PAPER – 2

TEST CODE - 2004 | **CLASS – XII** | **BOOKLET - B**

Date :- 27– 06 - 2010 | **Duration : 3 Hours** | **Max. Marks : 240**

INSTRUCTIONS

Each of the three parts of the paper contains Section-A, Section-B & Section-C. Section-A contains 8 questions, Section-B contains 2 questions and Section-C contains 6 questions. Total number of pages are **24**. Please ensure that the Questions paper you have received contains ALL THE QUESTIONS in each part and section and PAGES.

SECTION - A

1. **Q. 1** to **Q. 5** has four choices (A), (B), (C), (D) Out of which **only one is correct** and carry **4 marks** each and 1 mark will be deducted for each wrong answer.

4. **Q. 6** to **Q.8** are based upon **a paragraph**. Each Questions has 4 choices (A), (B), (C), (D) out of which only **one is correct** & carry **3 marks** each. **1** mark will be deducted for each wrong answer.

SECTION - B

2. **Q.1** to **Q.2** are **Matrix Match Type** questions. In **Q.**1, **Column-I** contains Three (A,B,C) entries and **Column-II** contains Four (P,Q,R,S) entries. Entry of **Column-I** are to be matched with **only one entry** of **Column-II or vice versa. 3 mark** will be awarded for each part of **Column-I**. 1 mark will be deducted for each wrong answer.

In **Q.** 2, **Column-I** contains Four (A,B,C,D) entries and **Column-II** contains Five (P,Q,R,S,T) entries. Entry of **Column-I** are to be matched with **one or more than one entries** of **Column-II or vice versa. 3 mark** will be awarded for each part of **Column-I**. NO NEGATIVE marking for this Question.

SECTION - C

3. **Q.1** to **Q.6** are **integer answer type questions** (whose answers are upto 4 digits) & carry **5 marks** each. 1 mark will be deducted for each wrong answer.

NOTE : GENERAL INSTRUCTION FOR FILLING THE OMR ARE GIVEN BELOW.

1. Use only **HB pencil** or **blue/black pen (avoid gel pen)** for darkening the bubble.

2. Indicate the correct answer for each question by filling appropriate bubble in your OMR answer sheet.

3. The Answer sheet will be checked through computer hence, the answer of the question must be marked by shading the circles against the question by dark **HB pencil or blue/black pen**.

4. While filling the bubbles please be careful about SECTIONS [i.e. Section-A include single correct answers, reasoning type, multiple correct answers, paragraph type), Section-B (include matrix match type), Section-C (include integer answers type)].

SECTION-A	SECTION-B	SECTION-C
For example if only 'A' choice is correct then, the correct method for filling the bubble is A B C D E ● ○ ○ ○ ○ For example if only 'A & C' choices are correct then, the correct method for filling the bubble is A B C D E ● ○ ● ○ ○ the wrong method for filling the bubble are ⊘ ⊗ ◉ ◉ ◉ The answer of the questions in wrong or any other manner will be treated as wrong.	For example If Correct match for (A) is P; for (B) is R, S; for (C) is Q; for (D) is P, Q, S then the correct method for filling the bubble is P Q R S T A ● ○ ○ ○ ○ B ○ ○ ● ● ○ C ○ ● ○ ○ ○ D ● ● ○ ● ○	**Ensure that all columns are filled**. Answers, having blank column will be treated as incorrect. Insert leading zero(s) if required : '6' should be filled as 0006 '86' should be filled as 0086 '1857' should be filled as 1857

PART - I [MATHEMATICS]

SECTION - (A)

[STRAIGHT OBJECTIVE TYPE]

Q.1 to ***Q.5*** has four choices (A), (B), (C), (D) out of which ***ONLY ONE*** is correct

1. If $f(1) = 5, f'(1) = 2, f''(1) = 4$, then $(f^{-1})''(5)$ is equal to

(A) 1 (B) $-\frac{1}{2}$ (C) -2 (D) none of these

2. Let sum of first three terms of G.P. with Real terms is $\frac{21}{10}$, and their product is -8. If the absolute value of the sum of their infinite terms is $\frac{p}{q}$, (where p and q are relatively prime) then the value of $p - q$ is equal to

(A) 1 (B) 7 (C) 9 (D) 10

(SPACE FOR ROUGH WORK)

3. If $\sin^{-1} x_1 + \sin^{-1}x_2 + \ldots\ldots\ldots + \sin^{-1}x_n \le -\frac{n\pi}{2}$, $\forall$ $n \in N$, then for $n = 2m + 1$, $m \ge 1$ the value of

$$\frac{x_1^{\,1} + x_3^{\,3} + x_5^{\,5} + \ldots\ldots(m+1)\text{ terms}}{x_2^{\,2} + x_4^{\,4} + x_6^{\,6} + \ldots\ldots\ldots m\text{ terms}}$$ is

(A) 1 (B) –1 (C) $\frac{n+1}{1-n}$ (D) $\frac{1-n}{1+n}$

4. If $f(x) = \lim\limits_{n\to\infty} \tan^{-1}\left(4n^2\left(1-\cos\frac{x}{n}\right)\right)$ & $g(x) = \lim\limits_{n\to\infty} \frac{n^2}{2} \ell n \cos\left(\frac{2x}{n}\right)$ then $\lim\limits_{x\to 0} \frac{e^{-2g(x)} - e^{f(x)}}{x^6}$ equals

(A) $\frac{8}{3}$ (B) $\frac{7}{3}$ (C) $\frac{5}{3}$ (D) $\frac{2}{3}$

5. Let f(x) & g(x) be two functions defined on $R \to R$ such that $f(x) \cdot g(x) = 1$ then the value of $\frac{f'''(x)}{f'(x)} - \frac{g'''(x)}{g'(x)}$ is

(A) $3\left(\frac{f''}{g} - \frac{g''}{f}\right)$ (B) $3\left(\frac{g''}{g} - \frac{f''}{f}\right)$ (C) $3\left(\frac{f''}{f} - \frac{g''}{g}\right)$ (D) $3\left(\frac{g''}{f} - \frac{f''}{g}\right)$

(SPACE FOR ROUGH WORK)

[COMPREHENSION TYPE]

Q.6 to ***Q.8*** are based upon a paragraph. Each questions has four choice (A), (B), (C), (D) out of which ***ONLY ONE*** is correct

If $f(x) = \tan^{-1}x$ & $g(x) = \log x$, then a function h(x) is defined as $h(x) = g\left(f(-x) + f\left(\frac{1}{x}\right)\right)$

6. Domain of h(x) is

(A) $(-\infty, -1)$ (B) $R - [-1, 0)$ (C) $(-\infty, -1) \cup (0, 1)$ (D) $(-1, 1) - \{0\}$

7. Range of h(x) is

(A) $\left(-\infty, \log\frac{\pi}{2}\right)$ (B) $\left(-\infty, \log\frac{\pi}{2}\right]$ (C) $\left(0, \log\frac{\pi}{2}\right)$ (D) $\left(0, \log\frac{\pi}{2}\right]$

8. If h(x) is defined for negative 'x' only then $h^{-1}(x)$ is

(A) $\tan\left(\frac{\pi}{4} - \frac{10^x}{2}\right)$ (B) $-\cot\left(\frac{\pi}{4} + \frac{10^x}{2}\right)$ (C) $-\tan\left(\frac{\pi}{4} + \frac{10^x}{2}\right)$ (D) $\cot\left(\frac{\pi}{4} - \frac{10^x}{2}\right)$

(SPACE FOR ROUGH WORK)

SECTION - (B)

[MATRIX MATCH TYPE]

***Q.1 is "Match the Column"** type. **Column - I** Constains three (i.e. A,B, C,) entries and column-II contains four (i.e. P,Q,R,S,) entries. Entry of column-I are to be matched with **ONLY ONE ENTRY** of column-II or vice versa.*

1.

	Column – I	**Column – II**
(A)	If the area bounded by the curve $\|y\| = \cos^{-1}(\cos x)$ for $x \in [-4\pi, 4\pi]$ is $2k\pi^2$, $k \in N$ then k equals	(P) 1
(B)	If $f'(x) = \frac{1}{\sqrt{3x^2+4}}$ & g be the Inverse of f, g(a) = 2 then $g'(a)$ is	(Q) 8
(C)	If $L = \lim_{x\to 0} \frac{(e^{2x}+1)-(x+1)(e^x+e^{-x})}{x(e^x-1)}$ then 4L is equal to	(R) 4 (S) $\frac{1}{2}$

(SPACE FOR ROUGH WORK)

***Q.2 is "Match the Column"** type. **Column - I** Constains four (i.e. A,B, C,D) entries and column-II contains five (i.e. P,Q,R,S,T) entries. Entry of column-I are to be matched with **ONE OR MORE THAN ONE ENTRIES** of column-II or vice versa.*

2.

	Column – I	**Column – II**
(A)	If $f(x) = \frac{\sqrt{x^2+kx+2}}{kx^2-1}$ is continuous for all $x \in R$, then [k] may be equal to	(P) –2
(B)	If $f(x) = \text{sgn } x$; $g(x) = x(x^2-1)$ then period of the function $h(x) = gof(x)$ may be	(Q) –1
(C)	$L = \lim_{n\to\infty} \frac{\left\{(n+1)\left(n+\frac{1}{2}\right).....\left(n+\frac{1}{2^{n-1}}\right)\right\}^n}{n^{n^2}}$ then ℓn (L) is equal to	(R) 0
(D)	No. of real x satisfying the equation $\frac{1}{x}\ell n\, x = \frac{1}{2}\ell n\, 2$ is/are	(S) 1
		(T) 2

(SPACE FOR ROUGH WORK)

SECTION - (C)

[INTEGER ANSWER TYPE]

Q.1 to **6** are ***INTEGER ANSWER TYPE*** Questions. (The answer of each of the questions **are upto 4 digits)**

1. Let 'a' denote the roots of equation $\cos(\cos^{-1} x) + \sin^{-1} \sin\left(\frac{1+x^2}{2}\right) = 2\sec^{-1}(\sec x)$ then highest possible values of $[|10a|]$ will be
(where $[*]$ denotes the greatest integer function)

2. If $f(x) = \frac{[x].\sin\frac{x}{[x+1]} + \sin\pi[x+1]}{1+[x]}$ then number of point(s) where f(x) is discontinuous in [0, 6] is/are :
(where $[*] \rightarrow$ denotes greatest integer function)

3. If $f(x) = \begin{cases} \frac{\tan[x^2]\pi}{ax^2} + ax^3 + b\ , & 0 \le x \le 1 \\ 2\cos\pi x + \tan^{-1} x\ , & 1 < x \le 2 \end{cases}$ is differentiable in [0, 2], then $a = \frac{1}{k_1}$ and $b = \frac{\pi}{4} - \frac{26}{k_2}$; $k_1, k_2 \in N$

Find the value of $k_1^2 + k_2^2$ {where [.] denotes greatest integer function}.

(SPACE FOR ROUGH WORK)

4. Let $f(x) = \begin{cases} (\cos x - \sin x)^{\text{cosec}x} & ; \ -\frac{\pi}{2} < x < 0 \\ a & ; \ x = 0 \\ \frac{e^{1/x} + e^{2/x} + e^{3/x}}{a.e^{2/x} + b.e^{3/x}} & ; \ 0 < x < \frac{\pi}{2} \end{cases}$

If f(x) is continuous at x = 0, then the value of a.b is :

5. If for $\pi < x < \frac{3\pi}{2}$, $y = \exp[(\sin^2 x + \sin^4 x + ...\infty)\log_e 2]$

is a root of a quadratic equation $x^2 - 9x + 8 = 0$. If the value of $\frac{\sin x + \cos x}{\sin x - \cos x}$ is expressed in form of $a + \sqrt{b}$, a and b are relatively prime then the value of a + b is :

6. Let f(x) be defined in the interval [–2, 2] such that $f(x) = \begin{cases} x & , \ -2 \le x < 1 \\ x^2 - 1 & , \ 1 \le x \le 2 \end{cases}$ then consider g(x) = |f(x)| – f(– x).

Then number of points where g(x) is non-differentiable over interval [–2, 2] is/are

(SPACE FOR ROUGH WORK)

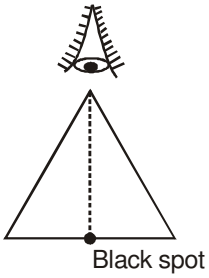
PART - II [PHYSICS]

SECTION - (A)

[STRAIGHT OBJECTIVE TYPE]

Q.1 to ***Q.5*** has four choices (A), (B), (C), (D) out of which ***ONLY ONE*** is correct

1. A black spot is present at the centre of the face of an equilateral prism. A man places his eye directly at the opposite corner. He sees two images of the spot at an angular separation of 60°. Then the condition on the refractive index of the prism is :



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

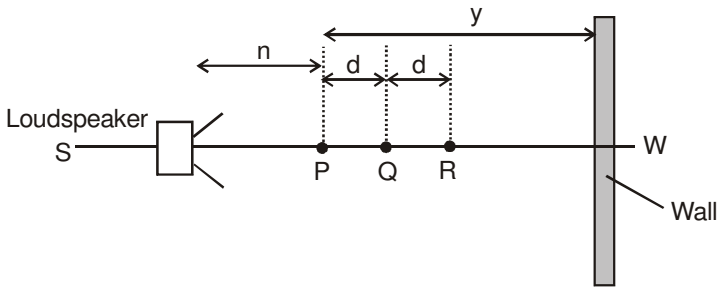
(B) $\mu > 2$

(C) $\mu < 2$

(D) $\mu > \frac{2}{\sqrt{3}}$

(SPACE FOR ROUGH WORK)

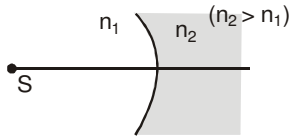
2. A loudspeaker emits sound of frequency f. The sound waves are reflected from a wall. The arrangement is shown below. When a microphone is moved along the line SW, minimum loudness of sound is detected at points P, Q and R. There are no other minima between these points. The separation of the minima is d. The speed of the sound wave is :



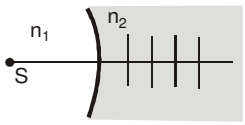
(A) $\frac{1}{2}$fd (B) $\frac{f}{d}$ (C) f d (D) 2 f d

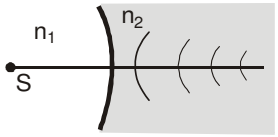
(SPACE FOR ROUGH WORK)

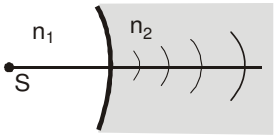
3. A source is placed infront of a spherical surface as shown in the figure.



The shape of wavefront after refraction from the spherical surface is

(A) 

(B) 

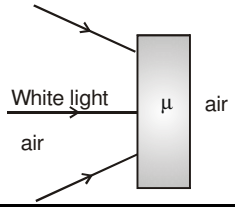
(C) 

(D) none of these

4. A physicist hanged a cylinder-shaped container of base A m^2 to a spring. He slowly poured water into the container and found that the surface of water remained at the same level. Find the spring constant k of the spring. (Density of water = ρ)

(A) ρAg (B) ρA (C) Ag (D) ρA/g

5. Which color will be converged farthest from the slab.



(A) Voilet (B) Red

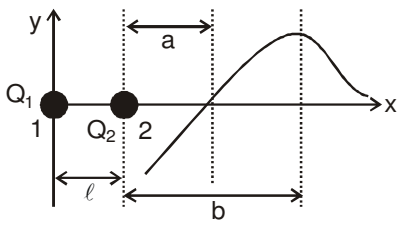
(C)Yellow (D) all color will be converged at same point.

(SPACE FOR ROUGH WORK)

[COMPREHENSION TYPE]

Q.6 to ***Q.8*** are based upon a paragraph. Each questions has four choice (A), (B), (C), (D) out of which ***ONLY ONE*** is correct

Two point like charges Q_1 and Q_2 are positioned at point 1 and 2. The field intensity to the right of the charge Q_2 on the line that passes through the two charges varies according to a law that is represented schematically in the figure. The field intensity is assumed to be positive if its direction coincides with the positive direction on the x-axis. The distance between the charges is ℓ.



6. The sign of each charge Q_1 and Q_2 is :

(A) +, – (B) –, + (C) +, + (D) none of these

7. Find the ratio of the absolute values of the charges $\left|\frac{Q_1}{Q_2}\right|$

(A) $\left(\frac{a+\ell}{a}\right)^2$ (B) $\left(\frac{\ell}{a}\right)^2$ (C) $\left(\frac{a}{a+\ell}\right)^2$ (D) none of these

8. Find the value of b where the field intensity is maximum.

(A) $\frac{\ell}{(Q_1/Q_2)^{1/3}+1}$ (B) $\frac{\ell}{(Q_1/Q_2)^{1/3}-1}$ (C) $\frac{\ell}{(Q_2/Q_1)^{1/3}+1}$ (D) none of these

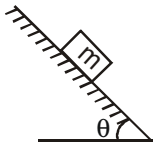
(SPACE FOR ROUGH WORK)

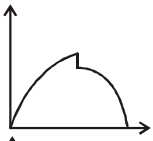
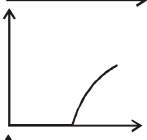
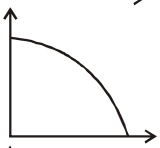
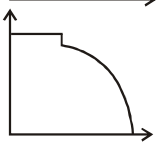
SECTION - (B)

[MATRIX MATCH TYPE]

***Q.1 is "Match the Column"** type. **Column - I** Constains three (i.e. A,B, C,) entries and column-II contains four (i.e. P,Q,R,S,) entries. Entry of column-I are to be matched with **ONLY ONE ENTRY** of column-II or vice versa.*

1. A block placed on a rough inclined plane. Angle of inclination θ of the plane as shown in varies starting from zero. The coefficient of static friction and kinetic friction between the block and the plane is μ_s and μ_k respectively ($\mu_s > \mu_k$). Column - II shows the graphs the which necessarily contains θ taken on x-axis. Column - II represents the quantities taken on y - axis of column - I. Match the quantities of column - I with graphs of column - II.

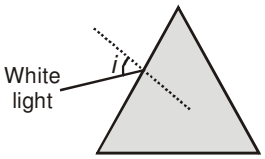
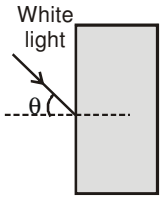
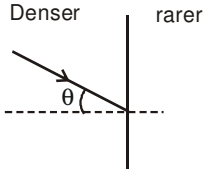
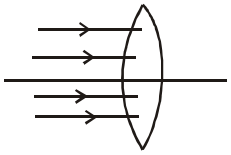


Column - I	Column - II
(A) Friction force between the block and plane.	(P) 
(B) Normal force between the block and the plane	(Q) 
(C) Total contact force between the block and the plane	(R) 
	(S) 

(SPACE FOR ROUGH WORK)

***Q.2 is "Match the Column"** type. **Column - I** Constains four (i.e. A,B, C,D) entries and column-II contains five (i.e. P,Q,R,S,T) entries. Entry of column-I are to be matched with **ONE OR MORE THAN ONE ENTRIES** of column-II or vice versa.*

2. Light rays are incident on devices which may cause either reflection or refraction or both. The natures of the incident light and the devices are described in column A. Some possible results of this on the rays are given in column - II

Column - I		**Column - II**
(A) A ray of white light is incident on one face of an equilateral glass prism		(P) Divergent beam
(B) A ray of white light is incident at an angle on a thick glass sheet		(Q) Total internal reflection
(C) A ray of white light passes from an optically denser medium to an optically rarer medium		(R) Lateral shift
(D) A parallel beam of white light passes a glass lens. symmetrically through		(S) Dispersion (T) Chromatic aberration

(SPACE FOR ROUGH WORK)

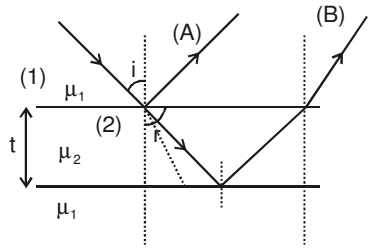
SECTION - (C)

[INTEGER ANSWER TYPE]

Q.1 to **6** are ***INTEGER ANSWER TYPE*** Questions. (The answer of each of the questions **are upto 4 digits)**

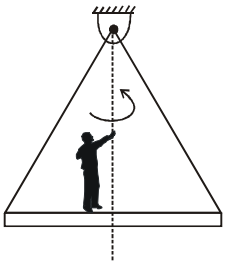
1. Two plane progressive transverse waves having equations $y = 3 \sin (kx + \omega t)$ and $y = 5 \sin (kx - \omega t)$ are traveling in –ve x axis and +ve x axis respectively on a long string. The energy passing through the node of resulting wave per second is of the form $\left(\frac{A_0 \rho \omega^3 S}{k}\right)$. Calculate the value of A_0 ? Density of string is ρ and cross-sectional area is S, angular frequency is ω and wave number is k.

2. There are two transparent media (1) and (2) with refractive indices μ_1 and μ_2. ($\mu_1 > \mu_2$) A light ray is entering from medium (1) to medium (2) at angle of incidence i. Thickness of medium (2) is t. Two light rays A and B are forming interference pattern as shown in figure. Then minimum thickness of medium (2) so that rays A and B are interfering fully constructive, is of the form $\frac{(2n-1)\lambda}{B_0 \mu_2 \cos r}$. Find the value of B_0. where r is angle of refraction for ray entering medium (2) from medium (1) and λ is wavelength of light in air.

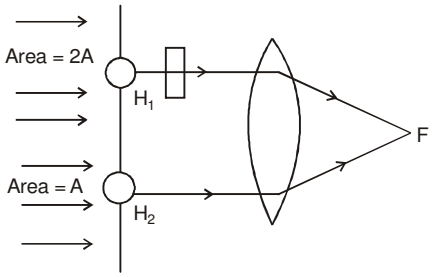


(SPACE FOR ROUGH WORK)

3. To determine the MI of an object we can use torsion pendulum method. If the torsional constant of the apparatus (a disc suspended by the threads) is C = 12.5 Nm/rad. If the empty torsion pendulum (without the man) has a time period $T_0 = 2$ s and that with the man is T = 3.2 s, find the MI of the man.

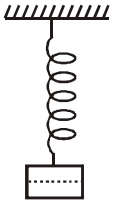


4. Two small holes (H_1 & H_2) of area 2A & A are illuminated by coherent monochromatic parllel beam of light having wavelength λ, as shown in figure below. A thin transparent film is placed in front of the bigger hole. There is a convex lens with its principal axis perpendicular to line joining the two holes H_1 & H_2. placed symmetrically with respect to holes the refractive index of film is $\frac{3}{2}$ and thickness is $\frac{\lambda}{4}$. If 10% of the power incident (P_1) on the holes goes in the original direction and power received at F is P_2, find the value of $\frac{P_1}{P_2}$

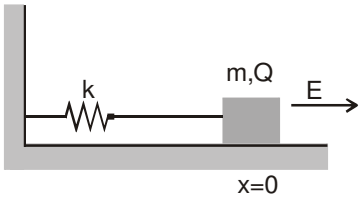


(SPACE FOR ROUGH WORK)

5. A vertical spring-block system is oscillating with amplitude 1.5 cm as shown below. The lower half of the mass splits and drops down (without exerting any reaction) at the lowest point during oscillation. Find maximum speed (in cm/sec) of the upper half of the block during subsequent motion. (Mass of the block = 5 kg and spring constant = 1000 N/m)



6. A 4.00 kg block carrying a charge Q = 50.0 μC is connected to a spring for which k = 100 N/m. The block lies on a frictionless horizontal track, and the system is immersed in a uniform electric field of magnitude $E = 10^6$ V/m, directed as shown in figure. If the block is released from rest when the spring is unstretched (at x = 0)



By what maximum amount does the spring expand ?

(SPACE FOR ROUGH WORK)

PART - III [CHEMISTRY]

SECTION - (A)

[STRAIGHT OBJECTIVE TYPE]

Q.1 to ***Q.5*** has four choices (A), (B), (C), (D) out of which ***ONLY ONE*** is correct

1. A mixture of 20 ml of CO, CH_4 and N_2 was burnt in excess of O_2 resulting in reduction of 13 ml of volume. The residual gas was then treated with KOH solution to show a reduction in volume of 14 ml. Then the volume of N_2 in the mixture is :
(A) 10 ml (B) 6 ml (C) 4 ml (D) 8 ml

2. The molar enthalpy of combustion of heptane gas, $C_7H_{16}(g)$. is –4853.4 kJ mol^{-1}. Given, the standard molar enthalpy of formation of carbon dioxide gas is: $\Delta H^{\circ}_f(CO_2.g) = -393.5$ kJmol^{-1}, and the standard molar enthalpy of formation of liquid water is : $\Delta H^{\circ}_f(H_2O,l) = -285.9$ kJmol^{-1}, estimate the value for the standard molar enthalpy of formation of heptane gas, $\Delta H^{\circ}_f(C_7H_{16}.g)$.
(A) –188.3 kJmol^{-1} (B) +723.4 kJmol^{-1} (C) +188.3 kJmol^{-1} (D) –723.4 kJmol^{-1}

(SPACE FOR ROUGH WORK)

3. One mole of a monoatomic ideal gas initially at a pressure of 2.00 bar and a temperature of 273 K is taken to a final pressure of 4.00 bar by a reversible path defined by p/V = constant. Taking C_V to be equal to 12.5 J $mol^{-1}K^{-1}$, the value of $\Delta U/w$ for this process is calculated to be

(A) –3.0 (B) –1.5 (C) +1.5 (D) +3.0

4. If an insulated beaker contains 25 g of ice at –20º C and 15 kJ are added to the ice, what is the final temperature of the H_2O? The specific heat capacity of ice is 2.03 J/gºC, specific heat capacity of water is 4.184 J/gºC, specific heat capacity of water gas is 1.8 J/gºC, the enthalpy of fusion for water is 333 J/g, and the enthalpy of vaporization is 2256 J/g.

(A) 30ºC (B) 42ºC (C) 54ºC (D) 63ºC

5. % w/v of H_2O_2 solution if 500 ml of H_2O_2 solution produces 24 gm of O_2

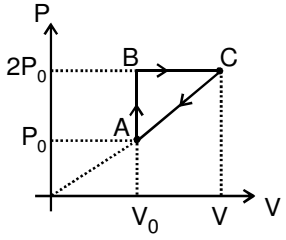
(A) 5.1 % (B) 10.2 % (C) 20.4 % (D) 40.8 %

(SPACE FOR ROUGH WORK)

[COMPREHENSION TYPE

Q.6 to ***Q.8*** are based upon a paragraph. Each questions has four choice (A), (B), (C), (D) out of which ***ONLY ONE*** is correct

n moles of a diatomic gas has undergone a cyclic process ABC as shown in figure. Temperature at A is T_0.



6. Volume at C is:
(A) $3V_0$ (B) $3/2\ V_0$ (C) $2\ V_0$ (D) $4\ V_0$

7. Total heat given to gas is :
(A) $\frac{19}{2}P_0V_0$ (B) $\frac{15}{2}P_0V_0$ (C) P_0V_0 (D) None of these

8. The efficiency is
(A) $\frac{100}{19}\%$ (B) $\frac{19}{100}\%$ (C) $\frac{190}{100}\%$ (D) None of these

(SPACE FOR ROUGH WORK)

SECTION - (B)

[MATRIX MATCH TYPE]

***Q.1 is "Match the Column"** type. **Column - I** Constains three (i.e. A,B, C,) entries and column-II contains four (i.e. P,Q,R,S,) entries. Entry of column-I are to be matched with **ONLY ONE ENTRY** of column-II or vice versa.*

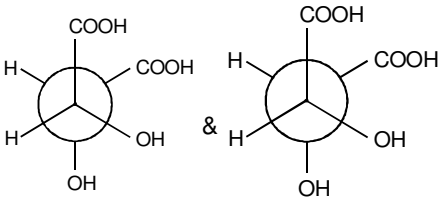
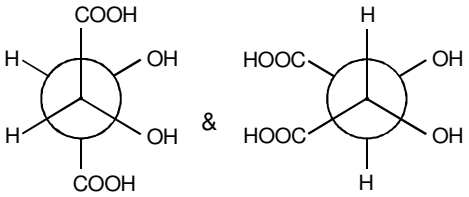
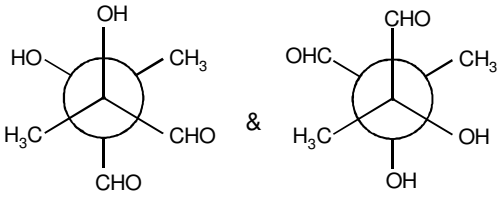
1. Match the Column

	Column-I		**Column-II**
(A)	$aCu + bHNO_3 \rightarrow cCu(NO_3)_2 + dNO + eH_2O$		
	The value of b + c + e –3	(P)	12
(B)	$Ba(SCN)_2 \rightarrow Ba^{2+} + NH_3 + SO_4^{2-} + CO_2$		
	The n-factor of $Ba(SCN)_2$ is x, then value of x – 1	(Q)	13
(C)	$K_4[Fe(CN)_6] \rightarrow K^+ + Fe^{3+} + CO_2 + NH_3$		
	n-factor of $K_4[Fe(CN)_6]$ is y, then the value of y	(R)	15
		(S)	14

(SPACE FOR ROUGH WORK)

***Q.2 is "Match the Column"** type**. Column - I** Constains four (i.e. A,B, C,D) entries and column-II contains five (i.e. P,Q,R,S,T) entries. Entry of column-I are to be matched with **ONE OR MORE THAN ONE ENTRIES** of column-II or vice versa.*

2. Match the Column

Column-I		**Column-II**	
(A)		(P)	Identical
(B)		(Q)	Stereo isomers
(C)		(R)	Enantiomers
(D)		(S)	Geometrical isomers
		(T)	distereo isomers

(SPACE FOR ROUGH WORK)

SECTION - (C)

[INTEGER ANSWER TYPE]

Q.1 to **6** are ***INTEGER ANSWER TYPE*** Questions. (The answer of each of the questions **are upto 4 digits)**

1. $a\ KMnO_4 + bHCl \rightarrow cMnCl_2 + d\ KCl + eCl_2 + fH_2O$
Minimum value of sum of a, b, c, d, e, & f is:

2. The minimum molecular weight of hydrocarban showing optical & geometrical isomerism both is x, the minimum molecular weight of hydrocarban showing geometrical isomerism is y & the minimum molecular weight of compound showing isomerism is z. The sum of x, y & z is:

3. 100 ml, 6 M NaCl solution is mixed with 100 ml of 17% (w/w) $AgNO_3$ ($d_{sol}^{n.}$ = 8gm/ml) solution . The molarity of Ag^+ ions in the final solution is (M.W. of $AgNO_3$ = 170)

4. The standard molar enthalpy of combustion of $C_4H_{10}(g)$ is –2800 kJ mol^{-1} and standard molar enthalpy of combustion of $CH_4(g)$ is – 700 kJ mol^{-1}. A butane burner uses 1.5 L of butane gas per hour. If butane burner is to be replaced by methane burner, what should be the rate of supply of $CH_4(g)$ in order to have same fuel value?

5. The constant volume molar heat capacity of an ideal gas is expressed by
$C_{V,m} = 16.5 + 10^{-2}\ T$ (All values are in SI Units)
If 2.5 mol of this gas at constant volume is heated from 27ºC to 127ºC, the internal energy increases by "x" kJ. Hence, x is

6. Total isomer of dichloro derivative of cyclopropane is x & total isomer of monochloro derivative of isopentane is y. The sum of x & y is :

(SPACE FOR ROUGH WORK)

Rough Space