VMC Vidyamandir Classes SINCE 1986
IIT JEE | MEDICAL | FOUNDATION

CODE A

Mock JEE Advanced-1 (CBT) | Paper – 2 | JEE 2024

Maximum Marks: 180

Timing: 2:00 PM to 5:00 PM **Duration: 3.0 Hours**

General Instructions

1. The question paper consists of 3 Subject (Subject I: **Mathematics**, Subject II: **Physics,** Subject III: **Chemistry**). Each Part has **four** sections (Section 1, Section 2, Section 3 and Section 4).
2. **Section 1** contains **4 Multiple Choice Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE** is correct.

   Section 2 contains **3 Multiple Correct Answers Type Questions**. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE THAN ONE CHOICE** is correct.

   Section 3 contains **6 Non-Negative Integer Type Questions**. The answer to each question is a **NON-NEGATIVE INTEGER.** For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.

   Section 4 contains **2** Paragraphs. Based on each paragraph, there are **TWO (02)** questions. The answer to each question is a **NUMERICAL VALUE.** For each question, enter the correct numerical value of the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer. If the numerical value has more than two decimal places, **truncate/round-off** the value to **TWO** decimal places
3. For answering a question, an ANSWER SHEET (OMR SHEET) is provided separately. Please fill your **Test Code, Roll No.** and **Group** properly in the space given in the ANSWER SHEET.

Name of the Candidate (In CAPITALS) : _____

Roll Number : _____

OMR Bar Code Number : _____

Candidate's Signature : _____ Invigilator's Signature _____

MARKING SCHEME

SECTION – 1 | (Maximum Marks: 12)

- This section contains **Four (04)** Multiple Choice Questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme.

Full Marks : +3 If ONLY the correct option is chosen.

Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered).

Negative Marks : −1 In all other cases.

SECTION – 2 | (Maximum Marks: 12)

- This section consists of **Three (03)** Questions. Each question has **FOUR** options. **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- Answer to each question will be evaluated according to the following marking scheme:

Full Marks: +4 If only (all) the correct option(s) is(are) chosen

Partial Marks: +3 If all the four options are correct but ONLY three options are chosen

Partial Marks: +2 If three or more options are correct but ONLY two options are chosen and both of which are correct

Partial Marks: +1 If two or more options are correct but ONLY one option is chosen, and it is a correct option

Zero Mark: 0 if none of the options is chosen (i.e. the question is unanswered)

Negative Marks: –2 In all other cases.

SECTION – 3 | (Maximum Marks: 24)

- This section contains **SIX (06)** Questions.
- The answer to each question is a **NON-NEGATIVE INTEGER**
- For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.
- Answer to each question will be evaluated according to the following marking scheme.

Full Marks : +4 If ONLY the correct integer is entered;

Zero Marks : 0 In all other cases.

SECTION – 4 | (Maximum Marks: 12)

- This section contains **Two (02)** Paragraphs. Based on each paragraph, there are **TWO (02)** questions. The answer to each question is a **NUMERICAL VALUE.**
- For each question, enter the correct numerical value of the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.
- If the numerical value has more than two decimal places, **truncate/round-off** the value to **TWO** decimal places.
- Answer to each question will be evaluated according to the following marking scheme.

Full Marks : +3 If ONLY the correct numerical value is entered in the designated place.

Zero Marks : 0 In all other cases

SUBJECT I : MATHEMATICS 60 MARKS

SECTION-1

SINGLE CHOICE QUESTIONS

This section consists of 4 Multiple Choice Questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE** is correct.

1. Let g be a differentiable function satisfying $\int_0^x (x-t+1)\,g(t)\,dt = x^4 + x^2 + ax + b,\ \forall\, x \geq 0$ then

$$\int_0^1 \frac{6(a+g'(0))}{g'(x)+g(x)+b+10}\,dx =$$

(A) $\frac{\pi}{6}$ **(B)** $\frac{\pi}{3}$ **(C)** $\frac{\pi}{4}$ **(D)** $\frac{\pi}{2}$

2. A fair coin is tossed repeatedly until two consecutive heads is obtained. Then probability that two consecutive heads occur on the 7^{th} and 8^{th} flips is equal to:

(A) $\frac{12}{256}$ **(B)** $\frac{13}{256}$ **(C)** $\frac{20}{256}$ **(D)** $\frac{21}{256}$

3. Consider $f(x) = \tan^{-1}\left(\frac{|x|}{\sqrt{1-x^2}}\right) + \cos^{-1}\left(\frac{1}{\sqrt{1+x^2}}\right)$ then which one is not true?

(A) Maximum value of $f(x)$ is $\frac{3\pi}{4}$

(B) Number of integers in the range of $f(x)$ is 3

(C) Number of solutions of $f(x) = 2$ is 2

(D) If $\theta \in \left(\frac{\pi}{4}, \frac{\pi}{2}\right)$ then $f(\sin\theta) > f(\cos\theta)$

4. Position vector of a point A is $(a\hat{i} + b\hat{j} + c\hat{k})$ and $a^2 + b^2 + c^2 = 4$; and position vector of another point B is $(p\hat{i} + q\hat{j} + r\hat{k})$ and $p^2 + q^2 + r^2 = 9$. Given $\angle AOB = 2\cos^{-1}\frac{1}{5}$, where O is origin. If AQ is perpendicular to angle bisector of $\angle AOB$ i.e., line OQD where D lies on AB, then value of $25\left|\overrightarrow{QD}\right|$ is :

(A) 1 **(B)** 2 **(C)** 3 **(D)** 4

SECTION-2

ONE OR MORE THAN ONE CHOICE QUESTIONS

This section consists of 3 Multiple Correct Answers Type Questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE THAN ONE CHOICE** is correct.

5. A and B are two $n \times n$ matrices such that $\det(A) \neq 0,\ A+B=(AB)^2$ and $BAB=A+I.$ Choose the correct option(s).

(A) $A^{-1}=(A^4-I)$ **(B)** $B^5-A^5=A+B$

(C) $A^9=A^4+A+I$ **(D)** $A^2B^2=BA^2B$

6. Let $P(x)$ be a polynomial of degree *n* and $f(x)=\begin{cases} P\left(\frac{1}{x^3}\right)\cdot e^{\frac{-1}{x^4}}, & x\neq 0 \\ 0, & x=0 \end{cases}$, then:

(A) $f(x)$ is discontinuous at $x=0$ **(B)** $f(x)$ is continuous at $x=0$

(C) $f(x)$ is non differentiable at $x=0$ **(D)** $f'(0)=\lim\limits_{x\to 0} f(x)$

7. Let $f,g,h: R\to R\ ;\ f(x),g(x),h(x)$ are all continuous, differentiable functions which satisfy the relation $f(x+y)=g(x)+h(y)$ for all $x,y\in R$.

(A) $f'(0)=f'(1)$

(B) $g'(x)=h'(x)+1$

(C) $h(x)\neq g(x)\ \forall\ x\in R-\{0\}$ if $h(0)\neq g(0)$

(D) $f(0)=g(0)+h(0)$

SECTION-3

NON-NEGATIVE INTEGER TYPE QUESTIONS

This section consists of 6 NON-NEGATIVE INTEGER Type Questions. The answer to each question is a **NON-NEGATIVE INTEGER.** For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.

1. Minimum value of $\frac{3x^2+1}{\sqrt{x^4+x^2}}$ in $\left(0,\sqrt{2}\right]$ is *k*, then [*k*] is _____. ([.] denotes greatest integer function)

2. Let $y=f(x)$ be a function satisfying $-e^{-x^2}\frac{dy}{dx}=2xy^2$ such that $f(0)=\frac{1}{2}$. Then the maximum value of $12\,f(x)$ is _____.

3. Urn A contains four white balls and two red balls. Urn B contains three red balls and three black balls. An urn is randomly selected and then a ball inside of that urn is drawn. The process of selecting an urn and drawing out a ball is repeated, without replacing the first ball. Let *p* be the probability that the first ball drawn was red, given that the second ball drawn was black, then $15\,p$ equals _____.

4. Suppose *A* is a complex number and $n\in N,$ such that $A^n=(A+1)^n=1,$ then the least value of *n* is _____.

5. If there are three square matrices A, B, C of same order satisfying the equation $A^2 = A^{-1}$ and let $B = A^{2^n}$ and $C = A^{2^{(n-2)}}$. If $\det(B-C) = K$, then the value of K is _____.

6. A circle with centre in the first quadrant is tangent to $y = x+10$, $y = x-6$ and *Y*-axis. Let (p,q) be the centre of the circle. If the value of $(p+q) = a+b\sqrt{a}$, where $a,b \in N$, then the value of $|a-b|$ is _____.

SECTION-4

COMPREHENSION WITH NUMERICAL TYPE QUESTIONS

This section consists of 2 Paragraphs. Based on each paragraph, there are **TWO (02)** questions. The answer to each question is a **NUMERICAL VALUE.** For each question, enter the correct numerical value of the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer. If the numerical value has more than two decimal places, **truncate/round-off** the value to **TWO** decimal places

PARAGRAPH FOR Q-7 & 8

$(x+y)^n = {}^nC_0x^ny^0 + {}^nC_1x^{n-1}y^1 + {}^nC_2x^{n-2}y^2 + \ldots {}^nC_r \cdot x^{n-r} \cdot y^r + \ldots {}^nC_n \cdot x^0y^n$

For terms independent of any variable, the exponent of that variable is 0.

7. The term that is independent of *x*, in the expression $\left(\frac{3}{2}x^2 - \frac{1}{3x}\right)^9$ is ${}^9C_6\left(\frac{1}{n}\right)^3$. The value of *n* is _____.

8. For a positive integer n, if the expansion of $\left(\frac{5}{x^2} + x^4\right)^n$ has a term $(r+1)^{th}$ independent of *x*, then remainder when *n* is divided by *r* is _____.

PARAGRAPH FOR Q-9 & 10

Let S be the set of the first 21 natural numbers, then the probability of

9. Choosing $\{x,y\} \subseteq S$, such that $x^3 + y^3$ is divisible by 3, is P, then 18 P is _____.

10. Choosing $\{x,y,z\} \subseteq S$, such that x,y,z are in AP, is P, then 133 P is _____.

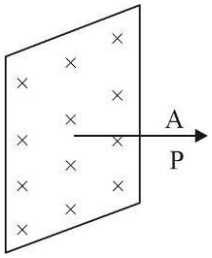
SUBJECT II : PHYSICS 60 MARKS

SECTION-1

SINGLE CHOICE QUESTIONS

This section consists of 4 Multiple Choice Questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE** is correct.

1. A short dipole having dipole moment $\vec{P}$ is placed at A nearby the surface of a non-conducting sheet of surface charge density (σ) such that area vector of sheet is parallel to dipole moment. It is found that equipotential spherical surface centered at the location of dipole having radius R exists in the space. Then σ of the sheet is:

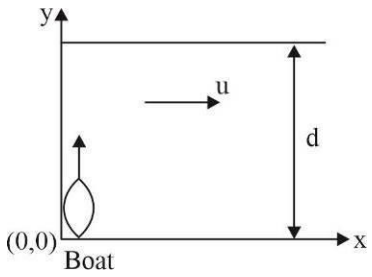


(A) $\frac{P}{8\pi R^3}$ **(B)** $\frac{P}{4\pi R^3}$ **(C)** $\frac{P}{\pi R^3}$ **(D)** $\frac{P}{2\pi R^3}$

2. A moving car experiences a force *F* due to air resistance. It is known that *F* depends on product of powers of its velocity *V*, its cross-sectional area A and the air density ρ and is given by $F = \frac{1}{2}C\rho^a V^b A^c$. *C* is a dimensionless constant. The values of *a*, *b* and *c*, respectively are:

(A) 1,1,2 **(B)** 2,1,1 **(C)** 1,2,1 **(D)** 2,2,1

3. A boat goes into river in direction perpendicular to flow of river. Velocity of river is given by equation: $\vec{u} = \left(\frac{u_0}{d^2}\right) y(d-y)(\hat{x})m/s$. Boat starts from rest from (0,0) as shown in figure. If the speed of boat along y-axis is increasing at the rate of $k\frac{m}{s^2}$. Find acceleration of boat at the instant when it crossed half of the width of river.



(A) $u_0\sqrt{\frac{k}{d}}(\hat{x}) + k(\hat{y})$ **(B)** $k(\hat{y})$ **(C)** $u_0\sqrt{\frac{k}{d}}(\hat{y})$ **(D)** $k(\hat{x}) + k(\hat{y})$

4. The mass $m = 14\,gm$ of nitrogen is enclosed in a vessel at a temperature T = 300 K, what amount of heat has to be transferred to the gas to increase the root mean square velocity of its molecules two times? [$Assume\ R = \frac{28}{3.5}\frac{J}{mol.K}$]

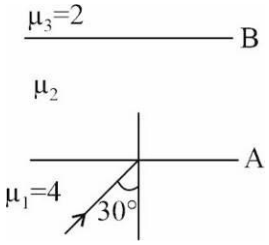
(A) 10 kJ **(B)** 9 kJ **(C)** 8 kJ **(D)** 15 kJ

SECTION-2

ONE OR MORE THAN ONE CHOICE QUESTIONS

This section consists of 3 Multiple Correct Answers Type Questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE THAN ONE CHOICE** is correct.

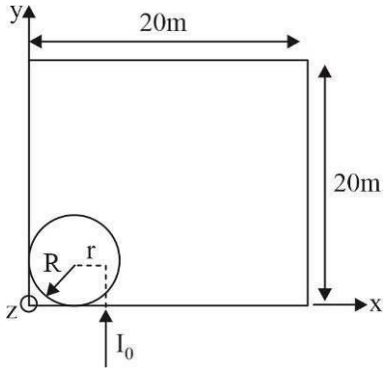
5. A light ray is incident on lower medium boundary at an angle 30° with the normal. Which of following statement is/are **correct**?



(A) If $\mu_2 > 2$ then total deviation is 60° **(B)** If $\mu_2 < 2$ then total deviation is 60°

(C) If $\mu_2 > 2$ then total deviation is 120° **(D)** If $\mu_2 < 2$ then total deviation is 120°

6. A large room of dimension $(20m \times 20m)$ has smooth floor and rough walls. A small disc of radius 2cm is located at one corner of room as shown in figure, mass of disc is 2kg. An impulse $I_0(\hat{y})$ is imparted on disc as shown. Assume all collision are elastic (e = 1) & neglect radius of disc w.r.t size of room. [Given : μ = coefficient of friction between wall and disc (1/4), $I_0 = 40$ N/s, r = 1cm, R = 2cm] (z-axis represents vertical direction). Which of the following options is/are correct.



(A) Total number of rotations made by disc till it return to same wall is $\frac{1000}{\pi}$

(B) Total number of rotations made by disc till it return to same wall is $\frac{500}{\pi}$

(C) Total distance travelled by centre of disc is 40 m

(D) Total distance travelled by centre of disc is $10(2+\sqrt{5})m$

7. A $1000W$ bulb is kept at the centre of a spherical surface and is at a distance of 10m from the surface. Which of the following option(s) is(are) correct at the spherical surface? (Take the working efficiency of the bulb to be 2.5% and consider it as point source).

(A) Intensity is nearly $0.02\frac{W}{m^2}$ **(B)** $E_0 = 3.86\frac{V}{m}$

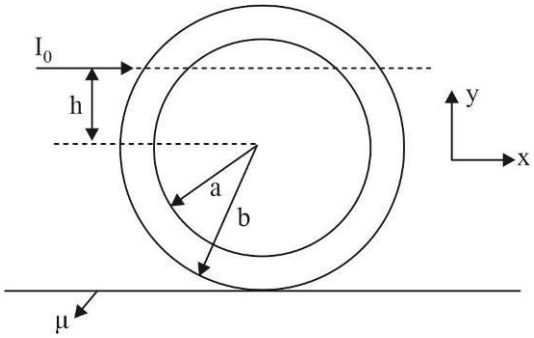
(C) Energy incident per second is 25 J **(D)** B_{rms} is $9.13\times10^{-9}T$

SECTION-3

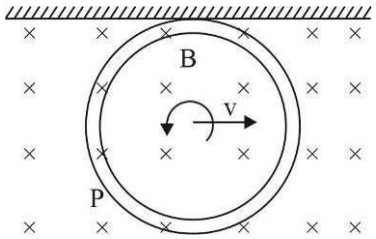
NON-NEGATIVE INTEGER TYPE QUESTIONS

This section consists of 6 NON-NEGATIVE INTEGER Type Questions. The answer to each question is a **NON-NEGATIVE INTEGER.** For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.

1. An annular sphere of mass *m*, inner radius *a* & outer radius *b* is placed on a horizontal surface with coefficient of friction μ as shown in figure. At some time, an impulse $I_0(\hat{x})$ is applied at a height h above the centre of the sphere. If $h = h_0$ then disk doesn't experience any friction force acting on it. The value of $h_0 = \frac{n}{5b}\left(\frac{b^5 - a^5}{b^3 - a^3}\right)$. Find value of *n*.



2. A rigid ring is made to roll along the ceiling of a room, where exists a uniform horizontal magnetic field of induction *B* perpendicular to the plane of the ring. The velocity of the centre of the ring is constant and its modulus is *v*. A charged particle P of mass m is fixed on the ring. The charge *q* on the particle is $\frac{kmg}{Bv}$ so that there is no force of interaction between the ring and the particle, then find the value of *k*.



3. How long will it take for the sound wave to travel the distance 310m between two points A and B, if the air temperature between them varies linearly from 225 K to 256 K? The velocity of sound propagation in air is equal to $V = \alpha\sqrt{T}$, where $\alpha = 10$ SI units.

4. When a vertical capillary of length *l* with the sealed upper end, its lower end was brought in contact with the surface of a liquid, the level of this liquid rose to the height $h = \frac{l}{2}$. The liquid density is ρ, The inside diameter of the capillary is *d*, the contact angle is θ, atmospheric pressure is P_0. The surface tension of liquid $T = \left(\frac{d}{n\cos\theta}\right)P_0$, if $\rho gl = 2P_0$. Then the value of *n* would be _____.

5. The activity of a radioactive sample goes down to about 6.25% in a time of 2 hours. Find the half-life of sample in minutes.

6. A galvanometer together with an unknown resistance in series is connected across two identical batteries each of 3V. When the batteries are connected in series, the galvanometer records a current of 1A, when the batteries are in parallel the current is 0.6A. The internal resistance of the battery is $\frac{a}{b}$.

Find *ab*. (here *a* and *b* are prime numbers)

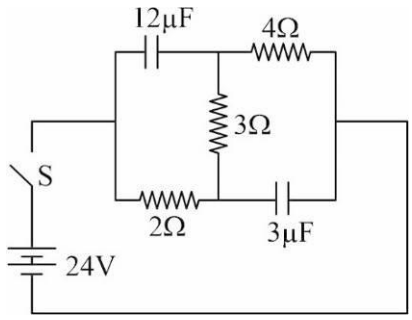
SECTION-4

COMPREHENSION WITH NUMERICAL TYPE QUESTIONS

This section consists of 2 Paragraphs. Based on each paragraph, there are **TWO (02)** questions. The answer to each question is a **NUMERICAL VALUE.** For each question, enter the correct numerical value of the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer. If the numerical value has more than two decimal places, **truncate/round-off** the value to **TWO** decimal places

PARAGRAPH FOR Q-7 & 8

The following two questions refer to the circuit shown. Assume that the capacitors are initially uncharged. At time $t = 0$, the switch S in the circuit is closed. At that instant the equivalent resistance of the circuit is k ohm. After the switch has been closed for a long time, $p\ \mu C$ charge is present on the positive plate of the $3\,\mu F$ capacitor.

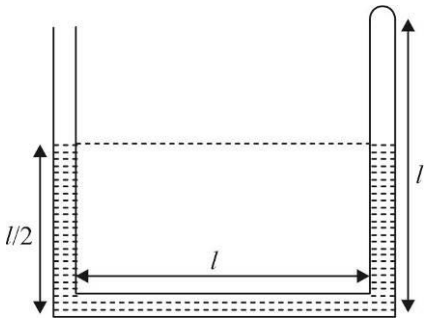


7. The value of k is _____.

8. The value of p is _____ .

PARAGRAPH FOR Q-9 & 10

A rectangular narrow U-tube has equal arm lengths and base length, each equal to *l*. The vertical arms are filled with mercury up to *l*/2 and then one end is sealed. By heating the enclosed gas all the mercury is expelled. If atmospheric pressure is P_0, the density of mercury is ρ and cross-sectional are is *A*, then [Neglect thermal expansion of glass and mercury]



9. The work done by the gas against the atmospheric pressure is $\left(\frac{x}{2}\right)P_0Al$, find value of *x*.

10. The work done by the gas against gravity is $\left(\frac{y}{4}\right)A\rho gl^2$, find value of *y*.

SUBJECT III : CHEMISTRY 60 MARKS

SECTION-1

SINGLE CHOICE QUESTIONS

This section consists of 4 Multiple Choice Questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONLY ONE CHOICE** is correct.

1. The molecular orbital configuration of CN^+ is :

(A) $\sigma(1s)^2, \sigma^*(1s)^2, \sigma(2s)^2, \sigma^*(2s)^2, \pi(2p_x)^2, \pi(2p_y)^2$

(B) $\sigma(1s)^2, \sigma^*(1s)^2, \sigma(2s)^2, \sigma^*(2s)^2, \sigma(2p_z)^2, \pi(2p_x)^1, \pi(2p_y)^1$

(C) $\sigma(1s)^2, \sigma^*(1s)^2, \sigma(2s)^2, \sigma^*(2s)^2, \sigma(2p_z)^1, \pi(2p_x)^2, \pi(2p_y)^1$

(D) $\sigma(1s)^2, \sigma^*(1s)^2, \sigma(2s)^2, \sigma^*(2s)^2, \sigma(2p_z)^2, \pi(2p_x)^2$

2. The characteristic property(ies) of Lyophobic sol is/are

I. It can be easily coagulated than Lyophilic colloids

II. It shows more prominent tyndall effect than Lyophilic colloid

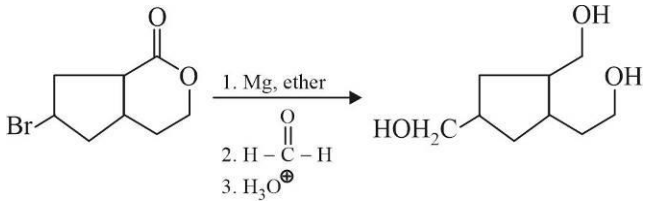
III. It is thermodynamically more stable than Lyophilic colloid

IV. The dispersed phase has lower affinity for dispersion medium than that of Lyophilic colloids

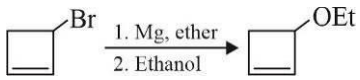
(A) I and III **(B)** I, II and III **(C)** III and IV **(D)** I, II and IV

3. Which of the following is a correct conversion?

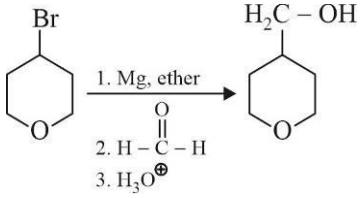
(A)



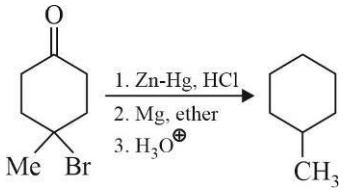
(B)



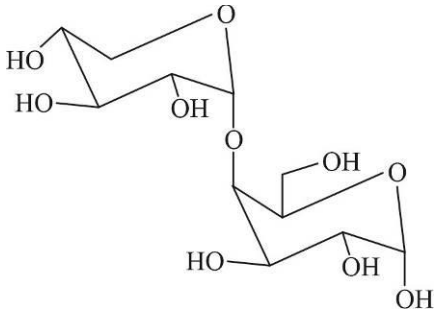
(C)

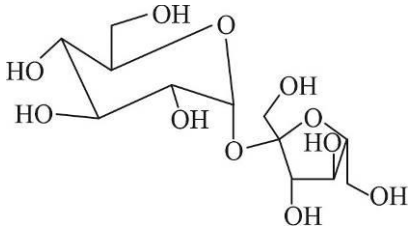


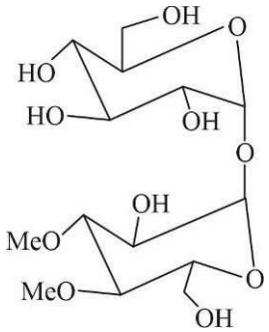
(D)

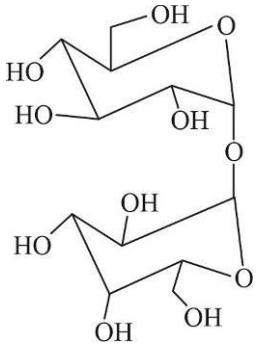


4. A disaccharide does NOT give a positive test for Tollen's reagent. Upon acidic hydrolysis, it gives an equimolar mixture of two different monosachharides, both of which can be oxidized by bromine water. The correct structure of disaccharide is :

(A) 

(B) 

(C) 

(D) 

SECTION-2

ONE OR MORE THAN ONE CHOICE QUESTIONS

This section consists of 3 Multiple Correct Answers Type Questions. Each question has 4 choices (A), (B), (C) and (D), out of which **ONE OR MORE THAN ONE CHOICE** is correct.

5. The complex(es) which can exhibit the type of isomerism shown by $[Co(en)_3]^{+3}$ is(are):

$[en = H_2N - CH_2 - CH_2 - NH_2]$

(A) $[Co(NH_3)_3Cl_3]$ (mer) **(B)** $[Cr(C_2O_4)_3]^{-3}$

(C) $[Pt(Cl_2)en_2]^{2+}$ (cis) **(D)** $[PtCl_2(en)_2]^{2+}$(trans)

6. A quantity of 80.0 g of a salt (XY) of strong acid and weak base is dissolved in water to form 2.0 L aqueous solution. At 298 K, the pH of the solution is found to be 5.0. If XY forms CsCl type crystal and the radius of X^+ and Y^- ions are 160 pm and 186.4 pm, respectively, then the correct information is: (Given : K_b of $XOH = 4\times10^{-5}$, $N_A = 6\times10^{23}$, $\sqrt{3} = 1.732$)

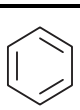
(A) Molar mass of the salt is 100 g/mol

(B) The degree of hydrolysis of salt is 2.5×10^{-5}

(C) Unit cell edge length of XY crystal is 400 pm

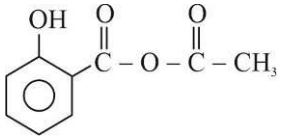
(D) Density of solid XY is $2.6\,g/cm^3$

7. Choose the correct option(s) for the following reaction sequence:


(i) $CH_2 - CH = CH_2/H_3PO_4, \Delta$
(ii) O_2
(iii) $H^{\oplus}/H_2O$
(iv) NaOH
(v) CO_2, 4-7 atm
(vi) HCl
→ P (Major) $\xrightarrow{Ac_2O/H^{\oplus}}$ Q + CH_3COOH

(A) Compound Q has antipyretic action

(B) Compound P gives test with neutral ferric chloride

(C) Compound Q is 

(D) Compound P can also be prepared by reaction of salicylaldehyde with Tollen's solution followed by acidification

SECTION-3

NON-NEGATIVE INTEGER TYPE QUESTIONS

This section consists of 6 NON-NEGATIVE INTEGER Type Questions. The answer to each question is a **NON-NEGATIVE INTEGER.** For each question, enter the correct integer corresponding to the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer.

1. One mole of P_4 reacts with $SOCl_2$ to give x moles of PCl_3, y moles of SO_2 and z moles of A. The value of $x + y + z$ is _____.

2. Among SiF_4, BeH_2, NF_3, H_2O, BF_3, SiO_2, NH_2^-, O_3, SO_3, XeO_3, $[Cu(NH_3)_4]^{2+}$, $N(SiH_3)_3$ the total number of species having sp^3 hybridized central atom is _____?

3. Consider the following molecules CrO_5, Cl_2O_7, $H_2S_2O_8$ and H_2SO_5. The sum of the number of atoms existing in +6 oxidation state in all molecules is _____.

4. The atomic number of hydrogen-like ion having the wavelength difference between the first line of Balmer and Lyman series equal to 88/(135R) is _____.

5. Solutions A and B have osmotic pressures of 2.4 atm and 4.2 atm respectively at a certain temperature. The osmotic pressure (in atm) of a solution prepared by mixing the solutions in 2 : 1 volume ratio respectively at the same temperature is _____.

6. C_6H_8 (anti aromatic) $\xrightarrow{O_3,\,(CH_3)_2S}$ B (Only product) $\xrightarrow{\text{Tollen's reagent}}$ C $\xrightarrow{NaBH_4}$ D (Optically active)

The value of $\sqrt{\frac{M_0}{10}}$ is _____. (where M_0 is the molecular weight of D)

SECTION-4

COMPREHENSION WITH NUMERICAL TYPE QUESTIONS

This section consists of 2 Paragraphs. Based on each paragraph, there are **TWO (02)** questions. The answer to each question is a **NUMERICAL VALUE.** For each question, enter the correct numerical value of the answer using the mouse and the onscreen virtual numeric keypad in the place designated to enter the answer. If the numerical value has more than two decimal places, **truncate/round-off** the value to **TWO** decimal places

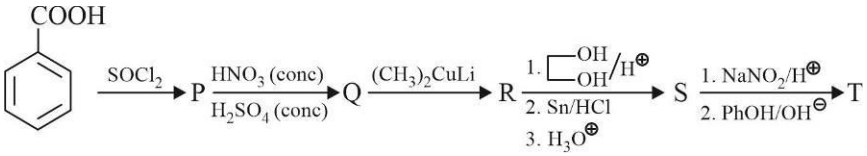
PARAGRAPH FOR Q-7 & 8

A reversible cyclic process involves 6 steps. In step-1 and 3, the system absorbs 500 J and 800 J of heat from a heat reservoir at temperature 250 K (T_1) and 200 K (T_3) respectively. Step-2, 4 and 6 are adiabatic such that the temperature of one reservoir changes to that of next. Total work done by the system in whole process is 700 J.

7. If sum of entropy change during steps-1, 3 and 5 be x J/K then the value of $\left(\frac{x+4}{5}\right)$ is _____.

8. If during step-5, the system exchanges heat from a reservoir at temperature T_5 K, then value of $\frac{T_1}{T_5}\times 10$ is _____.

PARAGRAPH FOR Q-9 & 10



9. The number of π-bonds in a molecule of T is _____.

10. The molecular weight of compound S is _____.