, then trace B + trace C is equal to	

	<b>A) 3 B) -3 C) 2 D) -2</b>	<b>Matrices</b>
11	$\Delta = \begin{bmatrix} my + nz & mq + nr & mb + nc \\ kz - mx & kr - mp & kc - ma \\ -nx - ky & -np - kq & -na - kb \end{bmatrix}$ is equal to	
	<b>A) <math>\Delta = 0</math> B) <math>\Delta \neq 0</math> C) <math>\Delta = f(x, y, z)</math> D) None of these</b>	<b>Determinants</b>
12	A bag contains $n + 1$ coins. It is known that one of these coins shows heads on both sides, where as the other coins are fair one coin is selected at random and tossed. If the probability that toss results in heads is $\frac{7}{12}$ , then the value of $n$ is	
		<b>Probability</b>
13	The variance of first 50 even natural numbers is	
		<b>Statistics</b>
14	The contrapositive statement of the proposition $p \rightarrow \sim q$ is	
	<b>A) <math>\sim p \rightarrow q</math> B) <math>\sim q \rightarrow p</math> C) <math>q \rightarrow \sim p</math> D) None of these</b>	<b>Mathematical Reasoning</b>
15	$\lim_{x \rightarrow \frac{\pi}{2}} \frac{[1 - \tan(\frac{x}{2})](1 - \sin x)}{[1 + \tan(\frac{x}{2})](\pi - 2x)^3}$ is equal to	
	<b>A) <math>\frac{1}{8}</math> B) 0 C) <math>\frac{1}{32}</math> D) <math>\infty</math></b>	<b>Limits and Derivatives</b>
16	If two different tangents of $y^2 = 4x$ are the normal to $x^2 = 4by$ , then	
	<b>A) <math> b  &gt; \frac{1}{2\sqrt{2}}</math> B) <math> b  &lt; \frac{1}{2\sqrt{2}}</math> C) <math> b  &gt; \frac{1}{\sqrt{2}}</math> D) <math> b  &lt; \frac{1}{\sqrt{2}}</math></b>	<b>Conic Sections</b>
17	The shortest distance between the circles $(x - 1)^2 + (y + 2)^2 = 1$ and $(x + 2)^2 + (y - 2)^2 = 4$ is	
	<b>A) 1 B) 2 C) 3 D) 4</b>	<b>Conic Sections</b>
18	A straight line passes through a fixed point $(h, k)$ . Then the locus of the foot of the perpendicular on it from the origin is	
	<b>A) <math>x^2 + y^2 - hx - ky = 0</math> B) <math>x^2 - y^2 - hx + ky = 0</math> C) <math>x^2 - y^2 + hx + ky = 0</math> D) <math>x^2 + y^2 + hx + ky = 0</math></b>	<b>Straight Lines</b>

19	P is a point on the segment joining the feet of two vertical poles of height a and b. The angles of elevation of the tops of poles from P is 45 each. Then the square of the distance between the tops of the poles is	
	<b>A) <math>\frac{a^2 + b^2}{2}</math> B) <math>a^2 + b^2</math> C) <math>2(a^2 + b^2)</math> D) <math>4(a^2 + b^2)</math></b>	<b>Trigonometric Functions</b>
20	The coefficient of $x^5$ in $(1 + 2x + 3x^2 + \dots)^{-3/2}$ is	
		<b>Binomial Theorem</b>
21	The number of permutations of the letters of the word HINDUSTAN such that neither the pattern HIN nor 'DUS' nor 'TAN' appears is	
		<b>Permutations and Combinations</b>
22	A value of b for which the equations $x^2 + bx - 1 = 0$ , $x^2 + x + b = 0$ have one root in common is	
	<b>A) <math>-\sqrt{2}</math> B) <math>-i\sqrt{3}</math> C) <math>i\sqrt{5}</math> D) <math>\sqrt{2}</math></b>	<b>Complex Numbers and Quadratic Equations</b>
23	Let $z_1$ and $z_2$ be two complex numbers represented by points on the circle $ z  = 1$ and $ z  = 2$ respectively then	
	<b>A) <math>\max  2z_1 + z_2  = 3</math> B) <math>\min  z_1 - z_2  = 0</math> C) <math> z_2 + \frac{1}{z_1}  \leq 3</math> D) None of these</b>	<b>Complex Numbers and Quadratic Equations</b>
24	The value of n for which $704 + \frac{1}{2}(704) + \frac{1}{4}(704) + \dots n \text{ terms} = 1984 - \frac{1}{2}(1984) + \frac{1}{4}(1984) + \dots (n \text{ terms})$ is	
		<b>Sequences and Series</b>
25	If $n(A) = 1000$ , $n(B) = 500$ and $n(A \cap B) \geq 1$ and $n(A \cup B) = P$ , then	
	<b>A) <math>500 \leq P \leq 1000</math> B) <math>1001 \leq P \leq 1498</math> C) <math>1000 \leq P \leq 1499</math> D) <math>999 \leq P \leq 1499</math></b>	<b>Sets</b>

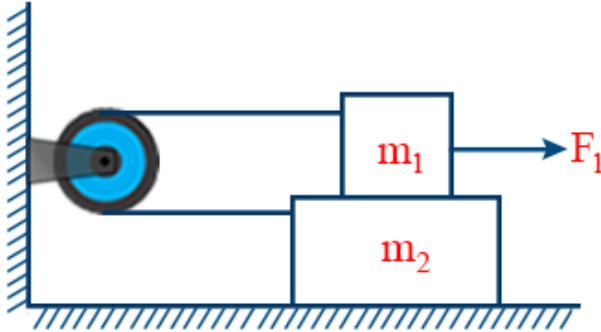
Physics

26	In the expression $p = \frac{a^2}{b} e^{-ax}$ p is pressure, x is a distance and a, b are constant. The dimensional formula for "b" is	
	<b>A) <math>M L^{-1} T^{-2}</math> B) <math>M^{-1} L^{-1} T^{-2}</math> C) <math>M^{-1} L^1 T^{-2}</math> D) <math>M^{-1} L^{-1} T^2</math></b>	<b>Physical World and Measurements</b>
27	A body is projected horizontally with a speed "u" from the top of "A" of plane ABC inclined at an angle ' $\theta$ ' = $30^\circ$ with the horizontal. It strikes the plane at point "P". The distance "AP" is given by	

- A)  $\frac{u^2}{2g}$  B)  $\frac{3u^2}{2g}$  C)  $\frac{2u^2}{3g}$  D)  $\frac{4u^2}{3g}$

Motion in a Plane

- 28 Two blocks of masses  $m_1 = 100 \text{ gr}$  and  $m_2 = 5 \text{ kg}$  as shown. The coefficient of static friction between  $m_2$  and  $m_1$  is 0.5. There is no friction between  $m_2$  and the horizontal surface. The maximum horizontal force "F" that can be applied on "m<sub>1</sub>" So that it does not slide on "m<sub>2</sub>" is



- A) 1 N B) 2 N C) 3 N D) 4 N

Laws of Motion

- 29 A constant power "P" is supplied to a car of mass 3000 kg. The velocity of the car increases from 2 m/s to 5 m/s. The Power "P" such that car travels a distance 117 m is

- A) 3 KW B) 2 KW C) 4 KW D) 1 KW

Work, Energy and Power

- 30 A ball of mass 2 kg moving with a velocity of 8 m/s collides head on with another ball of mass 4 kg moving with velocity of 2 m/s moving in the same direction. The collision is elastic and the coefficient of restitution is 0.5. Then the loss in kinetic energy due to collision is \_\_\_\_\_ J

Work, Energy and Power

- 31 A Non uniform rod of (AB) length 50 cm has a linear density  $\lambda = 4x + 5$  where  $\lambda$  is in kg/m and "x" is in met. The distance of centre of mass of the bar from its midpoint is

- A) 1.4 cm B) 2.6 cm C) 3 cm D) 3.8 cm

System of Particles and Rotational Motion

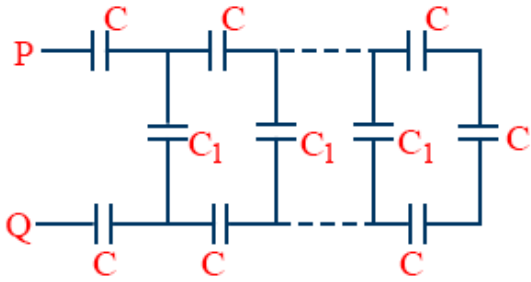
- 32 The work done to split a spherical drop of mercury of diameter 1 cm in to "8" identical drops. The surface tension of mercury 0.035 N/m

- A)  $1.9 \times 10^{-4} \text{ J}$  B)  $1.1 \times 10^{-4} \text{ J}$  C)  $1.9 \times 10^{-5} \text{ J}$  D)  $1.1 \times 10^{-5} \text{ J}$

Mechanical Properties of Fluids

- 33 A Liquid is contained in a rectangular vessel fastened on a cart. A constant force is applied to the cart. As a result the level becomes inclined at an angle of  $30^\circ$  with the horizontal the acceleration produced by the force is \_\_\_\_\_  $\text{m/s}^2$

Mechanical Properties of Fluids

34	<p>The coefficient of volume expansion of a liquid is <math>5 \times 10^{-4} \text{ K}^{-1}</math>. If the temperature is increased by <math>30^\circ\text{C}</math>. The percentage change in its density is</p> <p><b>A) 1% B) 1.5 % C) 2 % D) 2.5 %</b></p> <p style="text-align: right;"><b>Thermal Properties of Matter</b></p>
35	<p>A cylindrical metal boiler of radius 10 cm and thickness 3.14 cm is filled with water and placed on an electric heater. If the water boils at the rate of 50 g/sec, the temperature of the filament. Thermal conductivity of metal is <math>1.13 \times 10^2 \text{ W/mK}</math> and latent heat of vaporization <math>2.26 \times 10^3 \text{ J/gr}</math>.</p> <p><b>A) <math>1000^\circ\text{C}</math> B) <math>1100^\circ\text{C}</math> C) <math>1200^\circ\text{C}</math> D) <math>1400^\circ\text{C}</math></b></p> <p style="text-align: right;"><b>Thermal Properties of Matter</b></p>
36	<p>5 moles of an ideal diatomic gas (<math>\gamma = 1.4</math>) are heated at a constant pressure. If 280 J of heat energy is supplied to the gas the work done by the gas is _____ J</p> <p style="text-align: right;"><b>Thermodynamics</b></p>
37	<p>When the plates of a parallel plate capacitor of capacitance <math>3 \mu\text{F}</math> are connected by a wire of resistance "R". The electric field between the plates drops to half of its initial value in <math>6.9 \mu\text{s}</math>. The value of "R" is</p> <p><b>A) <math>\frac{3}{5} \Omega</math> B) <math>\frac{9}{5} \Omega</math> C) <math>\frac{10}{3} \Omega</math> D) <math>\frac{12}{5} \Omega</math></b></p> <p style="text-align: right;"><b>Electrostatic Potential and Capacitance</b></p>
38	<p>In the network as shown <math>C_1 = 6 \mu\text{F}</math> and <math>C = 9 \mu\text{F}</math>. The equivalent capacitance between points P &amp; Q is</p>  <p><b>A) <math>3 \mu\text{F}</math> B) <math>6 \mu\text{F}</math> C) <math>9 \mu\text{F}</math> D) <math>12 \mu\text{F}</math></b></p> <p style="text-align: right;"><b>Electrostatic Potential and Capacitance</b></p>
39	<p>Which of the following resistance will have the highest rate of dissipation of heat.</p> <p><b>A) <math>3 \Omega</math> B) <math>6 \Omega</math> C) <math>9 \Omega</math> D) <math>12 \Omega</math></b></p> <p style="text-align: right;"><b>Current Electricity</b></p>
40	<p>In the potentiometer circuit the internal resistance of the 6 V battery (Primary circuit) is <math>1 \Omega</math> and the length of the wire is 100 cm when balancing point is 60 cm. The emf of the cell C in the secondary circuit is (Given resistance of the potentiometer wire is <math>2 \Omega</math>).</p> <p><b>A) 0.7 V B) 0.8 V C) 0.9 V D) 1.0 V</b></p> <p style="text-align: right;"><b>Current Electricity</b></p>



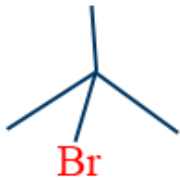
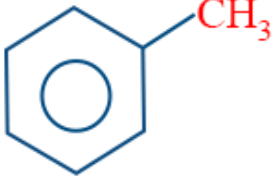
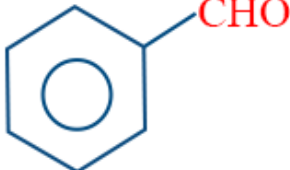
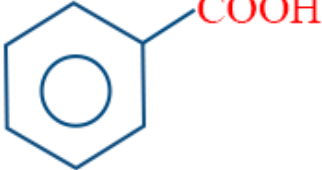

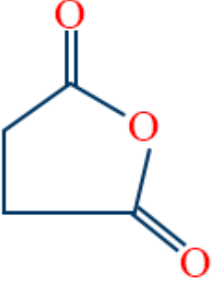
41	The battery of a car is connected to the motor by 50 cm long wires which are 1 cm apart. If the current in the wires is 200 A. The force between the wire is.	
	<b>A) 0.2 N B) 0.4 N C) 0.8 N D) 1.2 N</b>	<b>Moving charges and magnetism</b>
42	A metal wire of mass "m" slides with out friction on two rails spaced at a distance 'd' apart. The track lies in a vertical uniform magnetic field "B". A constant current "I" flows along one rail, across the wire and back down the other rail. If the wire is initially at rest the time taken by it to move through a distance "x" along the track is	
	<b>A) <math>t = \sqrt{\frac{BI d}{2xm}}</math> B) <math>t = \sqrt{\frac{2xm}{BI d}}</math> C) <math>t = \sqrt{\frac{BI dm}{2x}}</math> D) <math>t = \sqrt{\frac{2dm}{BI x}}</math></b>	<b>Moving charges and magnetism</b>
43	A square coil of resistance 2 $\Omega$ , 100 turns and side 10 cm is placed with its plane making an angle of 30° with a uniform magnetic field of 0.1 T. In 0.05 sec the coil rotates until its plane becomes parallel to the magnetic field. The current induced in the coil.	
	<b>A) 0.5 A B) 1 A C) 1.5 A D) 2 A</b>	<b>Electromagnetic Induction</b>
44	A driver stops his car at a red light. The car fitted with side view mirror of focal length 10 m. An ambulance is approaching the car at a constant speed of 16 m/s. The speed of image of the ambulance, as seen by the driver in the side view mirror when it is at a distance of 50 m from the mirror will be	
	<b>A) 1 m/s B) <math>\frac{4}{9}</math> m/s C) <math>\frac{2}{3}</math> m/s D) 2 m/s</b>	<b>Ray Optics and Optical Instruments</b>
45	The magnifying power of a compound microscope whose objective and eyepiece are of focal length 4 cm and 6 cm respectively and the object is placed 5 cm beyond the objective. Assume that the final image is formed at the least distance of distinct vision (25 cm)	
	<b>A) -20.7 B) -10.3 C) -41.4 D) -30.4</b>	<b>Ray Optics and Optical Instruments</b>
46	Monochromatic light of wavelength 500 nm is used in young's double slit experiment. One of the slits is covered by a glass sheet of thickness $2 \times 10^{-2}$ mm and refractive index 1.5. The number of fringes shifted by the introduction of the sheet is ____.	
		<b>Wave Optics</b>
47	The stopping potential of a metal is 3V when it is illuminated by light of wavelength 500 nm. Then the stopping potential of the metal when the wave length is 600 nm is (in volts)_____.	
		<b>Dual Nature of Matter and Radiation</b>
48	The ratio of longest wavelength to shortest wave length in the Lyman series of hydrogen atom.	

	A) $\frac{5}{3}$ B) $\frac{3}{4}$ C) $\frac{4}{3}$ D) $\frac{3}{5}$	Atoms
49	The fission properties of ${}_{94}^{239}\text{Pu}$ are very similar to those of ${}_{92}^{235}\text{U}$ . The average energy released per fission is 180 MeV. How much energy in MeV, is released if all the atoms in 1 kg of pure ${}_{94}^{239}\text{Pu}$ undergo fission?	
	A) $2.514 \times 10^{36}$ MeV B) $4.536 \times 10^{36}$ MeV C) $2.429 \times 10^{30}$ D) $6.429 \times 10^{36}$ MeV	Nuclei
50	The voltage gain in a transistor connected in common emitter mode output resistance 4 K $\Omega$ and input resistance 1 K $\Omega$ , collector current 1 mA and base current 20 $\mu\text{A}$ is	
	A) 50 B) 100 C) 200 D) 400	Electronic Devices

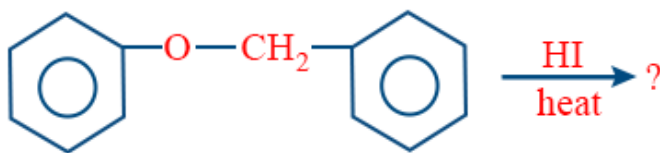
## Chemistry

51	The free energy of formation of 'NO' is 78 KJ/mole at the temperature of an auto mobile engine (1000k). Then the Kc for this reaction at 1000K is _____ $\times 10^{-5}$ . $\frac{1}{2}\text{N}_{2(g)} + \frac{1}{2}\text{O}_{2(g)} \rightleftharpoons \text{NO}_{(g)}$	Equilibrium
52	For the reaction $2\text{A} + \text{C} \rightarrow \text{B} + 3\text{D}$ , the differential law can be written as A) $\frac{1}{2} \frac{d[\text{A}]}{dt} = \frac{-d[\text{B}]}{dt} = K[\text{A}]^x[\text{B}]^y$ B) $\frac{-d[\text{A}]}{dt} = \frac{1}{3} \frac{d[\text{D}]}{dt} = K[\text{A}]^x[\text{D}]^y$ C) $-\frac{1}{2} \frac{d[\text{A}]}{dt} = \frac{-d[\text{C}]}{dt} = K[\text{A}]^x[\text{C}]^y$ D) $-\frac{1}{2} \frac{d[\text{A}]}{dt} = \frac{d[\text{B}]}{dt} = K[\text{A}]^x[\text{B}]^y$	Chemical Kinetics
53	HCOOH and CH <sub>3</sub> COOH solution have equal p <sup>H</sup> . If $\frac{K_1}{K_2}$ (ratio of acid ionization constant) is 4, their molar concentration ratio will be A) 2 B) 0.5 C) 4 D) 0.25	Equilibrium
54	The number of S <sup>2-</sup> ions present in 1L of 0.1 M H <sub>2</sub> S solution having [H <sup>+</sup> ] = 0.1 M is (given $\text{H}_2\text{S} \rightleftharpoons 2\text{H}^+ + \text{S}^{2-}$ $K_a = 1.1 \times 10^{-21}$ ) A) $6.625 \times 10^3$ B) $6.625 \times 10^4$ C) $6.625 \times 10^5$ D) $6.625 \times 10^6$	Equilibrium
55	The value of observed and calculated molecular weight of silver nitrate are 92.64 and 170 respectively. The degree of dissociation of silver nitrate is _____ %	Solutions



56	<p>Which is most reactive towards <math>\text{SN}^2</math> reaction?</p> <p>A) <math>\text{CH}_3\text{Br}</math> B)  C)  D) </p> <p style="text-align: right;">Haloalkanes and Haloarenes</p>
57	<p> <math>\xrightarrow[\text{(2) H}^+]{\text{(1) hot alkaline KMnO}_4}</math> P; product P is</p> <p>A)  B)  C)  D) </p> <p style="text-align: right;">Aldehydes, Ketones and Carboxylic Acids</p>
58	<p><math>\text{p}^{\text{H}}</math> of normal rain water is _____</p> <p style="text-align: right;">Environmental Chemistry</p>
59	<p>A solution containing <math>\text{H}^+</math> and <math>\text{D}^+</math> ions is in equilibrium with a mixture of <math>\text{H}_2</math> and <math>\text{D}_2</math> gases at <math>25^\circ\text{C}</math>. If partial pressures of both gases are 1.0 atm, find the ratio of <math>[\text{D}^+] / [\text{H}^+]</math> is _____</p> <p><math>2\text{H}^+ + \text{D}_2 \rightleftharpoons \text{H}_2 + 2\text{D}^+</math> (Given: <math>E_{\text{D}^+/\text{D}_2}^0 = -0.003\text{V}</math>)</p> <p style="text-align: right;">Electrochemistry</p>
60	<p>10L bulb is containing moist gas having pressure 1160 torr. The bulb is connected to an evacuated bulb of capacity 5L through stopcock. When stopcock is opened, what is the final pressure of gas, assuming same temperature and aqueous tension of <math>\text{H}_2\text{O}</math> at same temperature = 20 torr</p> <p>A) 760 torr B) 860 torr C) 773.2 torr D) 780 torr</p> <p style="text-align: right;">States of Matter: Gases and Liquids</p>
61	<p>Which of the following will react fastest with Lucas reagent?</p> <p>A) Butan-1-ol B) Butan-2-ol C) 2-Methyl propan-2-ol D) Phenol</p> <p style="text-align: right;">Alcohols, Phenols and Ethers</p>

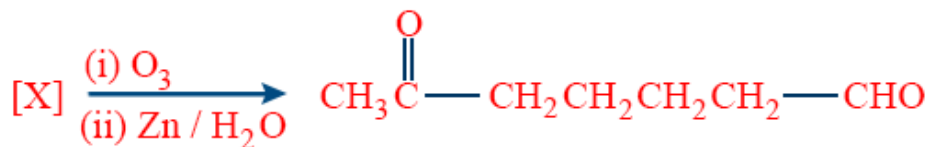
62 What are the major products from the following reaction?



- A) + B) +
- C) + D) +

Alcohols, Phenols and Ethers

63 In the given reaction [X]



- A)  $\text{CH}_3-\overset{\text{CH}_2}{\parallel}{\text{C}}-\text{CH}_2\text{CH}_2\text{CH}_2-\text{CH}=\text{CH}_2$
- B)  $\text{CH}_3-\text{CH}=\text{CH}-\text{CH}_2\text{CH}_2-\text{CH}=\text{CH}_2$  C)
- D)

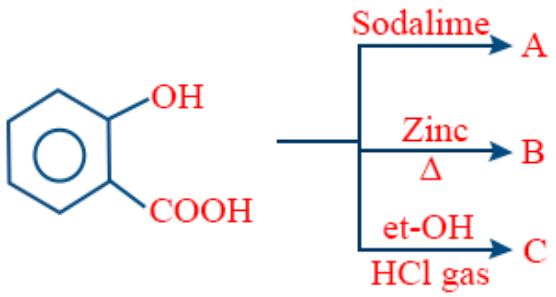
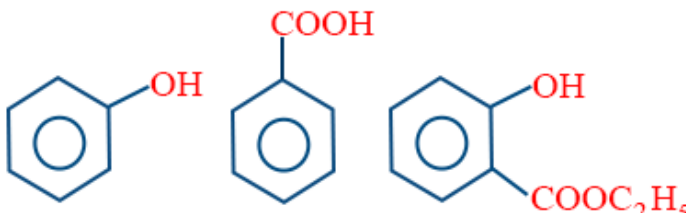
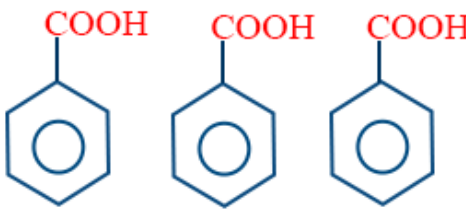
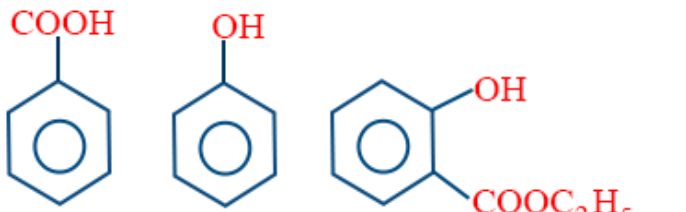
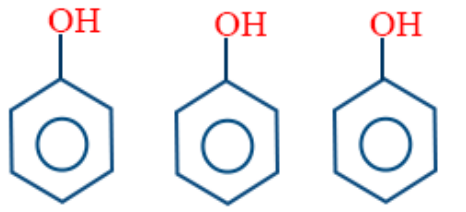
Hydrocarbons

64 The number of P-P bonds and oxidation state of phosphorous in hypophosphoric acid ( $\text{H}_4\text{P}_2\text{O}_6$ ) are respectively

- A) 0, +3 B) 0, +5 C) 1, +5 D) 1, +4

P - Block Elements

65	$\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O} \xrightarrow{\text{heat}} \text{X} + \text{NaBO}_2 + \text{H}_2\text{O}$ $\text{x} + \text{CoO} \xrightarrow{\text{heat}} \text{Y}(\text{blue coloured})$ X and Y are:	
	<b>A) Na<sub>3</sub>BO<sub>3</sub> and Co(BO<sub>2</sub>)<sub>3</sub> B) Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> and Co(BO<sub>2</sub>)<sub>3</sub> C) B<sub>2</sub>O<sub>3</sub> and Co(BO<sub>2</sub>) D) B<sub>2</sub>O<sub>3</sub> and Co(BO<sub>2</sub>)<sub>2</sub></b>	<b>p-BLOCK ELEMENTS GROUP 13(BORON FAMILY)</b>
66	Copper on reaction with dilute HNO <sub>3</sub> gives	
	<b>A) Cu(NO<sub>3</sub>)<sub>2</sub> + N<sub>2</sub>O B) Cu(NO<sub>3</sub>)<sub>2</sub> + NO<sub>2</sub> C) Cu(NO<sub>3</sub>)<sub>2</sub> + NO D) CuNO<sub>3</sub> + N<sub>2</sub>O</b>	<b>P - Block Elements</b>
67	Which of the following facts about the complex [Cr(NH <sub>3</sub> ) <sub>6</sub> ] Cl <sub>3</sub> is wrong?	
	<b>A) The complex involves d<sup>2</sup>sp<sup>3</sup> hybridisation and is octahedral in shape</b> <b>B) The complex is paramagnetic C) The complex is an outer orbital complex</b> <b>D) The complex gives white precipitate with silver nitrate solution.</b>	<b>Co-ordination Compounds</b>
68	In a cubic unit cell, seven of the eight corners are occupied by atoms A and centres of faces are occupied by atoms B. The general formula of the compound is :	
	<b>A) A<sub>7</sub> B<sub>6</sub> B) A<sub>7</sub> B<sub>12</sub> C) A<sub>7</sub> B<sub>24</sub> D) A<sub>24</sub> B<sub>7</sub></b>	<b>Solid State</b>
69	What is value of ΔE (heat change at constant volume) for reversible isothermal evaporation of 90g water at 100°C. Assuming water vapour behaves as an ideal gas and (ΔH <sub>vap</sub> ) <sub>water</sub> = 540 cal gm <sup>-1</sup>	
	<b>A) 9 × 10<sup>3</sup> cal B) 6 × 10<sup>3</sup> cal C) 4.49 cal D) 44.870 × 10<sup>3</sup> cal</b>	<b>Chemical Thermodynamics</b>
70	The prussian blue colour obtained during the test of nitrogen by Lassaigne's test is due to the formation of	
	<b>A) Fe<sub>4</sub>[Fe(CN)<sub>6</sub>]<sub>3</sub> B) Na<sub>3</sub>[Fe(CN)<sub>6</sub>] C) Fe(CN)<sub>3</sub> D) Na<sub>4</sub>[Fe(CN)<sub>5</sub> NOS]</b>	<b>Organic Chemistry: Some basic Principles and Techniques</b>
71	Which one of the following sets of ions represents the collection of isoelectronic species?	
	<b>A) K<sup>+</sup>, Ca<sup>2+</sup>, SC<sup>3+</sup>, Cl<sup>-</sup> B) Na<sup>+</sup>, Mg<sup>2+</sup>, Al<sup>3+</sup>, Cl<sup>0</sup> C) K<sup>+</sup>, Cl<sup>-</sup>, Mg<sup>2+</sup>, SC<sup>3+</sup> D) Na<sup>+</sup>, Ca<sup>2+</sup>, SC<sup>3+</sup>, F<sup>0</sup></b>	<b>Chemical Bonding and Molecular Structure</b>
72	Diatomic molecule has a dipole moment of 1.2 D. If its bond is 1.0 Å. Then the fraction of an electronic charge exists on each atom is _____ %.	
		<b>Chemical Bonding and Molecular Structure</b>

73	<p>The decreasing order of acidic characters of the following is:            (I) P-Nitrophenol, (II) O-Nitrophenol, (III) m-Nitrophenol, (IV) Phenol</p> <p><b>A) I &gt; II &gt; III &gt; IV B) II &gt; I &gt; III &gt; IV C) I &gt; II &gt; IV &gt; III D) II &gt; I &gt; IV &gt; III</b></p> <p style="text-align: right;"><b>Alcohols, Phenols and Ethers</b></p>
74	<p>The incorrect statement among the following is</p> <p><b>A) Amylopectin is water soluble.</b>  <b>B) Lactose is composed of <math>\beta</math>-D-galactose and <math>\beta</math>-D-glucose joined by 1, 4 glycosidic linkage.</b>  <b>C) Sucrose is a non-reducing sugar. D) Glycine is Optically inactive amino acid.</b></p> <p style="text-align: right;"><b>Bio Molecules</b></p>
75	<div style="text-align: center;">  </div> <p>The products A, B, C are respectively</p> <div style="display: flex; justify-content: space-around;"> <div data-bbox="194 1050 941 1281"> <p><b>A)</b></p>  </div> <div data-bbox="958 1050 1485 1281"> <p><b>B)</b></p>  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div data-bbox="194 1554 941 1785"> <p><b>D)</b></p>  </div> <div data-bbox="958 1302 1485 1533"> <p><b>C)</b></p>  </div> </div> <p style="text-align: right;"><b>Aldehydes, Ketones and Carboxylic Acids</b></p>

**Key**

1) A	2) C	3) D	4) A	5) B	6) A	7) B	8) B	9) C	10) B	11) A	12) 5
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13) 833	14) C	15) C	16) B	17) B	18) A	19) C	20) 0	21) 168474	22) B	23) C	24) 5
25) C	26) D	27) C	28) A	29) D	30) 18	31) A	32) D	33) 5.66	34) B	35) B	36) 80
37) C	38) A	39) A	40) C	41) B	42) B	43) A	44) B	45) A	46) 20	47) 2.6	48) C
49) B	50) C	51) 8.4	52) C	53) D	54) A	55) 83.5	56) A	57) B	58) 5.6	59) 1.12	60) D
61) C	62) B	63) C	64) D	65) D	66) C	67) C	68) C	69) D	70) A	71) A	72) 25
73) A	74) A	75) A									