MEMORY BASED QUESTIONS JEE–MAIN EXAMINATION – APRIL 2026

(HELD ON MONDAY 06th APRIL 2026) **TIME : 9:00 AM TO 12:00 NOON**

CHEMISTRY

TEST PAPER WITH SOLUTION

1. Hydrolysis of sucrose follows 1st order kinetics to produce glucose and fructose. If $(t_{1/2})$ for decomposition of sucrose is 3 hr. Find % of sucrose left after 6 hr.

Ans. **(25)**

Sol. Sucrose + $H_2O \rightarrow$ glucose + fructose

$t_{1/2} = 3$ hr

For 1st order $t_{75\%} = 2 \times t_{1/2}$

So $t = 6$ hr, 75% of sucrose decomposed

So 25% of sucrose remains after 6 hr.

2. If at infinite dilution, molar conductivities of $BaCl_2$, HCl and H_2SO_4, are x_1, x_2, x_3 S cm^2mol^{-1} respectively. Find solubility product of $BaSO_4$.

Given K_{BaSO_4} (Specific conductance) = x S cm^{-1}

(1) $\left(\frac{x}{x_1+x_3-2x_2}\right)^2 \times 10^6$

(2) $\left(\frac{x_1+x_3-2x_2}{x}\right)^2 \times 10^6$

(3) $\left(\frac{x}{x_1+x_3-x_2}\right)^2 \times 10^3$

(4) $\left(\frac{x}{x_1+x_3-x_2}\right)^2 \times 10^6$

Ans. **(1)**

Sol. Using Kohlrausch's Law

$$\mathring{\Lambda}_{M_{BaSO_4}} = x_1 + x_3 - 2x_2$$

$$\mathring{\Lambda}_M = \frac{\kappa \times 1000}{S} \Rightarrow$$

$$S = \frac{x}{x_1+x_3-2x_2} \times 10^3 \text{ 'M'}$$

$$\Rightarrow K_{Sp} = S^2$$

3. For given four processes compare magnitude of work

	Process		Work
(I)	Isothermal multistep Expansion	→	W_1
(II)	Isothermal single-step Expansion	→	W_2
(III)	Isothermal single-step Compression	→	W_3
(II)	Isothermal multi-step Compression	→	W_4

Which of the following is correct option

(1) $|W_1| > |W_2| > |W_3| > |W_4|$

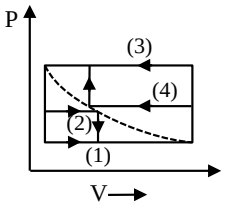
(2) $|W_1| < |W_2| < |W_3| < |W_4|$

(3) $|W_1| < |W_3| < |W_2| < |W_4|$

(4) $|W_2| < |W_1| < |W_4| < |W_3|$

Ans. **(4)**

Sol.



|W| = Area under the P–V cuve

4. A solution contain 0.25 moles of non-volatile solute dissolved in one mole of solvent. Then calculate % of vapour pressure of solution relative to vapour pressure of pure solvent?

(1) 20 (2) 40

(3) 60 (4) 80

Ans. **(4)**

Sol. $P_S = P^0.X_A$

$$\frac{P_S}{P^0} = X_A = \frac{1}{1+0.25} = 0.80$$

$\% = 0.8 \times 100 = 80$

5. 1 mole of He and 1 mole A are taken in 10 L rigid container at 400 K and equilibrium $A \rightleftharpoons B$ is established. Calculate partial pressure of He and B at equilibrium if $K_C = 4$.
(1) 3.28 atm, 2.62 atm
(2) 2.6 atm, 3.28 atm
(3) 2.6 atm, 2.6 atm
(4) 3.28 atm, 3.28 atm

Ans. **(1)**

Sol.

	A	$\rightleftharpoons$	B
t = 0	1 mol		–
t_{eq^m}	1 – x		x

$$K_C = \frac{x/10}{\frac{1-x}{10}} = 4$$

$$x = 0.8$$

$$P_{He} = \frac{1 \times 0.0821 \times 400}{10} = 3.284 \text{ atm}$$

$$P_B = \frac{0.8 \times 0.0821 \times 400}{10} = 2.62 \text{ atm}$$

6. An oxide of iron contains 69.9% iron. Find its empirical formula.
(Given : Atomic masses Fe= 56, O =16)
(1) Fe_3O_4 (2) Fe_2O_3
(3) FeO_3 (4) FeO

Ans. **(2)**

Sol.

	Fe		**Oxygen**
Moles :	$\frac{69.9}{56}$		$\frac{30.1}{16}$
Molar Ratio :	1	:	1.5
Molar Ratio :	2	:	3

Answer : **Fe_2O_3**

7.

Column-I	**Column-II**
(P) 2s	(i) Radial node = 2, Angular node = 1
(Q) 3s	(ii) Radial node = 0, Angular node = 2
(R) 4p	(iii) Radial node = 1, Angular node = 0
(S) 3d	(iv) Radial node = 2, Angular node = 0

Match the correct list -
(1) P-(iv), Q-(iii), R-(ii), S-(i)
(2) P-(iii), Q-(iv), R-(i), S-(ii)
(3) P-(i), Q-(ii), R-(iii), S-(iv)
(4) P-(ii), Q-(i), R-(iv), S-(iii)

Ans. **(2)**

Sol. Radial nodes = $n - \ell - 1$

Angular nodes = ℓ

8. For the reversible reaction at 300 K, ΔH° = 28.4 KJ/mole and equilibrium constant K = 1.8×10^{-7}, then calculate magnitude of ΔS° in Joule/K-mole.
[Given log 2 = 0.3, ℓn10 = 2.3,
R = 8.314 J/Kmole, log 3 = 0.47]

Ans. **(34 J/K-mole)**

Sol. $\Delta G^\circ = -RT\ell n K_{eq^m}$

$$\Delta H^\circ - T\Delta S^\circ = -2.303\, RT \log K_{eq^m}$$

$$\Delta S^\circ = \frac{\Delta H^\circ}{T} + 2.303R \log K_{eq^m} = \Delta S^\circ$$

$$= \frac{28.4 \times 10^3}{300} + 2.303 \times 8.314 \log[18 \times 10^{-8}]$$

$$= -34.47 \text{ J/K-mole}$$

9. If minimum wavelength for H-atom in Lyman series is 'x', then maximum wavelength of Balmer series of He^+ ion in terms of 'x' will be

(1) $\frac{3}{4}x$ (2) x

(3) $\frac{9x}{5}$ (4) $\frac{5x}{9}$

Ans. **(3)**

$$\frac{1}{x} = R \times 1^2 \times \left(\frac{1}{1^2} - \frac{1}{\infty^2}\right) \text{.....(1)}$$

$$\frac{1}{\lambda} = R \times 2^2 \times \left(\frac{1}{2^2} - \frac{1}{3^2}\right) \text{.....(2)}$$

$$\frac{1}{\lambda} = R \times 4 \times \frac{5}{4 \times 9}$$

$$\frac{1}{\lambda} = \frac{1}{x} \times \frac{5}{9}$$

$$\lambda = \frac{9x}{5}$$

10. Find correct order of increasing boiling point in the following given molecules :
(A) n-C_4H_9OH (B) n-$C_4H_9NH_2$
(C) n-C_4H_{10} (D) $C_2H_5NHC_2H_5$
(1) C < D < B < A (2) A < B < D < C
(3) D < C < A < B (4) B < C < D A

Ans. **(1)**

Sol. Boiling point $\propto$ Intermolecular attraction
$\propto$ Number of H-bonding

11. Match disease with the deficiency.

	Column-I		Column-I
(A)	Scurvy	(P)	Pyridoxine
(B)	Convulsions	(Q)	Vitamin-A
(C)	Cheilosis	(R)	Ascorbic acid
(D)	Xerophthalmia	(S)	Riboflavin

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

Ans. **(1)**

Sol. Vitamin–A $\rightarrow$ Xerophthalmia
Vitamin-C (Ascorbic acid) $\rightarrow$ Scurvy
Vitamin-B_2 (Cheilosis) $\rightarrow$ Cheilosis
Vitamin-B_6 (Pyridoxine) $\rightarrow$ Convulsions

12. **Statement-I :** Al is more electropositive than Tl because, $E^0_{Al^{3+}/A\ell}$ is negative & $E^0_{T\ell^{3+}/T\ell}$ is positive.

Statement-II : For B-atom ; sum of first three ionization energy is very high thus it forms covalent compounds.

(1) Both statement-I & statement-II are correct
(2) Both statement-I & statement-II are incorrect
(3) Statement-I is correct but statement-II is incorrect
(4) Statement-I is incorrect but statement-II is correct.

Ans. **(1)**

Sol. $E^0_{Al^{3+}Al} = -1.66$

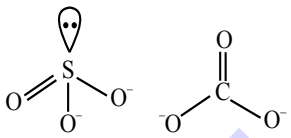
$E^0_{T\ell^{3+}/T\ell} = 1.26$

13. Which of the following pair of specie(s) have different lewis strcuture

(A) SO_3^{2-}, CO_3^{2-} (B) O_2^{2-}, F_2
(C) CN^-, CO (D) NH_3, H_3O^+
(E) MnO_4^-, CrO_4^{2-}
(1) (A) only (2) (A) & (B) only
(3) (A) & (E) only (4) (C) & (D) only

Ans. **(1)**

Sol. Only SO_3^{2-} & CO_3^{2-} has different structure



14. Consider the statements

(A) In Zeigler –Natta catalyst, d-block central metal ion has spin magnetic moment of 2.84 BM
(B) In Zeigler –Natta catalyst, p-block element has + 3 oxidation state
(C) Basic vanadium oxide is used in production of H_2SO_4
(D) Catalyst used in wacker's process has central metal with d^8 configuration

(1) (A) , (B) & (C) are correct
(2) (B) & (D) are correct
(3) (C) & (D) are correct
(4) (B) , (C) & (D) are correct

Ans. **(2)**

Sol. Ziegler natta catalyst : $TiCl_3/TiCl_4 + Al(C_2H_5)_3$
V_2O_5 is amphoteric oxide used in production of H_2SO_4
$PdCl_2$ is used in Wacker's process.

15. Find correct order of increasing boiling point in the following given molecules :

(A) n-C_4H_9OH (B) n-$C_4H_9NH_2$

(C) n-C_4H_{10} (D) $C_2H_5NHC_2H_5$

(1) C < D < B < A (2) A < B < D < C

(3) D < C < A < B (4) B < C < D A

Ans. **(1)**

Sol. Boiling point ∝ Intermolecular attraction

∝ Number of H-bonding

16. Match disease with the deficiency.

	Column-I		Column-I
(A)	Scurvy	(P)	Pyridoxine
(B)	Convulsions	(Q)	Vitamin-A
(C)	Cheilosis	(R)	Ascorbic acid
(D)	Xerophthalmia	(S)	Riboflavin

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

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

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

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

Ans. **(1)**

Sol. Vitamin–A → Xerophthalmia

Vitamin-C (Ascorbic acid) → Scurvy

Vitamin-B_2 (Cheilosis) → Cheilosis

Vitamin-B_6 (Pyridoxine) → Convulsions

17. Match with tab test of amino acids.

Column-I	Column-II
A → Glutamine	I → Hinsberg test
B → Lysine	II → Neutral $FeCl_3$
C → Tyrosine	III → Cerric ammonium nitrate
D → Serine	IV → Hoffmann Bromamide

(1) A – I, B-IV, C-III, D-II

(2) A – IV, B-I, C-II, D-III

(3) A – I, B-III, C-IV, D-II

(4) A – IV, B-II, C-I, D-III

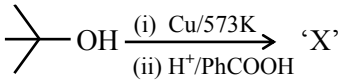
Ans. **(2)**

Sol. Glutamine has amide functional group inside chain. So it gives Hoffmann bromamide reaction.

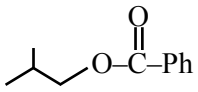
Lysine has 1° amine group. So it gives +ve Hinsberg test.

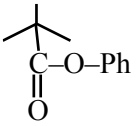
Tyrosine has phenolic OH. So it gives +ve test with neutral $FeCl_3$.

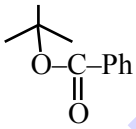
Serine has alcohlic OH group. So it gives +ve test with cerric ammonium nitrate.

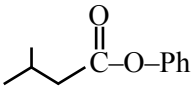
18. 

'X' may be :

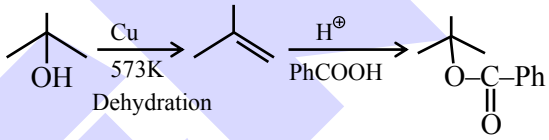
(1) 

(2) 

(3) 

(4) 

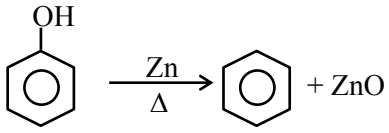
Ans. **(3)**

Sol. 

19. 4.7 g of phenol $\xrightarrow{Zn,\Delta}$ 'X'

If reaction goes to 60% yield of X. Find number of moles of 'X' ….. × 10^{-2} are formed.

Ans. **(3)**

Sol. 

Moles of phenol = $\frac{4.7}{94.0} = 0.05\,\text{mol}$

Reaction is 1 : 1 so 0.05 mole of phenol will give 0.05 mole of benzene on 100% yield

For 60% yield = 0.05 × 0.60

= 0.03 mol.

mol of 'X' = 3 × 10^{-2} mol

20. Given below are two statements :

Statement-I : 2,4-Diethylcyclohexanone and 2-methyl-6-propylcyclohexanone are metamers.

Statement-II : 2,2,6,6-Tetraethylcyclohexanone will show tautomerism.

Choose correct options :

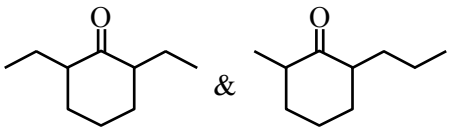
(1) Statement-I and Statement-II both are correct.

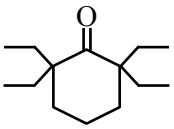
(2) Statement-I and Statement-II both are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

Ans. (3)

Sol.  are metamers

 will not show tautomerism.

21. **Statement-I :** 3-Phenylprop-1-ene will react with HBr and give alkyl halide as major product having 1 chiral carbon atom.

Statement-II : Aryl chloride and Aryl cyanide both can be formed by gattermann and sandmeyer reaction.

(1) Both Statement I and Statement II are incorrect.

(2) Statement I is correct but Statement II is incorrect.

(3) Statement I is incorrect but Statement II is correct.

(4) Both Statement I and Statement II are correct.

Ans. (2)

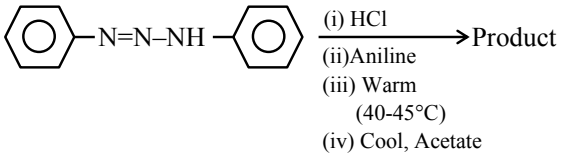
Sol. $Ph-CH_2-CH=CH_2 \xrightarrow{HBr} Ph-CH_2-\overset{\oplus}{C}H-CH_3$

$\downarrow$ Hydride shift

$Ph-\underset{\underset{Br}{|}}{\overset{*}{C}}H-CH_2-CH_3 \xleftarrow{Br^-} Ph-\overset{\oplus}{C}H-CH_2-CH_3$

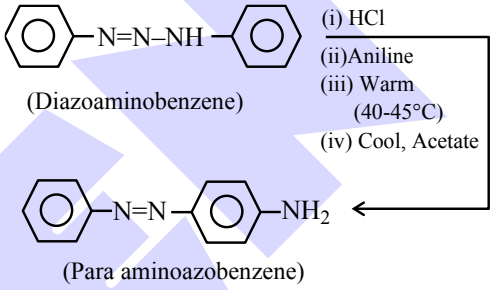
Chiral carbon

Aryl cyanide is not formed by Gattermann reaction.

22. 

Find percentage of nitrogen in the final product.

Ans. (21.30%)

Sol. 

- HCl catalysed hydrolysis.
- Aniline acts as a solvent and reactant.
- The mixture is gently heated to facilitate rearrangement.
- After the reaction is complete, the mixture is cooled and treated with sodium acetate to neutralise excess acid and precipitate the final product.

Mass percentage of nitrogen in final product

$= \frac{42}{197} \times 100 = 21.30\ \%$

23. Given below are two statements :

Statement-I : Methane can be prepared by decarboxylation of sodium acetate, by Kolbe's electrolysis and by CH_3MgBr.

Statement-II : Methane can't be prepared by unsaturated hydrocarbon and by Wurtz reaction.

Choose correct options :

(1) Statement-I and Statement-II both are correct.

(2) Statement-I and Statement-II both are incorrect.

(3) Statement-I is correct but Statement-II is incorrect.

(4) Statement-I is incorrect but Statement-II is correct.

Ans. (4)

Sol. Methane can not be prepared by Kolbe's electrolysis process.

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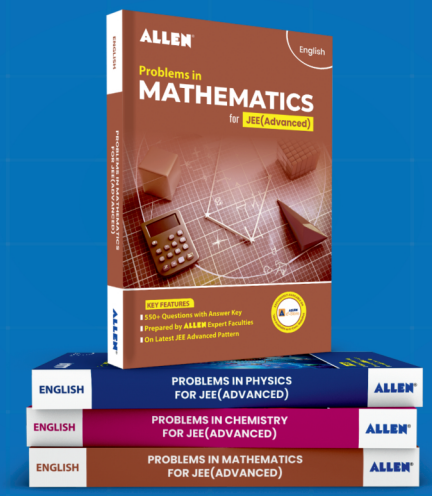

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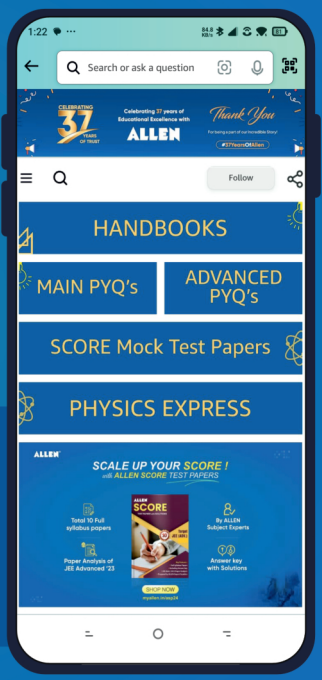

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