

MEMORY BASED QUESTIONS JEE-MAIN EXAMINATION – APRIL 2026

(HELD ON SATURDAY 04th APRIL 2026)

TIME : 9:00 AM TO 12:00 NOON

CHEMISTRY

TEST PAPER WITH SOLUTION

1. Calculate number of moles of KMnO_4 needed to oxidise the mixture containing one mole each of FeC_2O_4 , FeSO_4 , $\text{Fe}_2(\text{C}_2\text{O}_4)_3$, $\text{Fe}_2(\text{SO}_4)_3$ in acidic medium

Ans. (2)

Sol. Meq. of $\text{KMnO}_4 = \text{Meq of } (\text{FeC}_2\text{O}_4 + \text{FeSO}_4 + \text{Fe}_2(\text{C}_2\text{O}_4)_3)$

$$\text{moles} \times 5 = 1 \times 3 + 1 \times 1 + 1 \times 6$$

$$\text{moles} = \frac{10}{5}$$

$$\text{moles} = 2$$

2. Find the ratio of wave number ($\bar{\nu}$) of 1st line of Balmer series and Brackett series for Hydrogen-like species.

(1) $\frac{1}{0.09}$

(2) $\frac{0.81}{5}$

(3) $\frac{5}{0.81}$

(4) 0.09

Ans. (3)

Sol. $\bar{\nu}_1 = R_H (Z)^2 \left[\frac{1}{2^2} - \frac{1}{3^2} \right] \Rightarrow$ 1st line of Balmer series

$\bar{\nu}_2 = R_H (Z)^2 \left[\frac{1}{4^2} - \frac{1}{5^2} \right] \Rightarrow$ 1st line of Brackett series

$$\Rightarrow \frac{\bar{\nu}_1}{\bar{\nu}_2} = \frac{500}{81}$$

3. The reaction follow 1st order reaction



Find the fraction of molecules dissociated in time t.

[$K_1 =$ Rate constant]

(1) $1 - e^{-K_1 t}$

(2) $1 + e^{-K_1 t}$

(3) $1 - e^{+K_1 t}$

(4) $e^{-K_1 t}$

Ans. (1)

Sol. For 1st order reaction

$$a - x = ae^{-K_1 t}$$

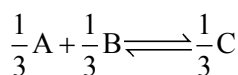
$$\Rightarrow x = a [1 - e^{-K_1 t}]$$

$$\Rightarrow \frac{x}{a} = ' \alpha ' = 1 - e^{-K_1 t}$$

4. For the reaction



Calculate K_p for the reaction



(1) 3×10^{-3}

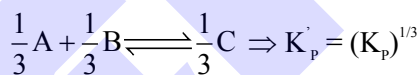
(2) $\frac{1}{3} \times 10^{-3}$

(3) 9×10^{-3}

(4) 3×10^{-2}

Ans. (4)

Sol. $A + B \rightleftharpoons C \quad K_p = 2.7 \times 10^{-5}$



$$K'_p = (2.7 \times 10^{-5})^{1/3}$$

$$K'_p = (27 \times 10^{-6})^{1/3}$$

$$K'_p = 3 \times 10^{-2}$$

5. Certain amount of non-volatile, non-electrolyte solute dissolved in 40g solvent, which decreases its vapour pressure from 760 torr to 750 torr. If Boiling pt of solvent and solution are 319.5 K and 320 K respectively. Find moles of solvent used (K_b of solvent = $0.3 \text{ K-Kg mol}^{-1}$):

Ans. (5)

Sol. $\frac{P^\circ - P_s}{P_s} = i \cdot \text{molality} \times \frac{(\text{M. solvent})}{1000}$

$$\Delta T_b = i \cdot K_b \cdot \text{molality} \Rightarrow \text{molality} = \frac{0.5}{0.3}$$

$$(\text{Molecular Mass}) = \frac{600}{75} \text{ g}$$

$$\text{Moles} = \frac{40}{600 / 75} = 5$$

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6. Solution of 5 ml, 0.1 M NH_3 added with 250 ml, 0.1M NH_4Cl solution. Calculate ($\text{pH} \times 10^{-3}$)
 $\text{pK}_b(\text{NH}_4\text{OH}) = 4.74$ ($\log 5 = 0.7$)

Ans. (756)

Sol. On mixing final volume = 255 ml

$$[\text{NH}_3] = \frac{5 \times 0.1}{255}$$

$$[\text{NH}_4\text{Cl}] = \frac{250 \times 0.1}{255}$$

$$\text{pOH} = \text{pK}_b + \log \frac{[\text{NH}_4\text{Cl}]}{[\text{NH}_3]}$$

$$\text{pOH} = 4.74 + \log \frac{250 \times 0.1}{5 \times 0.1}$$

$$\text{pOH} = 6.44$$

$$\text{pH} = 14 - 6.44 = 7.56$$

7. Calculate number of molecules and moles of SO_2 in its 1.479 lit at STP.

(1) 3.92×10^{22} , 0.065 (2) 3.92×10^{23} , 0.65

(3) 1.96×10^{22} , 0.033 (4) 1.96×10^{23} , 0.33

Ans. (1)

Sol. Moles = $\frac{1.479}{22.7} = 0.065$

$$\text{Molecules} = 0.065 \times N_A = 3.92 \times 10^{22}$$

8. An ideal gas placed in a container at (P_1, V_1, T_1) and another ideal gas placed in different container at (P_2, V_2, T_2) are mixed at final pressure of P and final volume of V. Calculate final temperature.

(1) $\left(\frac{T_1 T_2}{P_1 V_1 T_2 + P_2 V_2 T_1} \right) \cdot \frac{1}{PV}$

(2) $\left(\frac{T_1 T_2}{P_1 V_1 T_2 + P_2 V_2 T_1} \right) \cdot PV$

(3) $\left(\frac{P_1 V_1 T_2 + P_2 V_2 T_1}{T_1 T_2} \right) \cdot PV$

(4) $\left(\frac{P_1 V_1 + P_2 V_2}{T_1 T_2} \right) \cdot \frac{1}{PV}$

Ans. (2)

Sol. By conservation of moles

$$n_1 + n_2 = n_f$$

$$\frac{P_1 V_1}{RT_1} + \frac{P_2 V_2}{RT_2} = \frac{PV}{RT_f}$$

$$T_f = \left(\frac{T_1 T_2}{P_1 V_1 T_2 + P_2 V_2 T_1} \right) \cdot PV$$

9. **Statement-1** : Heat capacity at constant volume is always greater than heat capacity at constant pressure.

Statement-2 : At constant volume as work done is zero, heat given to the chaotic motion is reflected by increase in temperature.

- (1) Statement-1 and statement-2 both are correct.
 (2) Statement-1 is correct but statement-2 is incorrect.
 (3) Statement-1 is incorrect but statement-2 is correct.
 (4) Both statement-1 and statement-2 are incorrect.

Ans. (3)

10. **Statement-1** : Under certain conditions, the covalency of oxygen can be upto 4. In SO_2 , the oxidation state of oxygen is -2 and in OF_2 the oxidation state of oxygen is $+2$.

Statement-2 : The anomalous behaviour of oxygen in 16th group is due to its small size and high electronegativity.

- (1) Statement-1 and statement-2 both are correct.
 (2) Statement-1 is correct but statement-2 is incorrect.
 (3) Statement-1 is incorrect but statement-2 is correct.
 (4) Both statement-1 and statement-2 are incorrect.

Ans. (1)

Sol. Oxygen can have covalency 4

In SO_2 ; O.S. of O = -2

In OF_2 ; O.S. of O = $+2$

Anomalous behaviour of oxygen is due to high EN and small size.

11. Anion X^- contains 45 neutrons & 36 electrons. The Atomic mass period number & state in which "X" exists is :

- (1) Atomic mass : 80 ; Period number = 3; State = liquid
 (2) Atomic mass : 35 ; Period number = 3; State = gas
 (3) Atomic mass : 80 ; Period number = 4; State = liquid
 (4) Atomic mass : 127 ; Period number = 5; State = Solid

Ans. (3)

Sol. X = Br ; Atomic mass = 80

Period 4

Br_2 exist as liquid.



12. Find the value of n , l , m and s for 19^{th} e^- of Cr atom :

(1) $n = 3$; $l = 2$; $m = 1$; $S = +\frac{1}{2}$

(2) $n = 4$; $l = 0$; $m = 0$; $S = +\frac{1}{2}$

(3) $n = 2$; $l = 1$; $m = 1$; $S = -\frac{1}{2}$

(4) $n = 3$; $l = 2$; $m = 0$; $S = 0$

Ans. (2)

Sol. Cr $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^5$

\Rightarrow 19^{th} e^- belongs to 4s subshell

$n = 4$; $l = 0$; $m = 0$; $s = +\frac{1}{2}$ or $-\frac{1}{2}$

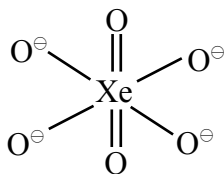
13. In the molecule XeO_6^{4-} ; total number of lone pairs and σ bond pairs on central atom Xe are :-

Ans. σ bond pair + lone pair = $6 + 0 = 6$

Sol. $\text{XeO}_6^{4-} \Rightarrow \text{Xe} = sp^3d^2$ hybridized .

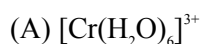
bond pair = 6 [σ bonds]

lone pair = 0

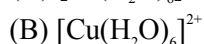


14. **Column-I**
Complex

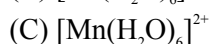
Column-II
Spin only magnetic moment (in BM)



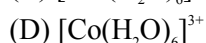
(P) 1.73



(Q) 3.87



(R) 0



(S) 5.93

Choose the correct match

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

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

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

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

Ans. (1)

Sol. $[\text{Cr}(\text{H}_2\text{O})_6]^{3+} \rightarrow 3$ unpaired e^- ; 3.87 BM

$[\text{Cu}(\text{H}_2\text{O})_6]^{2+} \rightarrow 1$ unpaired e^- ; 1.73 BM

$[\text{Mn}(\text{H}_2\text{O})_6]^{2+} \rightarrow 5$ unpaired e^- ; 5.91 BM

$[\text{Co}(\text{H}_2\text{O})_6]^{3+} \rightarrow 0$ unpaired e^- ; 0 BM

15. (A) Bond angle Cr–O–Cr in CrO_7^{2-} is 126°

(B) $\text{Na}_2\text{Cr}_2\text{O}_7$ is used as primary standard solution in titration.

(C) $\text{K}_2\text{Cr}_2\text{O}_7$ oxidises Fe^{2+} into Fe^{3+} in acidic medium.

(D) CrO_4^{2-} and $\text{Cr}_2\text{O}_7^{2-}$ are interconvertible by changing pH.

Correct statements are :

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

(3) A, B, C only (4) A, B, D only

Ans. (1)

Sol. $\text{K}_2\text{Cr}_2\text{O}_7$ is a good oxidising agent and bond angle of Cr–O–Cr bond in $\text{Cr}_2\text{O}_7^{2-}$ is 126°

$\text{Na}_2\text{Cr}_2\text{O}_7$ is not a primary standard.

In acidic medium $\text{Cr}_2\text{O}_7^{2-}$ exists and it get converted into CrO_4^{2-} in basic medium.

16. Match the column :

| | Column-I (Reaction) | | Column-II (Reagent) |
|-----|------------------------|-----|-------------------------------------|
| (A) | Finkelstein reaction | (P) | NaI/Acetone |
| (B) | Swarts reaction | (Q) | Na/THF |
| (C) | Fittig reaction | (R) | $\text{Cu}_2\text{Cl}_2/\text{HCl}$ |
| (D) | Sandmeyer reaction | (S) | SbF_3 |

Match correct reagents with given reactions :

(1) A-S ; B-Q ; C-P ; D-R

(2) A-P ; B-S ; C-Q ; D-R

(3) A-S ; B-Q ; C-R ; D-P

(4) A-Q ; B-P ; C-S ; D-R

Ans. (2)

Sol. Theory based

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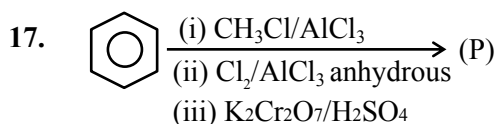
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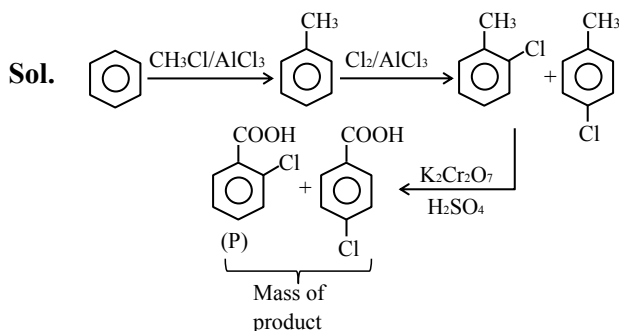
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When X gm of product P react with NaHCO₃, 11.2 dm³ CO₂ gas at STP is obtained. Find out the mass of P in gram.

Ans. (78.25 gm)



$$\text{No. of P} = \frac{11.2}{22.4} = 0.5 \text{ mole}$$

$$M_{\text{C}_7\text{H}_5\text{O}_2\text{Cl}} = 156.5 \text{ gm}$$

$$W_{\text{P}(\text{C}_7\text{H}_5\text{O}_2\text{Cl})} = 156.5 \times 2 = 78.25$$

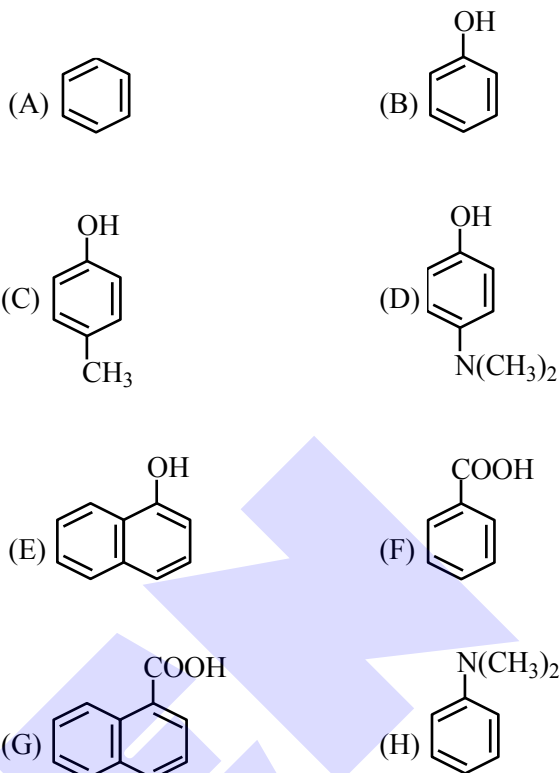
18. Arrange the following groups according to their decreasing order of electron withdrawing nature – COOH, –CN –I and –NO₂

- (1) –CN > –NO₂ > –I > –COOH
- (2) –NO₂ > –CN > –COOH > –I
- (3) –COOH > –CN > –I > –NO₂
- (4) –I > –COOH > –NO₂ > –CN

Ans. (2)

Sol. Theory based

19. Soluble in aq. NaOH



(1) 4

(2) 5

(3) 6

(4) 7

Ans. (3)

Sol. (B), (C), (D), (E), (F), (G)

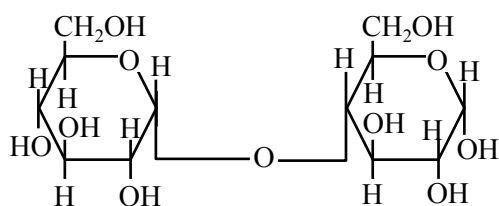
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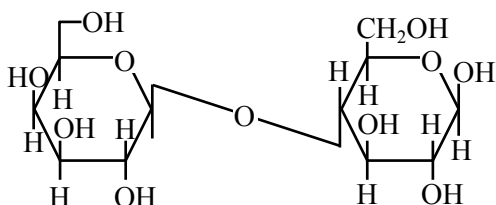
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20. **Statement-1** : Maltose is a non reducing sugar



Statement-2 : Lactose is a reducing sugar.



- (1) Both statement 1 and statement 2 are correct
 (2) Statement 1 is correct and statement 2 is incorrect
 (3) Statement 1 is incorrect and statement 2 is correct.
 (4) Both statement 1 and statement 2 are incorrect

Ans. (3)

Sol. Maltose and lactose both have anomeric OH group so both are reducing sugar

21. Match the column-I with column-II :

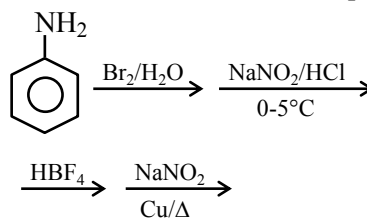
| | Column-I (Name of amino acid) | | Column-II (One letter code) |
|-----|----------------------------------|-----|--------------------------------|
| (A) | Arginine | (P) | K Essential |
| (B) | Lysine | (Q) | R Essential |
| (C) | Aspartic acid | (R) | D Non essential |
| (D) | Glutamic acid | (S) | E Non essential |

- (1) A-P ; B-Q ; C-R ; D-S
 (2) A-Q ; B-P ; C-R ; D-S
 (3) A-Q ; B-P ; C-S ; D-R
 (4) A-R ; B-S ; C-P ; D-Q

Ans. (2)

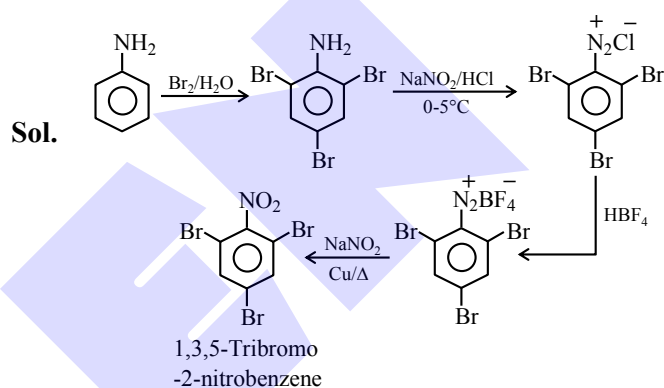
Sol. Arginine (R) and Lysine (K) are essential amino acid on the other hand Aspartic acid (D) and Glutamic acid (E) are Non-essential amino acid.

22. IUPAC Name of formed compound :

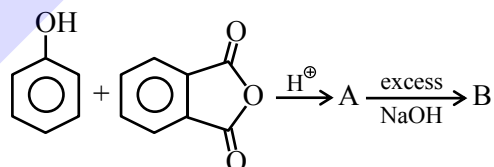


- (1) 2,4,6-Tribromo-1-nitrobenzene
 (2) 4-Bromonitrobenzene
 (3) 1,3,5-Tribromo-2-nitrobenzene
 (4) 1,3,5-Tribromofluorobenzene

Ans. (3)



23. Consider following reaction :

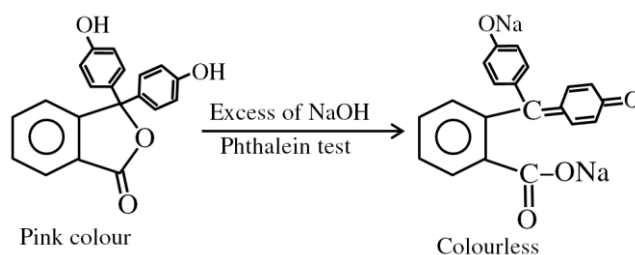


What is the colour of final compound B ?

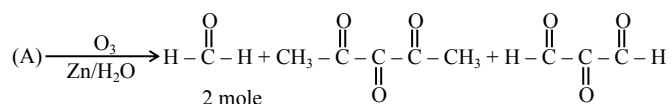
- (1) Violet (2) Red
 (3) Colourless (4) Pink

Ans. (3)

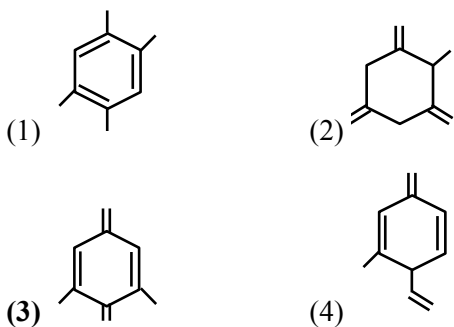
Sol. A is Phenolphthalein



24.

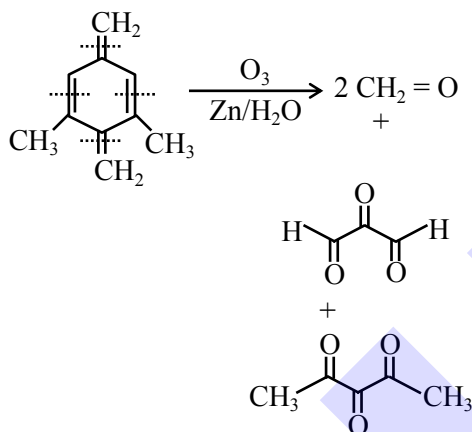


Identify the structure of compound A.



Ans. (3)

Sol.



25. 2 gm of organic compound on heating with AgNO_3 in Carius method, 3.36 gm of AgBr was obtained. How many no. of carbons atoms are present in empirical formula ?

(% of carbon in organic compound is 26.7%)

Ans. (5)

$$\text{Sol. } n_{\text{Br}} = \frac{3.36}{(108 + 80)}$$

r = no. of Br atoms in organic compound

$$n_{\text{organic compound}} = \frac{3.36}{(108 + 80) \times x} = \frac{2}{M}$$

$$M = \frac{2 \times 188 \times x}{3.36}$$

$$M = \frac{1}{2} \times x$$

(x is integer)

$$W_c = \frac{112 \times x \times 26.7}{100} = 30 \times x$$

$$n_c = \frac{30 \times x}{12} = 2.5 \times x$$

take $x = 2$, $n_c = 5$

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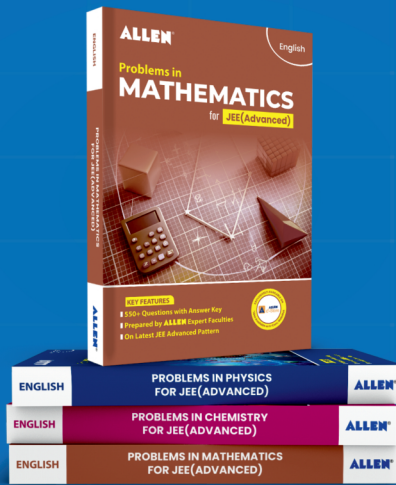
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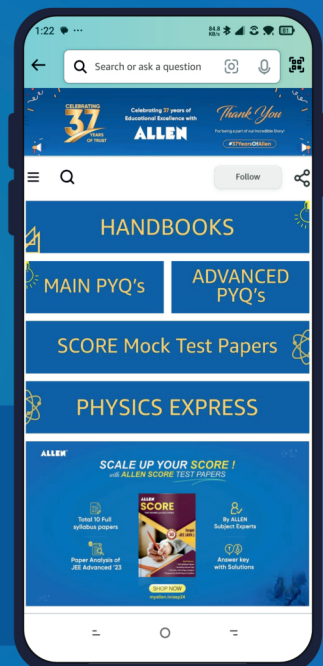
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