

JEE(ADVANCED)–2026 (EXAMINATION)

(Held On Sunday 17th MAY, 2026)

CHEMISTRY

TEST PAPER WITH SOLUTION

PAPER-2

SECTION-1 : (Maximum Marks : 12)

- This section contains **FOUR (04)** 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.

1. At 300 K, the molar conductivities of the aqueous solutions of three salts at two different concentrations are given below :

Salt	Concentration (M)	Molar conductivity ($S\text{ cm}^2\text{ mol}^{-1}$)
NaNO ₃	0.01	111
	0.04	101
NaCl	0.01	117
	0.04	107
AgNO ₃	0.01	125
	0.04	116

The conductivity of a saturated aqueous solution of AgCl is $1.40 \times 10^{-6} S\text{ cm}^{-1}$ at 300 K. If the solubility of AgCl in water at 300 K is $X\text{ mol L}^{-1}$, then $\log_{10}(X^{-1})$ is
 (Assume that AgCl dissolved in water ionizes completely and that the molar conductivity of saturated AgCl solution is equal to its limiting molar conductivity.)

- (A) 3 (B) 4 (C) 5 (D) 6

Ans. (C)

Sol. For NaNO₃

$$111 = -b\sqrt{0.01} + \Lambda_m^\circ$$

$$111 = -0.1b + \Lambda_m^\circ \dots\dots\dots(i)$$

$$101 = -b\sqrt{0.04} + \Lambda_m^\circ$$

$$101 = -0.2b + \Lambda_m^\circ \dots\dots\dots(ii)$$

$$\Lambda_{m(\text{NaNO}_3)}^\circ = 121\text{ Scm}^2\text{mol}^{-1}$$

For NaCl

$$117 = -0.1b + \Lambda_m^\circ$$

$$107 = -0.2b + \Lambda_m^\circ$$

$$\Lambda_{m(\text{NaCl})}^\circ = 127 \text{ Scm}^2\text{mol}^{-1}$$

For AgNO₃

$$125 = -0.1b + \Lambda_m^\circ$$

$$116 = -0.2b + \Lambda_m^\circ$$

$$\Lambda_{m(\text{AgNO}_3)}^\circ = 134 \text{ Scm}^2\text{mol}^{-1}$$

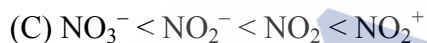
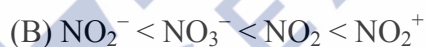
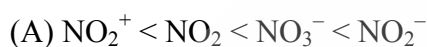
$$\Lambda_{m(\text{AgCl})}^\circ = 127 + 134 - 121 = 140$$

$$140 = \frac{1.40 \times 10^{-6} \times 1000}{S}$$

$$X = S = 10^{-5} \text{ M}$$

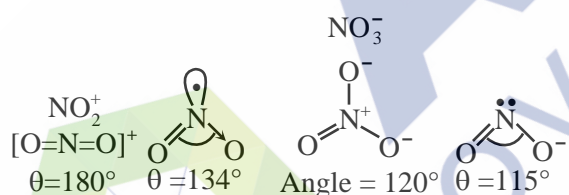
$$\log_{10} X = 5$$

2. The correct order of ONO bond angle in the given species is :

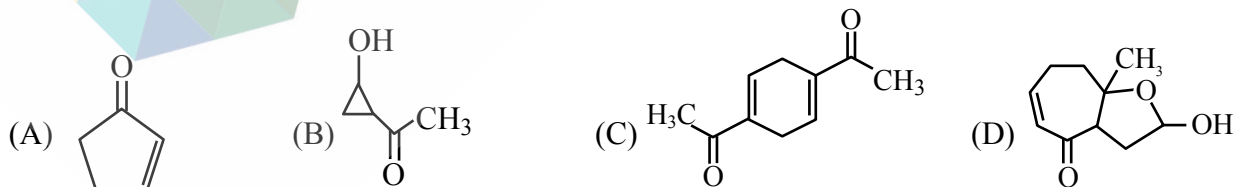


Ans. (B)

Sol.

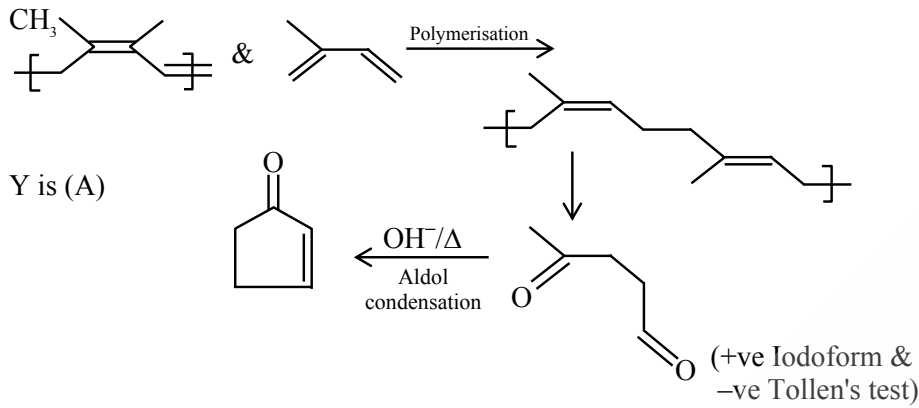


3. Natural rubber on complete ozonolysis ($\text{O}_3/\text{Zn-H}_2\text{O}$) gives compound X as the major product. X gives positive iodoform and Tollen's tests. X on heating with aqueous NaOH gives Y as the major product. Y is

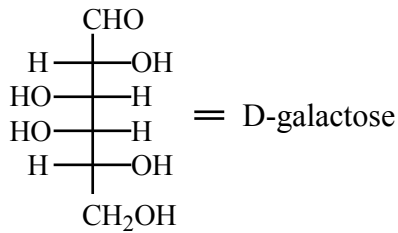


Ans. (A)

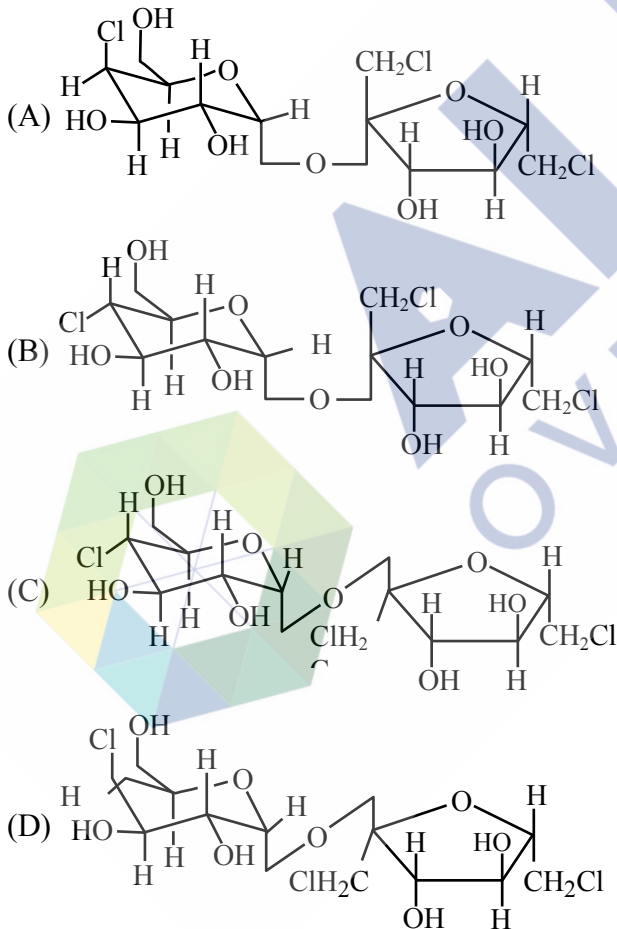
Sol.



4. A known artificial sweetener **X** is composed of 4-chloro-4-deoxy- α -D-galactose and 1,6-dichloro-1,6-dideoxy- β -D-fructose joined by a glycosidic linkage. Structure of D-galactose is given below:

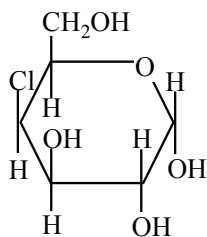


The correct structure of **X** is :

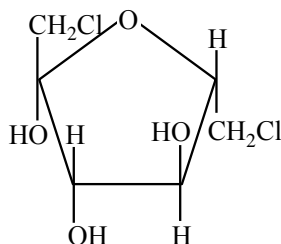


Ans. (A)

Sol.

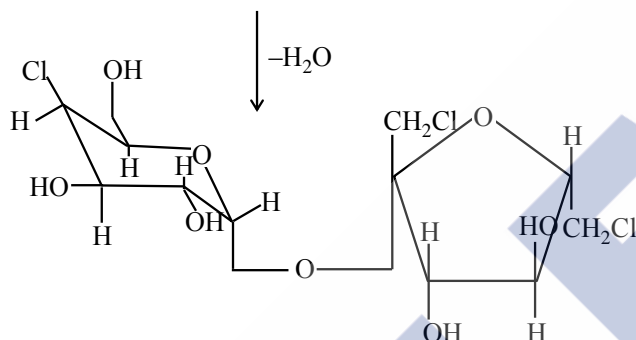


+



4-Chloro-4-deoxy- α -D-galactose

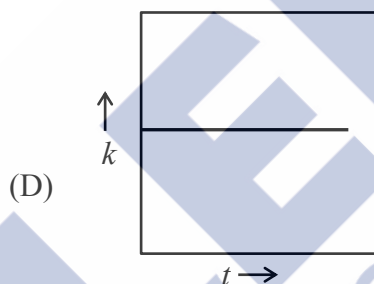
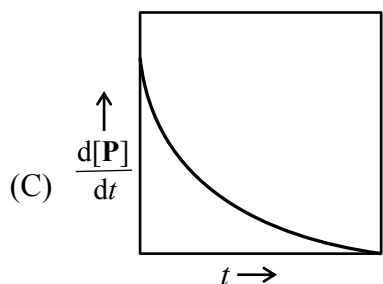
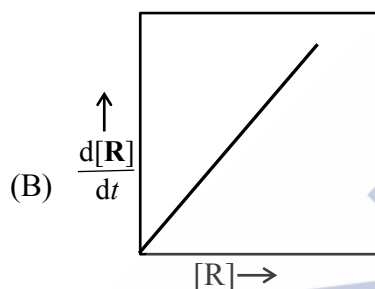
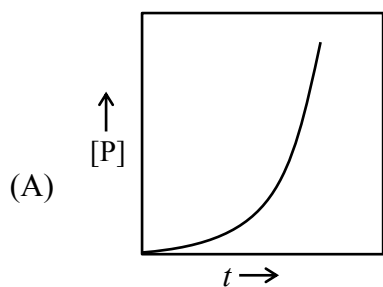
1,6-dichloro-1,6-dideoxy- β -D-fructose



SECTION-2 : (Maximum Marks : 20)

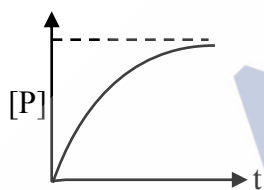
- This section contains **FIVE (05)** questions.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- For each question, choose the option(s) corresponding to (all) the correct answer(s).
- Answer to each question will be evaluated **according to the following marking scheme:**
 - Full Marks* : +4 **ONLY** if (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, 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 Marks* : 0 If none of the options is chosen (i.e. the question is unanswered);
 - Negative Marks* : -1 In all other cases.
- For example, in a question, if (A), (B) and (D) are the **ONLY** three options corresponding to correct answers, then
 - choosing **ONLY** (A), (B) and (D) will get +4 marks;
 - choosing **ONLY** (A) and (B) will get +2 marks;
 - choosing **ONLY** (A) and (D) will get +2 marks;
 - choosing **ONLY** (B) and (D) will get +2 marks;
 - choosing **ONLY** (A) will get +1 marks;
 - choosing **ONLY** (B) will get +1 marks;
 - choosing **ONLY** (D) will get +1 marks;
 - choosing no option (i.e. the question is unanswered) will get 0 marks ; and
 - choosing any other combination of option(s) will get -1 marks.

5. For a first-order reaction $\mathbf{R} \rightarrow \mathbf{P}$ at a given temperature, k is the rate constant. For this reaction, at the given temperature, the concentrations of \mathbf{R} and \mathbf{P} at a time t are $[\mathbf{R}]$ and $[\mathbf{P}]$, respectively. The correct graphical representation(s) for this reaction is(are)

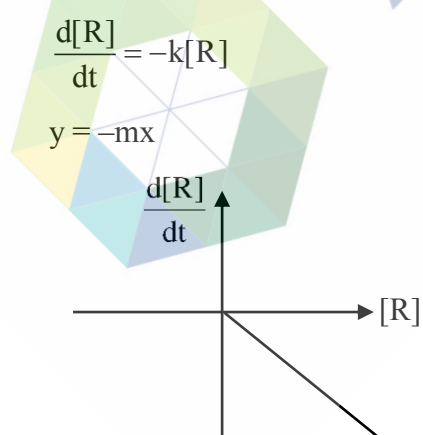


Ans. (C,D)

Sol. (A) $[P]_t = [R]_0 (1 - e^{-kt})$

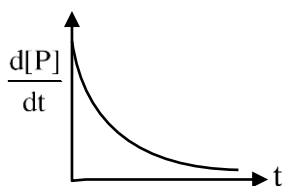


(B) Rate = $\frac{-d[\mathbf{R}]}{dt} = k[\mathbf{R}]$

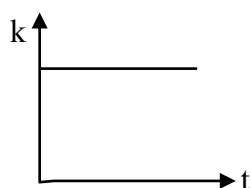


$$(C) \text{ Rate} = \frac{-d[R]}{dt} = \frac{d[P]}{dt} = k[R]$$

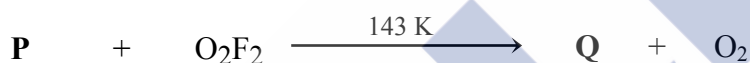
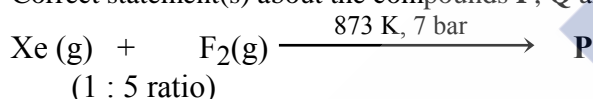
$$\text{So, } \frac{d[P]}{dt} = k[R]_0 e^{-kt}$$



(D) $k = \text{constant}$

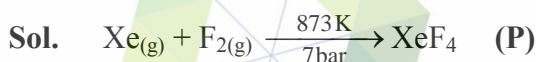


6. Correct statement(s) about the compounds **P**, **Q** and **R** is(are)

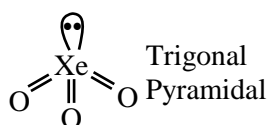
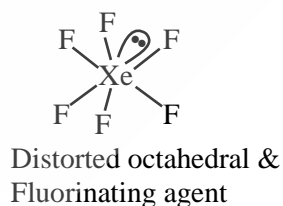
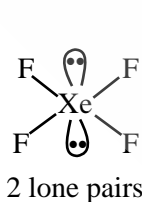


- (A) **P** has two lone pairs of electrons on the central atom.
- (B) **Q** has a perfect octahedral geometry.
- (C) **Q** can act as a fluorinating agent.
- (D) The molecular structure of **R** is trigonal pyramidal.

Ans. (A, C, D)



1 : 5



7. The correct statement(s) regarding the periodic properties of elements is (are)
- (A) Second ionization enthalpy of carbon atom is less than that of boron atom
- (B) Increasing order of ionic radii: $\text{Al}^{3+} < \text{Mg}^{2+} < \text{Na}^+$
- (C) Under identical conditions, in solid state, the density of potassium metal is more than density of sodium metal
- (D) The H–H bond is weaker than F–F bond.

Ans. (A, B)

Sol. 2nd 1E order : B > C

Ionic Radius : $\text{Na}^+ > \text{Mg}^{2+} > \text{Al}^{3+}$

(In isoelectronic species, as $Z \uparrow$; size \downarrow)

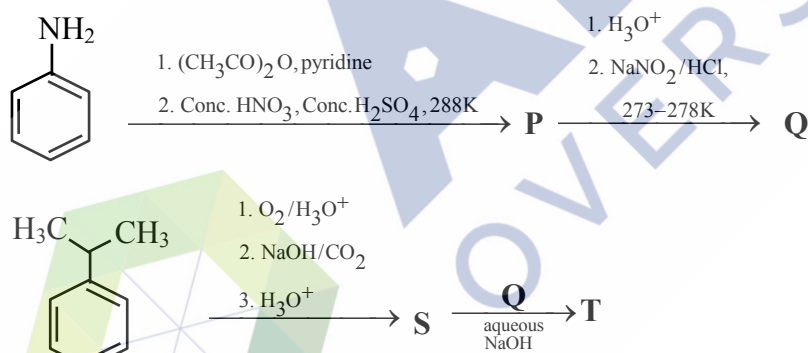
(density)_{Na} > (density)_K

Bond dissociation energy

H–H > F–F

435.8 kJ/mol 158.8 kJ/mol

8. In the following reaction sequence, P, Q, S and T are the major products.

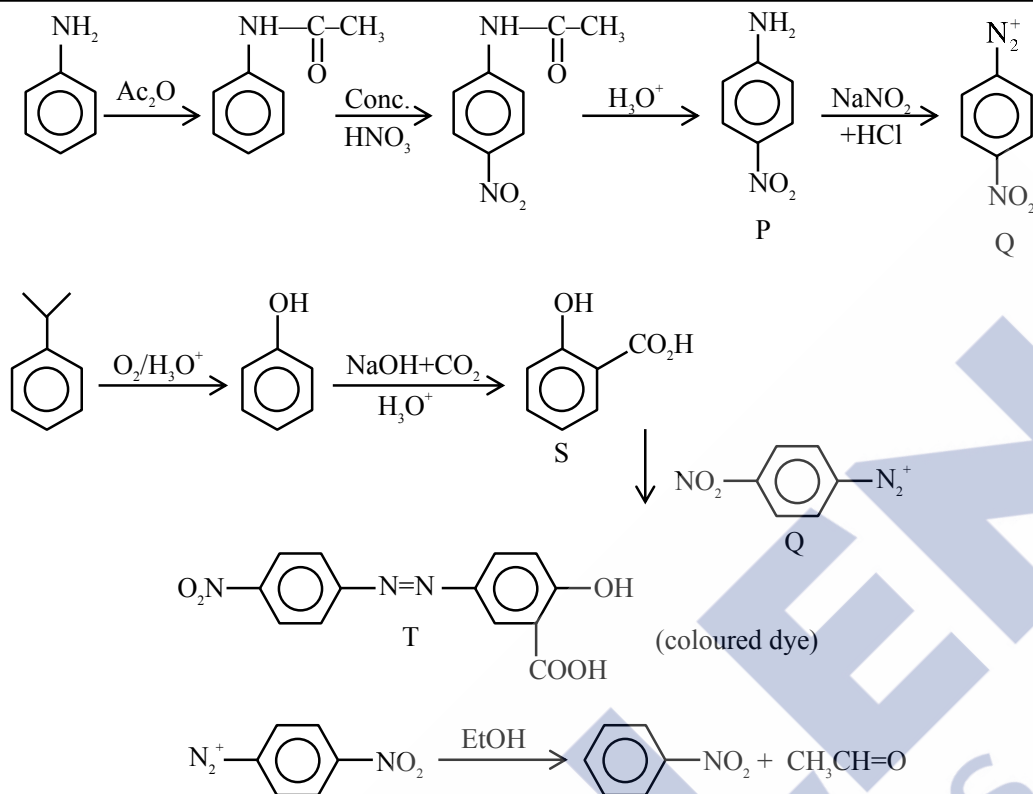


The correct statement(s) about P, Q, S and T is (are)

- (A) Q on treatment with ethanol generates an aromatic aldehyde.
- (B) S gives positive phthalein dye test
- (C) P is a dinitro compound
- (D) T is a coloured compound

Ans. (B, D)

Sol.



S gives positive phthalein dye test because it is phenol derivative.

P is mononitro product

T is coloured dye compound.

9. The correct statement(s) regarding sugars is (are)

Given : Specific rotations of L-(–)-glucose and L-(+)-fructose are -52.5° and $+92.5^\circ$, respectively.

- (A) On treatment with HNO_3 , gluconic acid is oxidized to saccharic acid, whereas glucose is not oxidized to saccharic acid
- (B) Fructose gives a positive Fehling's test because it isomerises to glucose and another aldohexose in the presence of Fehling's reagent
- (C) Invert sugar is an equimolar mixture of D-glucose and D-fructose formed after hydrolysis of the corresponding disaccharide
- (D) Specific rotation of invert sugar is -40°

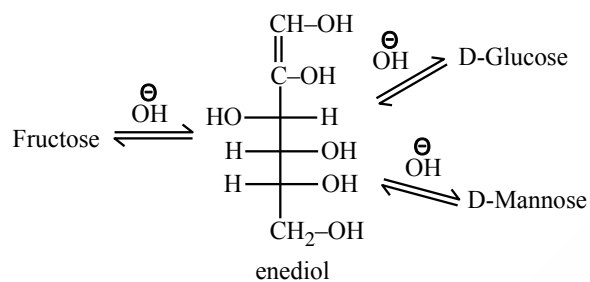
Ans. (B, C)

Sol. **Option (A)**

Gluconic acid or Glucose $\xrightarrow{\text{HNO}_3}$ Saccharic acid

Both gluconic acid & glucose oxidized to saccharic acid.

Option (B)



Fructose tautomerise in D-glucose & D-mannose in basic medium.

So fructose gives +ve Fehling test because Fehling solution has basic medium (dil NaOH)

Option (C)

Acidic hydrolysis of sucrose gives D-glucose & D-fructose (i.e. Invert sugar) in 1 : 1 ratio.

Option (D)

Specific rotation of invert sugar is -20°



SECTION-3 : (Maximum Marks : 20)

- This section contains **FIVE (05)** questions.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value corresponding to the answer in the designated place using the mouse and the on-screen virtual numeric keypad.
- 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 : +4 If **ONLY** the correct numerical value is entered in the designated place;

Zero Marks : 0 In all other cases.

10. X^{a+} and Y^{b+} are hydrogen-like species. The wavelength of light absorbed during the transition between the states with principal quantum numbers $n = 1$ and $n = 2$ of X^{a+} is λ . The wavelength of light absorbed during the transition between the states with principal quantum numbers $n = 2$ and $n = 4$ of Y^{b+} is 9λ . The lowest possible value of $(a+b)$ is _____.

Ans. (3.00)

Sol.
$$\frac{1}{\lambda} = R_H Z^2 \left[\frac{1}{n_1^2} - \frac{1}{n_2^2} \right]$$

For $X^{a+} = \frac{1}{\lambda} = R_H (z_x)^2 \left\{ \frac{1}{1^2} - \frac{1}{2^2} \right\}$ (1)

For $Y^{b+} = R_H (z_y)^2 \left\{ \frac{1}{2^2} - \frac{1}{4^2} \right\}$ (2)

Equation (1) \div Equation (2)

$$9 = \frac{z_x^2}{z_y^2} \times \frac{3/4}{3/16}$$

$$\frac{z_x^2}{z_y^2} = \frac{9}{4}$$

$$\frac{z_x}{z_y} = \frac{3}{2}$$

For minimum values = $z_x = 3, z_y = 2$

X^{a+} and Y^{b+} are hydrogen like species.

So a should be 2 & b should be 1.

Lowest possible value of $a + b = 2 + 1 = 3$

11. At a given temperature, 0.45 g of acetic acid in 50 mL of water is shaken with 1.0 g of charcoal and the pH of the resulting solution is 3.0. Assume, the adsorption of acetic acid from the aqueous solution by charcoal follows Freundlich isotherm,

$$\frac{x}{m} = kC^{1/n}$$

If the plot of $\log_{10}(x/m)$ against $\log_{10}C$ gives a straight line with slope 1, the value of k in L mol^{-1} is _____.

Given: The molar mass of acetic acid is 60 g mol^{-1} .

The acid dissociation constant of acetic acid is 1.0×10^{-5} at the given temperature.

x is the mass (in grams) of acetic acid adsorbed.

m is the mass (in grams) of charcoal

C is the equilibrium concentration of acetic acid in the solution after the adsorption is complete.

k and n are constants for acetic acid-charcoal system at the given temperature.

Ans. (1.50)

Sol. Initial moles of $\text{CH}_3\text{COOH} = \frac{0.45}{60} = 0.0075$

Initial molarity of $\text{CH}_3\text{COOH} = \frac{0.0075}{50} \times 1000 = 0.15 \text{ M}$

After adsorption given $\text{pH} = 3 \Rightarrow [\text{H}^+] = 10^{-3} \text{ M}$

$\text{CH}_3\text{COOH}(\text{aq}) \rightleftharpoons \text{CH}_3\text{COO}^-(\text{aq}) + \text{H}^+(\text{aq})$

$$K_a = 1.0 \times 10^{-5} = \frac{10^{-3} \times 10^{-3}}{C - 10^{-3}}$$

$C = 0.1 \text{ M}$

Adsorbed mass of CH_3COOH on 1 g charcoal = $\frac{(0.15 - 0.1) \times 50 \times 60}{1000} = 0.15 \text{ g}$

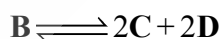
$$\log \frac{x}{m} = \log K + \frac{1}{n} \log C$$

$$\log 0.15 = \log K + 1 \times \log 0.1$$

$$\log 1.5 = \log K$$

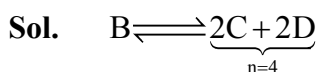
$$K = 1.5$$

12. In a solvent **S**, a compound **B** is partially dissociated into **C** and **D** as given below :



B, **C** and **D** are non-volatile in nature. The molar mass of **B** is 10 times the molar mass of **S**. The standard boiling point and the standard enthalpy of vaporization of **S** are 400 K and $10R \text{ J mol}^{-1}$, respectively (R is the gas constant in $\text{J K}^{-1} \text{ mol}^{-1}$). A solution of **B** in **S** with an initial concentration of **B** as 0.25% (mass/mass) has a boiling point of 408 K at 1 bar pressure. In this solution, the mole percent of **B** that has been dissociated is _____.

Ans. (33.16 or 33.17)



$$i = 1 + (4 - 1) \alpha$$

$$i = 1 + 3\alpha$$

B is 0.25% $\frac{\text{Mass}}{\text{Mass}} \Rightarrow 100 \text{ g solution contain } 0.25 \text{ g of B}$

$$\text{Molality} = \frac{\frac{0.25}{M_B}}{99.75} \times 1000 = \frac{1000}{399 M_B}$$

Elevation of B.P. = 408 - 400 = 8 K

$$(K_b) = \frac{R(T_b^\circ)^2 M}{1000 \Delta H_{\text{vap}}} = \frac{R \times (400)^2 \times M_S}{1000 \times 10R}$$

$$K_b = 16 M_S$$

$$\Delta T_b = i \times K_b \times m$$

$$8 = (1 + 3\alpha) \times 16 M_S \times \frac{1000}{399 M_B}$$

$$\therefore M_B = 10 M_S$$

$$8 = (1 + 3\alpha) \times 16 M_S \times \frac{1000}{399 \times 10 M_S}$$

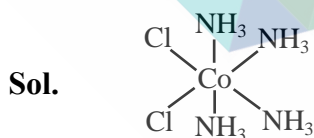
$$1.995 = 1 + 3\alpha$$

$$\alpha = 0.3316666 \dots$$

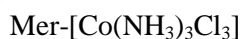
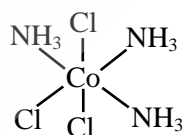
$$\% \alpha = 33.1666 \dots$$

13. Consider that the coordinating atoms of the ligands in *cis*-[Co(NH₃)₄Cl₂]Cl and *mer*-[Co(NH₃)₃Cl₃] octahedral complexes are at the vertices of an octahedron. The sum of total number of the triangular faces in both the complexes having one N atom and two Cl atoms at their corners is ____.

Ans. (6.00)



Two triangular faces having one N & two Cl atoms.



4 triangular faces having one N & two Cl atoms.

SECTION-4 : (Maximum Marks : 8)

- This section contains **TWO (02)** question stems.
- There are **TWO (02)** questions corresponding to each question stem.
- The answer to each question is a **NUMERICAL VALUE**.
- For each question, enter the correct numerical value corresponding to the answer in the designated place using the mouse and the on-screen virtual numeric keypad.
- 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 : +2 If **ONLY** the correct numerical value is entered in the designated place;

Zero Marks : 0 In all other cases.

Question Stem for Question Nos. 15 and 16

Two volatile liquids **A** and **B** form an ideal solution. Consider a 5 molal solution of **B** in **A** inside a closed container having a total vapour pressure of 100 mm Hg at 300 K. The vapour pressure of pure **A** at 300K is 105 mm Hg. Assume that **A** and **B** behave as ideal gases in the vapour phase.

Given:

The gas constant $R = 0.08 \text{ L atm K}^{-1} \text{ mol}^{-1}$

Molar mass of **A** is 50 g mol^{-1}

Molar mass of **B** is 57 g mol^{-1}

Density of liquid **B** at 300 K is 0.5 g/mL

$1 \text{ atm} = 760 \text{ mm Hg}$

15. At 300 K, the ratio of the molar volume of pure **B** in vapour phase to its molar volume in liquid phase is _____.

Ans. (2000.00)

Sol.
$$P_T = X_A P_A^\circ + X_B P_B^\circ$$

$$100 = \frac{\frac{1000/50}{\frac{1000}{50} + 5}}{\frac{1000}{50} + 5} (105) + \frac{5}{\frac{1000}{50} + 5} (P_B^\circ)$$

$$P_B^\circ = 80 \text{ mm of Hg}$$

Molar volume of vapour of **B**

$$V_m = \frac{RT}{P} = \frac{0.08 \times 300}{80/760}$$

$$V_m = 228 \text{ lit/mol}$$

Molar volume of B in liquid phase

$$V'_m = \frac{57}{0.5} = 114 \text{ ml/mol}$$

$$\text{Ratio} = \frac{\text{molar volume in vapour}}{\text{molar volume in liquid}}$$

$$= \frac{228 \times 1000}{114} = 2000$$

16. The mole fraction of B in vapour phase which is in equilibrium with this solution is _____.

Ans. (0.16)

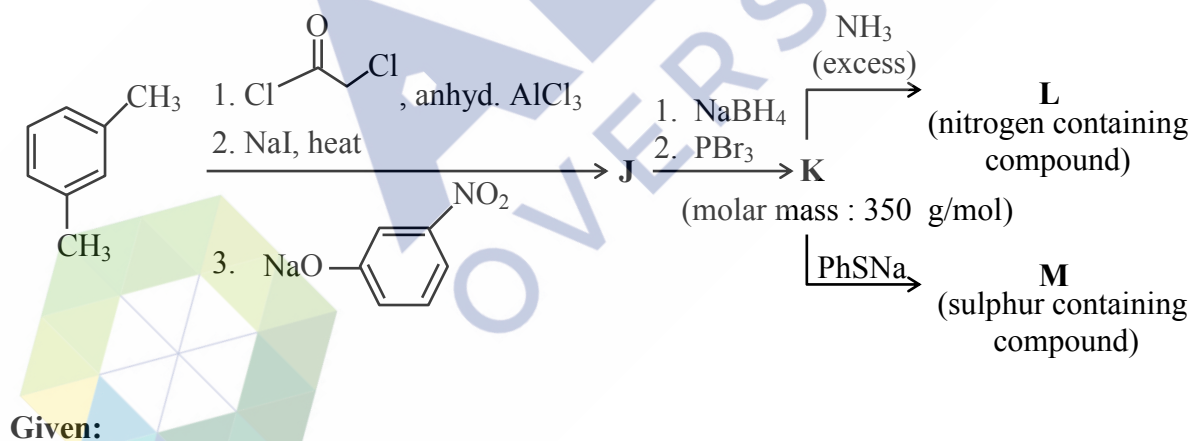
Sol. $P_B = x_B P_B^\circ$

$$P_B = 0.2 \times 80 = 16$$

$$y_B = \frac{P_B}{P_T} = \frac{16}{100} = 0.16$$

Question Stem for Question Nos. 17 and 18

Consider the following reaction sequence in which J, K, L and M are the major products.



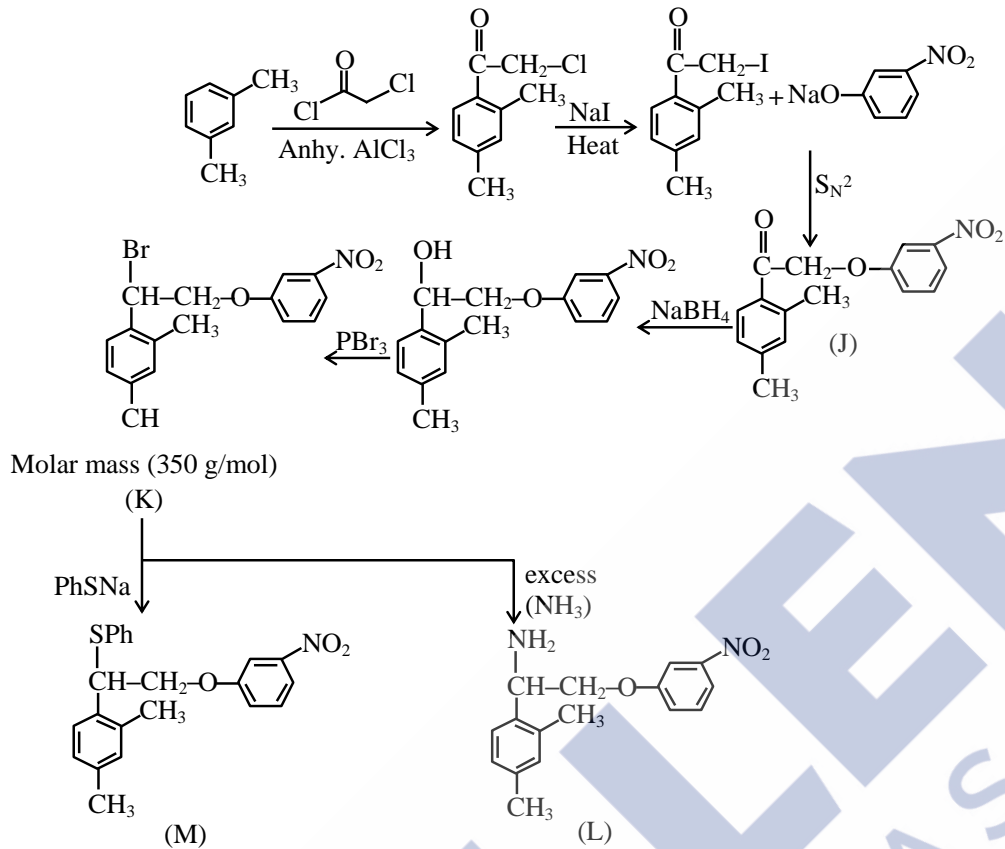
Given:

Atomic mass (in amu): H : 1, C : 12, N : 14, O : 16, S : 32, Br : 80, Ba : 137

17. The volume of 1 M aqueous H_2SO_4 required to completely neutralize the ammonia evolved from 5.72 g of L in Kjeldahl's method of nitrogen estimation is _____ mL.

Ans. (10.00)

Sol.



$$286 \text{ gm L requires} = \frac{1}{2} \text{ mole H}_2\text{SO}_4$$

$$572 \text{ gm L requires} = 1 \text{ mole H}_2\text{SO}_4$$

$$\text{Hence } 5.72 \text{ gm of L} = 0.02 \text{ mole of compound L}$$

$$0.02 \text{ mole L requires} = 0.01 \text{ mole H}_2\text{SO}_4$$

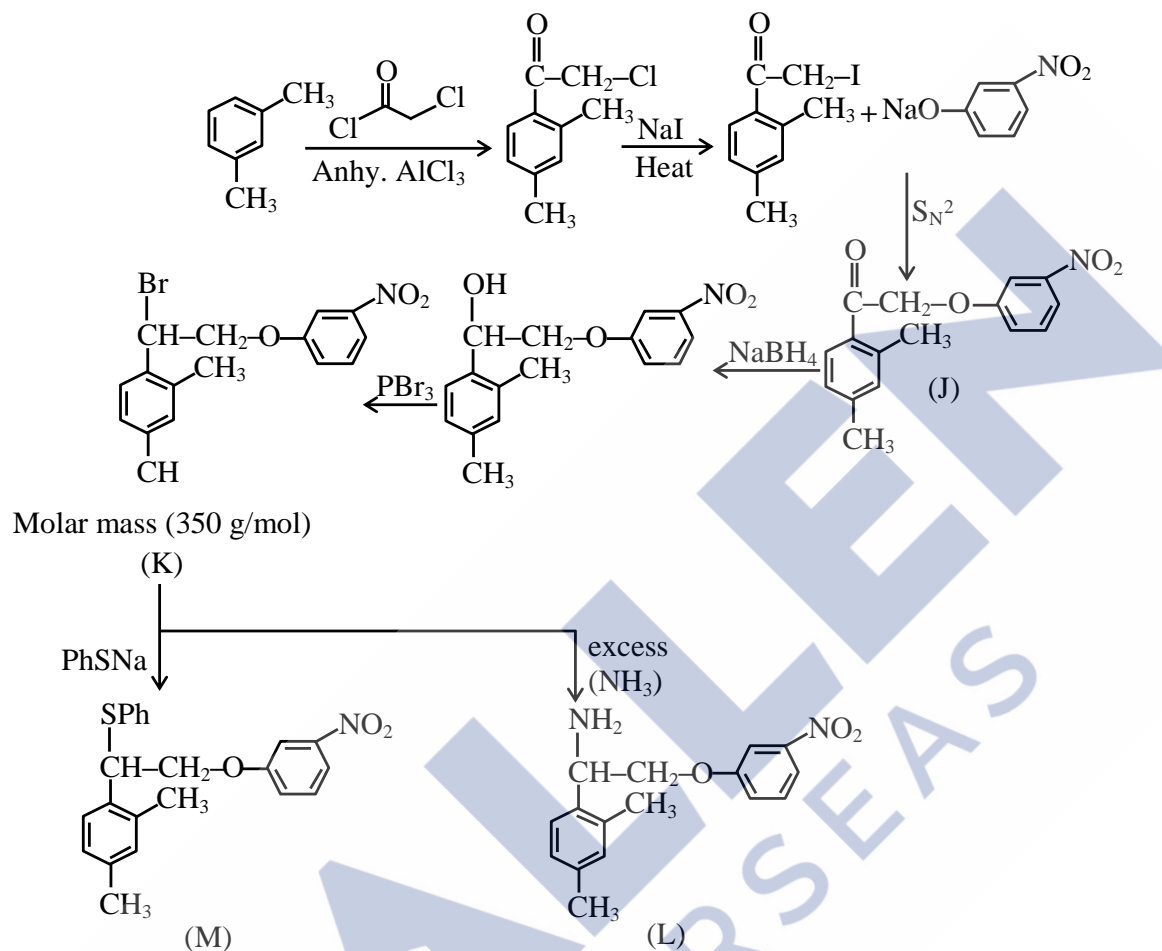
$$\frac{\text{Molarity} \times V(\text{ml})}{1000} = 0.01$$

$$V_{(\text{mL})} = 10$$

18. In sulphur estimation by Carius method, the amount of BaSO₄ formed from 3.79 g of M is ____ g.

Ans. (2.33)

Sol.



Molecular formula of M = C₂₂H₂₁NO₃S

Molar mass of M = 379 gm/mol

Given mass of M = 3.79 gm

Hence Moles of M = $\frac{3.79}{379} = 0.01$

Molecule of M contains 1 sulphur atom so 0.01 mole of BaSO₄ is formed

Mass of BaSO₄ = 0.01 × 233 = 2.33 g