MEMORY BASED QUESTIONS JEE–MAIN EXAMINATION – APRIL 2026

(HELD ON SUNDAY 05th APRIL 2026) **TIME : 3:00 PM TO 6:00 PM**

CHEMISTRY

TEST PAPER WITH SOLUTION

1. In 1 litre aqueous solution 20 g of Haemoglobin is present at 300 K. This solution has height difference of 80 mm, when separated from pure water through S.P.M. If density of solution is 1000 kg/m^3, then calculate molar mass of Haemoglobin in kg/mol. (use : g = 10 m/s^2)

Ans. **(62)**

Sol. $\pi = CRT = \rho gh$

$$\frac{20/GMM}{1litre\times10^{-3}} \times 8.314 \times 300$$

$= 80 \times 10^{-3} \times 1000 \times 10$

$$GMM = \frac{20\times8.314\times300}{800}\times1000$$

GMM = 62355 g/mol

= 62.355 kg/mol

2. For the reaction :

$A(g) \rightleftharpoons B(g) + C(g)$

Initial moles of A(g) is 'a'. At equilibrium 'x' moles of 'A' decompose at total pressure 'P'. Calculate K_P for given reaction :

(1) $\frac{x^2P}{a^2-x^2}$ (2) $\frac{x^2P}{a^2+x^2}$

(3) $\frac{2xP}{a^2-x^2}$ (4) $\frac{x}{a^2-x^2}P$

Ans. **(1)**

Sol.

	$A(g) \rightleftharpoons$	$B(g)$ +	$C(g)$
t = 0	a	0	0
t_{eq}	a–x	x	x

$$K_p = \frac{(x)(x)}{(a-x)}\times\left(\frac{P}{a+x}\right)$$

$$K_P = \frac{x^2P}{a^2-x^2}$$

3. Determine the order of molar heat capacity (C_m) of $Br_2(\ell)$, Cu(s) and He(g) at 298 K and 1 atm.

(1) $Br_2(\ell)$ > He(g) > Cu(s)

(2) $Br_2(\ell)$ > Cu(s) > He(g)

(3) He(g) > $Br_2(\ell)$ > Cu(s)

(4) Cu(s) > $Br_2(\ell)$ > He(g)

Ans. **(2)**

Sol. Data based.

4. 20 gm Zn is treated with 50 ml, 50% (w/w) H_2SO_4 solution (d = 1.3 g/ml). The volume of H_2 gas evolved at STP is. (At wt. of Zn = 65)

(1) 6.81 L (2) 7.22 L

(3) 3.4 L (4) 1.46 L

Ans. **(1)**

Sol. Mass of $H_2SO_4 = \frac{50\times1.3}{98}\times\frac{50}{100} = \frac{32.5}{98}$

$Zn(s) + H_2SO_4(aq) \rightarrow ZnSO_4(aq.) + H_2(g)$

$\frac{20}{65}$ $\frac{32.5}{98}$

Moles of H_2 formed = 0.3

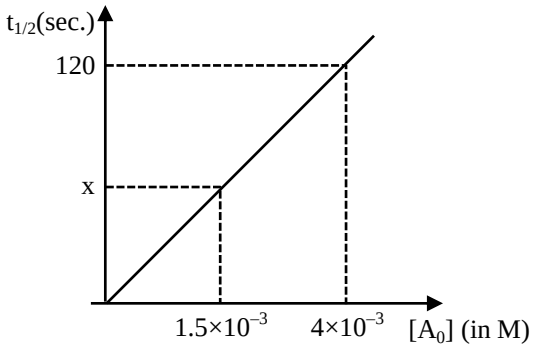
Volume of H_2 = 0.3 × 22.7 = 6.81 L.

5. For the reaction

A ⟶ Product ;

Following graph is observed between half life ($t_{1/2}$) & initial conc. of A.

Then find the value of 'x'



Ans. **(45)**

Sol. $t_{1/2} \propto [A_0]^{1-n}$

According to graph n = 0

$\therefore t_{1/2} \propto A_0$

$$\frac{120}{x} = \frac{4\times10^{-3}}{1.5\times10^{-3}}$$

$$\Rightarrow x = \frac{120\times3}{8} = 45 \text{ sec.}$$

6. For the given reaction :_

$X_2(g) + Y_2(g) \rightleftharpoons 2XY(g)$

following data table is provided at 600K.

	$\Delta_f H$(kJ/mol)	S_m (J/K-mol)
X_2	80	140
Y_2	8	250
XY	42	200

Calculate $\Delta_r G$ at 600 K.

(1) –10 kJ/mol (2) –100 kJ/mol

(3) –2 kJ/mol (4) +2 kJ/mol

Ans. **(1)**

Sol. $\Delta_r G = \Delta_f H - T.\Delta_r S$

$\Delta_r H = (2 \times 42 - 80 - 8) = -4$ kJ/mol

$\Delta_r S = (400 - 250 - 140) = +10$ J/K.mol

$\Delta_r G = -4000 - 600 \times (10)$

$= -10{,}000$ J/mol $= -10$ kJ/mol

7. Silver rod is dipped in aq. Solution of $AgNO_3$ of unknown concentration and Zn rod is dipped in 1M $ZnSO_4$ aq. solution. Both these containers are connected to form a galvanic cell showing emf of 1.6V. Calculate value of $\log_{10}[Ag^+]$.

$E^o_{Ag^+/Ag(s)} = 0.8V \quad E^o_{Zn^{2+}/Zn(s)} = -0.76V$

$$\left[\text{use } \frac{2.303RT}{F} = 0.059\right]$$

(1) $\frac{5.9}{4}$ (2) $\frac{4}{5.9}$

(3) $\frac{2}{5.9}$ (4) $\frac{8}{5.9}$

Ans. **(2)**

Sol. Cell Reaction :

$Zn(s) + 2Ag^{\oplus}(aq) \longrightarrow 2Ag(s) + Zn^{+2}(aq)$

$$E_{cell} = E^o_{cell} - \frac{0.059}{n}\log(Q)$$

$$1.6 = 1.56 - \frac{0.059}{2}\log\frac{1}{(Ag^+)^2}$$

$0.04 = +0.059 \log[Ag^+]$

$$\text{Log}[Ag^+] = \frac{4}{5.9}$$

8. Molar conductivity and conductance of an electrolytic solution are 123.5 Scm^2/mole and 0.19 S respectively. Concentration of solution is x% w/w, then find the value of x.
(cell constant = 1.3 S cm^{-1} ; density of solution = 1 gm/ml ; molar mass of electrolyte =75 g/mole)

Ans. **(15)**

Sol. $$\Lambda_m = \frac{(G\times G^*)\times1000}{M}$$

$$123.5 = \frac{0.19\times1.3\times1000}{M}$$

$M = 2$

$\therefore$ 1 L solution contains 2 mole electrolyte

$$\% \text{ w/w} = \frac{2\times75}{1000\times1}\times100 = 15$$

9. For the complex ion with configurations d^3, d^4 (low spin), d^5 (high spin) , d^7 (low spin) and d^6 (high spin) , the total number of unpaired electrons is _____.

Ans. **(15)**

Sol. $d^3 \rightarrow$ 3 unpaired electrons

d^4 (low spin) $\rightarrow$ 2 unpaired electrons

d^5 (high spin) $\rightarrow$ 5 unpaired electrons

d^7 (low spin) $\rightarrow$ 1 unpaired electrons

d^6 (high spin) $\rightarrow$ 4 unpaired electrons

10. Specie "X" is dissolved in H_2SO_4 and reacts with SO_2 to give green color solution. The specie "X" is

(1) $KMnO_4$ (2) $K_2Cr_2O_7$

(3) $Pb(CH_3COO)_2$ (4) KI

Ans. **(2)**

Sol. $$K_2Cr_2O_7 + SO_2 \xrightarrow{H_2SO_4} \underset{\text{Green solution}}{Cr_2(SO_4)_3} + SO_4^{2-}$$

11. Statement I : Aluminium reacts with excess of NaOH to form $[Al(OH)_6]^{3-}$

Statement II : For the complex

$[Fe(H_2O)_6]^{3+}$: $\left[\left(d_{xy}=d_{yz}=d_{zx}\right)<\left(d_{x^2-y^2}=d_{z^2}\right)\right]$

and for the complex

$[FeCl_4]^{2-}$: $\left[\left(d_{xy}=d_{yz}=d_{zx}\right)>\left(d_{x^2-y^2}=d_{z^2}\right)\right]$

(1) Both Statement I and Statement II are correct

(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 incorrect

Ans. **(3)**

Sol. $Al + NaOH\ (excess) \rightarrow Na[Al(OH)_4]$

$[Fe(H_2O)_6]^{3+}$ is octahedral complex. Energy of $t_{2g} < e_g$

$[FeCl_4]^{2-}$ is tetrahedral complex. Energy of $t_2 > e$

12. Statement I : Of the following set of oxides $[Al_2O_3, Cr_2O_3]$; $[CO, N_2O]$; $[Na_2O, V_2O_3]$; $[Cl_2O_7, Mn_2O_7]$ number of sets having the same nature of oxides (basic, acidic, neutral or amphoteric) are 4.

Statement II : Of the given oxides , Na_2O, Al_2O_3 , CO, Cl_2O_7 ; the most basic and acidic oxides are Na_2O and Cl_2O_7.

(1) Both Statement I and Statement II are correct

(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 incorrect

Ans. **(1)**

Sol. Al_2O_3, Cr_2O_3 : Amphoteric

CO, N_2O : Neutral

Na_2O, V_2O_3 : Basic

Cl_2O_7, Mn_2O_7 : Acidic

13. Statement I : $ClO_4^{\ominus}$, $ICl_4^{\ominus}$, $IBr_2^{\ominus}$ are tetrahedral, square planar and linear respectively.

Statement II : $[Fe(CN)_6]^{4-}$ is d^2sp^3 hybridized.

(1) Both Statement I and Statement II are correct

(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 incorrect

Ans. **(1)**

Sol. $ClO_4^{\ominus}$ is tetrahedral

$ICl_4^{\ominus}$ is square planar

$IBr_2^{\ominus}$ is linear.

$[Fe(CN)_6]^{4-}$: Fe^{+2} – SFL $\Rightarrow d^2sp^3$ hybridized.

14. Consider the following statements.

(A) If two orbitals are having same value of "n+ℓ" then the orbital having lower value of 'n' will have lower energy.

(B) If atomic number increases then energy of orbital belonging to a particular shell increases.

(C) Among 4s, 5d, 6f and 5p orbitals, none of these orbitals have two radial nodes.

(D) Size of $2p_x$ orbital is less than $3p_x$ orbital.

Which of the following statements are correct.

(1) A and B are correct (2) B and D are correct

(3) A and D are correct (4) B and C are correct

Ans. **(3)**

Sol. Atomic number increases ; energy of orbital belonging to particular shell decreases.

Orbital	Radial node
4s	3
5d	2
6f	2
5p	3

15. If r_A and r_B are the radii of elements A and B respectively. Element A and B are covalently bonded. What will be the bond length and total length of molecule.

(1) $[r_A + r_B]$; $[2(r_A + r_B)]$

(2) $[r_A + r_B]$; $[(r_A + r_B)]$

(3) $[½(r_A + r_B)]$; $[(r_A + r_B)]$

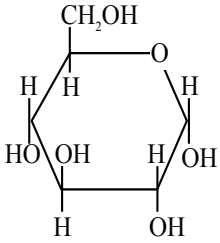
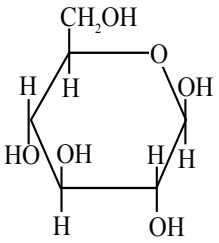
(4) $[½(r_A + r_B)]$; $[2(r_A + r_B)]$

Ans. **(1)**

Sol. According to NCERT

Bond length = $r_A + r_B$

Overall length = $2(r_A + r_B)$

16. **Statement-I :** Glucose exists in two anomeric foms  and 

Statement-II : In open chain structure at C-3, C-4, C-5 glucose and fructose have identical configuration.

(1) Both Statement I and Statement II are correct

(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 incorrect

Ans. **(1)**

Sol. α-D-Glucose and β-D-Glucose are anomers.

At C-3, C-4 and C-5 are identical configuration in glucose and fructose.

17. Grignard reagent RmgX reacts with water and releases a gas 'X' which has volume 1.4 dm^3/g at 1 atm, 273K.

'X' reacts with I_2 and form 'Y' which reacts with Na in presence of dry ether to form 'Z'. Find the molecular mass of 'Z'.

Ans. **(30)**

Sol. $RmgX \xrightarrow[\text{Acid base reaction}]{H_2O} \underset{'X'}{R-H(gas)} + Mg\begin{matrix}X\\OH\end{matrix}$

(value of R is $-CH_3$) volume 1.4 dm^3/g

Molecular mass = 16

$$CH_4 \xrightarrow{I_2} \underset{'Y'}{CH_3-I} \xrightarrow[\text{Wurtz}]{\text{Na/dry ether}} \underset{'Z'}{CH_3-CH_3}$$

Molecular mass of Z = 30

18. **Statement-I :** Benzamide on reaction with Br_2 +NaOH gives benzyl amine.

Statement-II : On nitration of aniline meta product is form more than its ortho product.

(1) Both Statement I and Statement II are correct

(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 incorrect

Ans. **(3)**

Sol. Benzamide gives aniline with Br_2 + NaOH.

19. Match the column

Column-I		Column-II	
(P)	Simple distillation	(1)	For steam volatile compound
(Q)	Fractional distillation	(2)	For liquid having nature of decompostion at it's B.P.
(R)	Steam distillation	(3)	Between two liquids having low difference in boiling point
(S)	Distillation under reduce presure	(4)	Between two liquids having high difference in boiling point

(1) P → 4, Q → 3, R → 1, S → 2

(2) P → 1, Q → 2, R → 3, S → 4

(3) P → 4, Q → 3, R → 2, S → 1

(4) P → 1, Q → 2, R → 2, S → 4

Ans. **(1)**

Sol. Theory based

20. $CH_3–CH_2–C\equiv N \xrightarrow[(ii)H_3O^+]{(i)OH^-/H_2O} \xrightarrow[(iii)H_2O]{(iii)\ Red\ P/Cl_2} X$ [major product]

IUPAC name of major product will be-

(1) 2-chloro propanoic acid

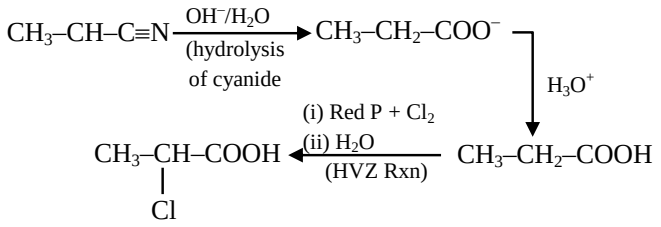
(2) 3-chloro propanoic acid

(3) propanoyl chloride

(4) 2-hydroxy propanoic acid

Ans. **(1)**

Sol.



21. Which compound has total molecular mass of 72 with three primary carbons.

(1) n-Heptane

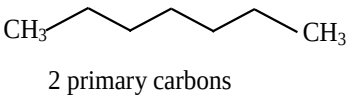
(2) 2,2-Dimethylbutane

(3) 1,1-Dimethylcyclopropane

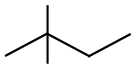
(4) 2-Methylbutane

Ans. **(4)**

Sol.

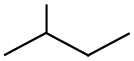


2 primary carbons



4 primary carbons

2 primary carbons



3 primary carbons

22. Find stability order of following alkenes

(a) Cis-but-2-ene

(b) 2,3-Dimethylbut-2-ene

(c) 2-Methylbut-2-ene

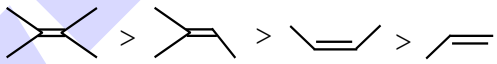
(d) Propene

(1) b > a > d > c (2) b > c > a > d

(3) a > c > b > d (4) b > a > c > d

Ans. **(2)**

Sol.



αH=12 αH=9 αH=6 αH=3

Stability ∝ Total number of H for hyperconjugation.

23. Which of the following statement is incorrect regarding tertiary structure of protein?

(1) With change in pH tertiary structure of protein does not get disrupted.

(2) Tertiary structure stabilize by H-bonding , disulphide linkage, Van der wall forces and Coulombic forces

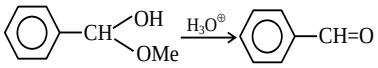
(3) Tertiary structure is globular as well as Fibrous

(4) Amino acid which are connected to each other and oriented in folding form is related to tertiary structure.

Ans. **(1)**

Sol. On changing pH tertiary strutcure of protein disrupted and amino acids intact only by peptide linkage.

24. **Statement-I :** $R-CH=O + H_2N-NH-\underset{\underset{O}{\|}}{C}-NH_2 \xrightarrow{pH=4-6} R-CH=N-\underset{\underset{O}{\|}}{C}-NH-NH_2$

Statement-II : 

(1) Both Statement I and Statement II are correct

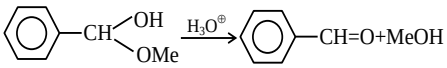
(2) Statement I is correct but Statement II is incorrect.

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

(4) Both Statement I and Statement II are incorrect

Ans. **(3)**

Sol. $R-CH=O + H_2N-NH-\underset{\underset{O}{\|}}{C}-NH_2 \xrightarrow{pH=4-6} R-CH=N-NH-\underset{\underset{O}{\|}}{C}-NH_2$



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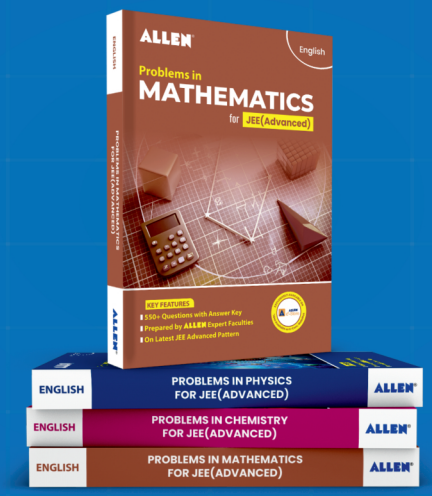

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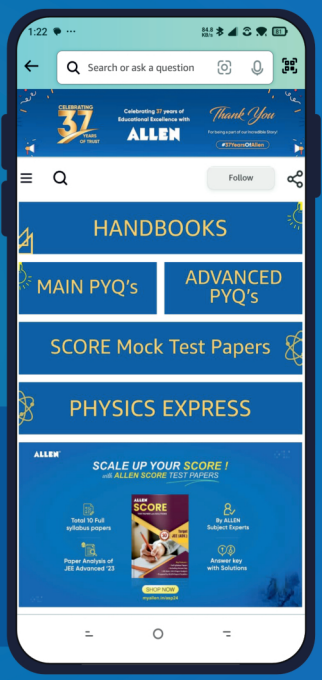

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