MEMORY BASED QUESTIONS JEE–MAIN EXAMINATION – APRIL 2026

(HELD ON THURSDAY 02nd APRIL 2026) **TIME : 3:00 PM TO 6:00 PM**

CHEMISTRY

TEST PAPER WITH SOLUTION

1. For first order reaction;

$2A(g) \rightarrow 4B(g) + C(g)$

Total pressure at t = 30 sec and t = ∞ are 300 torr and 600 torr respectively. Calculate pressure of C(g) at 30 sec (in torr).

Ans. **(20)**

Sol.

	$2A(g)$	$\rightarrow 4B(g)$	$+ C(g)$
	p°		
t = 30 sec	$p^\circ - 2x$	$4x$	x
$t = \infty$	–	$2p^\circ$	$p^\circ/2$

$p_\infty = 2p^\circ + p^\circ/2 = 600$

$5p^\circ/2 = 600$

$P^\circ = 240$ torr

At t = 30 sec, $p = 300 = p^\circ - 2x + 4x + x$

$300 = 240 + 3x$

$3x = 60$

$x = 20$

Pressure of C(g) = 20 torr.

2. 'x' be the osmotic pressure of solution formed by dissolving 1g of a protein (M = 50,000 g/mol) in 0.5 litre and 'y' be the osmotic pressure of solution formed by dissolving 2g of same protein in 1 litre at 300 K. If 'z' be the osmotic pressure of solution formed by mixing above two solutions. Then the value of 'x', 'y' and 'z' respectively are.

{Use : R = 0.083 lit-bar/K-mol}

(1) 9.96×10^{-4} bar, 9.96×10^{-4} bar, 4.48×10^{-4} bar

(2) 9.96×10^{-4} bar, 19.2×10^{-4} bar, 9.96×10^{-4} bar

(3) 19.2×10^{-4} bar, 19.2×10^{-4} bar, 19.2×10^{-4} bar

(4) 9.96×10^{-4} bar, 9.96×10^{-4} bar, 9.96×10^{-4} bar

Ans. **(D)**

Sol. $'x' = \dfrac{1}{50,000 \times 0.5} \times R \times 300 = 9.96 \times 10^{-4}$ bar

$'y' = \dfrac{2}{50,000 \times 1} \times R \times 300 = 9.96 \times 10^{-4}$ bar

$'z' = \dfrac{'x' \times \frac{1}{2} + 'y' \times 1}{\frac{3}{2}} = 9.96 \times 10^{-4}$ bar

3. Molarity of H_2SO_4(aq.) solution is 4.9 M. If density of solution is 1.40 g/ml, then molality and mole fraction of solute in the solution is :

(Molar mass of H_2SO_4 = 98 gm/mole)

(1) m = 5.33, x_{solute} = 0.072

(2) m = 5.33, x_{solute} = 0.087

(3) m = 5.21, x_{solute} = 0.072

(4) m = 5.21, x_{solute} = 0.087

Ans. **(2)**

Sol. $m = \dfrac{1000 \times M}{1000\,d - M.M_{H_2SO_4}}$

$= \dfrac{1000 \times 4.9}{1000 \times 1.40 - 4.9 \times 98}$

$\Rightarrow \dfrac{4900}{1400 - 480.2} \Rightarrow \dfrac{4900}{919.8} = 5.327$ 'm'

Mole fraction x

$= \dfrac{5.327}{5.327 + 55.56} = \dfrac{5.327}{60.887} = 0.087$

4. A metal of work function 2.3 eV is irradiated with radiation of wave-length y × 10^2 nm. $(KE)_{max}$ of ejected electron is 2.8×10^{-20} J, then calculate y. (in nearest integer)

Ans. **(5)**

Sol. KE of electron = 2.8×10^{20} J

$= \dfrac{2.8 \times 10^{-20}}{1.6 \times 10^{-19}} = 0.175$ eV

$\because (KE)_{max} = \left[\dfrac{1240 \text{ eV.nm}}{\lambda \text{ (in nm)}} - \phi\right]$

$= 0.175 = \dfrac{1240}{\lambda} - 2.3$

$\lambda = \dfrac{1240}{2.475}$

$\lambda = 501.01$ nm

$\lambda = 5.01 \times 10^2$ nm

5. A hydrocarbon has mass ratio of C and H in 12 : 1. Each molecule of hydrocarbon has 2 carbon atoms. Calculate mass of CO_2 (in gm) produced, when 3.38 gm hydrocarbon undergoes combustion.

(1) 11.44

(2) 22.88

(3) 3.28

(4) 6.44

Ans. **(1)**

Sol. Molecular formula of hydrocarbon is C_2H_2

$$\text{Moles of } C_2H_2 = \frac{3.38}{26}$$

$$C_2H_2(g) + \frac{5}{2}O_2(g) \rightarrow 2CO_2(g) + H_2O(l)$$

$$\text{Moles of } CO_2 \text{ produced} = \left(\frac{3.38}{26} \times 2\right)$$

$$\text{Mass of } CO_2 \text{ produced} = \left(\frac{3.38}{26} \times 2\right) \times 44 = 11.44$$

6. A cell is formed using below half-cell reactions and cell is working with 80% efficiency. Work obtained is utilised for isothermal expansion of gas against external pressure of 1 kPa. Find ΔV (in m^3)

$\frac{1}{2}O_2 + 2H^+ + 2e^- \rightarrow H_2O$; $E° = 1.23$ V

$6H^+ + CO_2 + 6e^- \rightarrow CH_3OH + H_2O$ $E° = 0.02$V

Ans. **(560)**

Sol. $\Delta G° = -6 \times 96500 \times 1.21$ J

$$W = \frac{80}{100} \times \Delta G° = -P\Delta V$$

$$0.8 \times 6 \times 96500 \times 1.21 = 1 \times 10^3 (\Delta V)$$

$$\Delta V = 560.472 \text{ m}^3$$

7. For process X → Y work done by the gas is 10 J and heat absorb in the process is 2 J. For reverse process heat evolved is 6 J. Find work done for reverse process.

(1) Work done on the gas is 14 J.

(2) Work done by the gas is 2 J.

(3) Work done on the gas is 20 J.

(4) Work done by the gas is 12 J.

Ans. **(1)**

Sol. For process X → Y

$w = -10$ J

$q = +2$ J

$\Delta U = q + w$

$\Delta U_{X \rightarrow Y} = 2 - 10 = -8$ J

For reverse process :

$\Delta U_{Y \rightarrow X} = 8$ J

$q = -6$ J

$\Delta U = q + w$

$8 = -6 + w$

$w = 14$ J

8. For a reaction

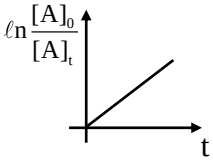
$xA \rightarrow yB$, $k = 0.3\ M^{-1}\ sec^{-1}$

(i) If the concentration of A is made 4 times then rate of reaction becomes 16 times.

(ii) The decomposition of N_2O_5 is an example of this type of reaction

(iii) The order of reaction is 2

(iv) A plot of $\ell n\frac{[A]_0}{[A]_t}$ vs t is straight line



(v) The half life of the reaction is independent of the concentration of the reactant.

Which of the following option has correct set of statement :-

(1) (i), (ii), (v) (2) (i), (iii)

(3) (iii), (iv), (v) (4) (i), (iii), (v)

Ans. **(2)**

Sol. Rate of constant (k) = 0.3 M^{-1} sec^{-1}

$\because$ 1 – n = –1 [unit of k = M^{1-n} sec^{-1}]

n = 2 $\Rightarrow$ 2nd order reaction

rate = $k[A]^2$

(i) If concentration of A is 4 times then reaction will become 16 times.

(ii) Decomposition of N_2O_5 is example of 1st order reaction

(iii) Order of reaction is 2

(iv) Graph of $\ell n\frac{[A]_0}{[A]_t}$ vs t is straight line for 1st order not for 2nd order reaction.

(v) Half-life of the reaction is independent of the concentration of the reactant for 1st order, not for 2nd order reaction.

So statement (i), (iii) are correct

So option (2) is correct option

9. 0.1 mole of H_2S is added in 1 litre of 0.1 HCl solution. Calculate concentration of HS^-.

[Given $Ka_1 = 8.3 \times 10^{-8}$ & $Ka_2 = 10^{-13}$]

(1) 8.3×10^{-8} M (2) 10^{-13} M

(3) 0.1 M (4) 0.05 M

Ans. **(1)**

Sol.

$$\underset{0.1M}{HCl} \rightarrow \underset{0.1M}{H^+} + \underset{0.1M}{Cl^-}$$

$$\underset{0.1-x}{H_2S} \rightleftharpoons \underset{x+0.1}{H^+} + \underset{x}{HS^-}$$

(Due to common ion effect x is very less)

$$Ka_1 = \frac{[H^+][HS^-]}{[H_2S]}$$

$$Ka_1 = \frac{0.1\times[HS^-]}{0.1}$$

$[HS^-] = Ka_1 = 8.3 \times 10^{-8}$

10. 20 ml of 0.2 M HA ($K_a = 5 \times 10^{-4}$) is titrated with 10 ml of 0.2 M NaOH solution. Calculate initial & final value of pH of solution? [Given log5 = 0.7]

(1) 2, 3.3 (2) 1.65, 2

(3) 3.3, 2 (4) 2, 3.6

Ans. **(A)**

Sol. For 0.2M, 20ml HA solution,

pH of weak acid = $\frac{1}{2}[pk_a - \log c]$

$= \frac{1}{2}[4 - \log 5 - \log 0.2]$

$= \frac{1}{2}[4 - \log 5 + \log 5]$

$= 2$

$$\underset{20\text{ ml, }0.2\text{ M}}{HA} + \underset{10\text{ ml, }.02\text{ M}}{NaOH} \xrightarrow{(LR)} NaA + H_2O$$

4mmole 2mmole

2mmole – 2mmole

[HA + NaA] $\Rightarrow$ acidic buffer

$pH = pK_a + \log\frac{\text{salt}}{\text{acid}}$

$pH = 3.3 + \log\frac{2}{2}$

pH = 3.3

so, option (1) is correct

11. How many of the following are paramagnetic :

Lu^{3+} , Yb^{2+} , Gd^{2+} , Ce^{4+} , La^{3+} , Zn^{2+} , Cu^{2+} , Mn^{2+} , Sc^{3+} and Ti^{4+}

Ans. **(3)**

Sol. Paramagnetic species are : Gd^{2+}, Cu^{2+} and Mn^{2+}

12. Which of the following are iso-structural with SF_4?

(A) $IF_4^{\oplus}$ (B) $BrF_4^{\ominus}$

(C) XeO_2F_2 (D) CH_4

(E) XeF_4

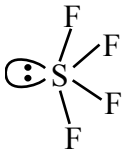
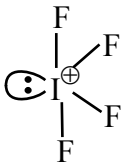
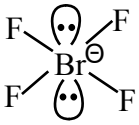
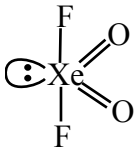
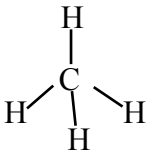
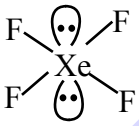
Correct option is _____

(1) A, B & E (2) A, C & E

(3) A & C only (4) B & E only

Ans. **(3)**

Sol.

Species	Structure / Shape
SF_4	 → see-saw
$IF_4^{\oplus}$	 → see-saw
$BrF_4^{\ominus}$	 → square planar
XeO_2F_2	 → see-saw
CH_4	 → Tetrahedral
XeF_4	 → square planar

13. The correct set that contains all kinds of oxides (Basic, acidic, amphoteric and neutral) is :-

(1) Na_2O , N_2O , Al_2O_3 & CO

(2) Al_2O_3 , As_2O_3 , CO , & NO

(3) K_2O , Cl_2O_7 , As_2O_3 & NO

(4) Na_2O , K_2O , Al_2O_3 & As_2O_3

Ans. **(3)**

Sol. Basic Oxides : Na_2O , K_2O

Acidic Oxides : Cl_2O_7

Neutral Oxides : N_2O , NO & CO

Amphoteric Oxides : Al_2O_3 , As_2O_3

14. Statement 1 : The correct order of 2nd ionization energy for boron family elements is : B > Al > Ga.

Statement 2 : The correct order of 1st ionization energy for carbon family elements is : Si > Ge < Pb < Sn.

Choose the correct option :

(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. **(4)**

Sol. Order of II ionization energy for boron family elements is :

$$\underset{(2427\ KJ/mol)}{B} > \underset{(1979\ KJ/mol)}{Ga} > \underset{(1816\ KJ/mol)}{Al}$$

Order of I ionization energy for carbon family elements is :

$$\underset{(786\ KJ/mol)}{Si} > \underset{(761\ KJ/mol)}{Ge} > \underset{(715\ KJ/mol)}{Pb} > \underset{(708\ KJ/mol)}{Sn}$$

15. Which of the following compounds shows coordination isomerism.

(A) $[Fe(NH_3)_6]\ [Co(CN)_6]$

(B) $[Cr(NH_3)_6]\ [Co(CN)_6]$

(C) $[Co(NH_3)_6]\ [Co(CN)_6]$

(D) $[Ag(NH_3)_2]\ [Ag(CN)_2]$

(E) $[Fe(NH_3)_6]\ [Cr(CN)_6]$

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

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

Ans. (3)

Sol. Compound, $[Ag(NH_3)_2]\ [Ag(CN)_2]$ cannot show coordination isomerism.

16. Arrange the following complexes in increasing order of C.F.S.E. (Δ_0)

(a) $[Co(H_2O)_6]^{2+}$

(b) $[Co(H_2O)_6]^{3+}$

(c) $[Co(en)_3]^{3+}$

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

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

Ans. (C)

Sol. C.F.S.E. is proportional to charge on central metal ion.

For same charge on central atom ; C.F.S.E. is proportional to strength of ligand.

17. Which of the ions show positive Borax Bead test and has the largest ionization energy :

(1) Zn^{2+} (2) Fe^{3+}

(3) Fe^{2+} (4) Co^{2+}

Ans. (B)

Sol. Zn^{2+} does not show Borax Bead Test.

Among remaining ions; Fe^{3+} has maximum ionization energy.

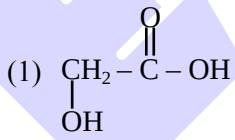
18. Identify code of amino acid and iodine derivative hormone in given option

Code	Hormone
(1) Y	Insuline
(2) T	Thyroxine
(3) Y	Thyroxine
(4) T	Insuline

Ans. (3)

Sol. Thyroxine is derivative of Tyrosine and single letter symbol of Tyrosine amino acid is Y.

19. $\underset{(X)}{\text{Organic compound}} + KOH \xrightarrow{H^{\oplus}}$ gives product $\begin{pmatrix}\text{having same molar}\\ \text{ratio of C : H : O}\end{pmatrix}$ 'P'. Identify product 'P'

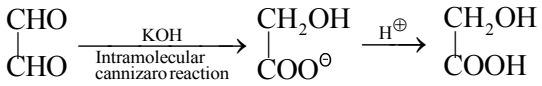
(1) 

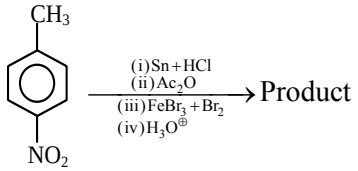
(2) $CH_3 - COOH$

(3) $CH_2 = CH - COOH$

(4) 

Ans. (1)

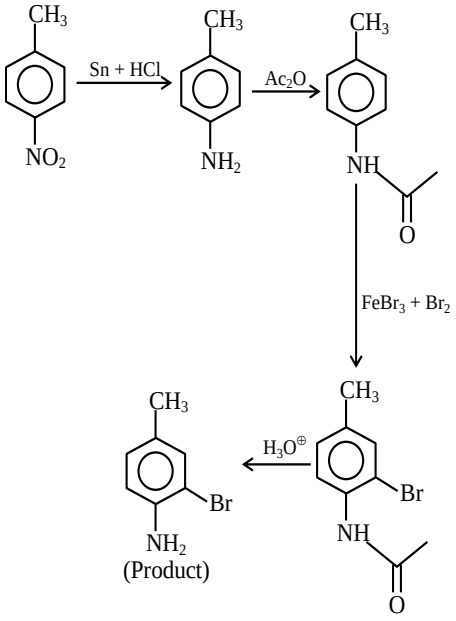
Sol. 

20. 

What will be mass of AgBr obtained when 1 gm of product treated with $AgNO_3$ in Carius method.

Ans. (1)

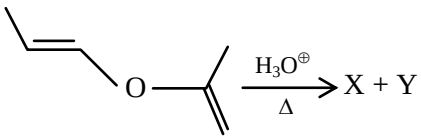
Sol.



Molar mass of product = 186

Mass of AgBr = $\frac{1}{186}\times 188 \approx 1$

21.



Correct statement about product X and Y?

(a) They can be differentiated by $NaHCO_3$ test.

(b) They both gives 2,4-DNP test

(c) They both have same molecular mass.

(d) They both react with same rate with HCN

(1) Statement a and b are correct

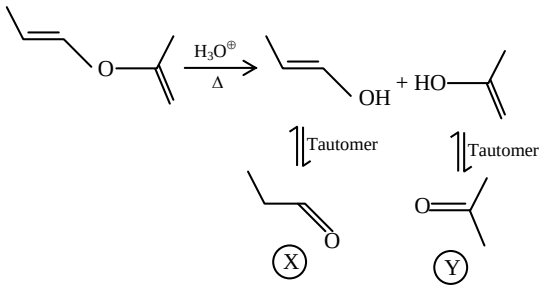
(2) Statement b and c are correct

(3) Statement c and d are correct

(4) Statement a and d are correct

Ans. (2)

Sol.



A will give positive fehling's test

Molar mass of [X] $(C_3H_6O) = 58$

Molar mass of [Y] $(C_3H_6O) = 58$

22. Identify correct statement(s)

(i) Ar–Cl and R–Cl shows similar chemical properties.

(ii) Rate of S_N1 $C_6H_5CH_2-Cl < C_6H_5-\underset{\displaystyle Cl}{\underset{|}{CH}}-C_6H_5$

(iii) Alcohol is more polar than water so alcoholic KOH show elimination reaction.

(iv) Vinyl alcohol is an alkene whereas allyl alcohol is an alkyne.

(v) Alcohol with $SOCl_2$ gives alkyl halide but phenol does not gives.

(1) i, ii, iii statements are correct

(2) i, iii, iv statements are correct

(3) ii and v statements are correct

(4) ii and iv statements are correct

Ans. (3)

Sol. (i) Ar-Cl and R–Cl shows different chemical properties

(ii) Rate of $S_N^1 \propto$ stability of first formed carbocation

Stability : $C_6H_5-\overset{\oplus}{C}H_2 < C_6H_5-\overset{\oplus}{C}H-C_6H_5$

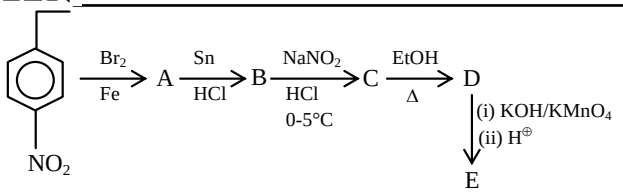
(iii) Water is more polar than alcohol

(iv) vinyl alcohol, allyl alcohol, both are unsaturated alcohols

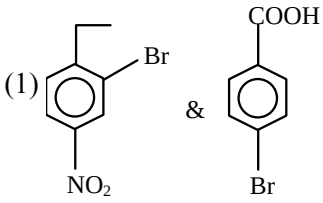
(v) $R-OH \xrightarrow{SOCl_2} R-Cl$

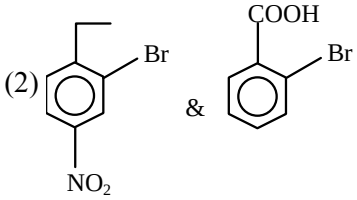
Phenol does not give Ph–Cl with $SOCl_2$.

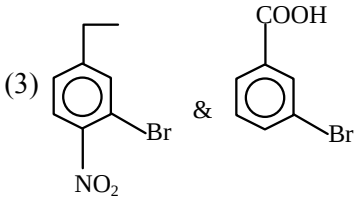
23.

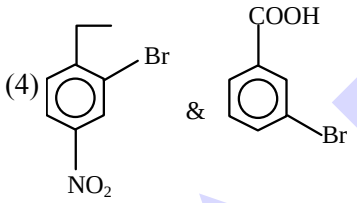


Identify A and E

(1) 

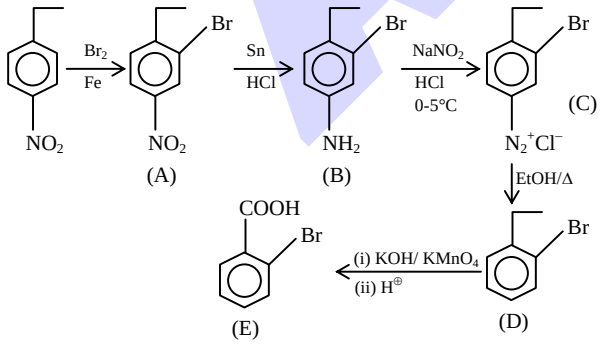
(2) 

(3) 

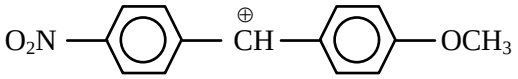
(4) 

Ans. (2)

Sol.

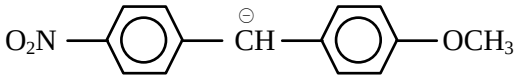


24. **Statement I :**



carbocation stable by ⊕R effect of $-OCH_3$ group.

Statement II :



carbanion stable by ⊖R effect of $-NO_2$ group.

(1) Both statement 1 and statement 2 are correct

(2) Statement 1 is correct and statement 2 is incorrect

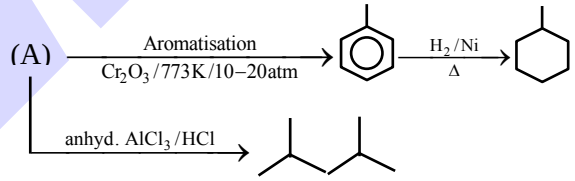
(3) Statement 1 is incorrect and statement 2 is correct.

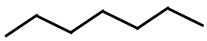
(4) Both statement 1 and statement 2 are incorrect

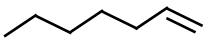
Ans. (1)

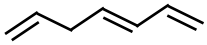
Sol. Both statements are correct

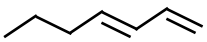
25. (A) is hydrocarbon



(1) 

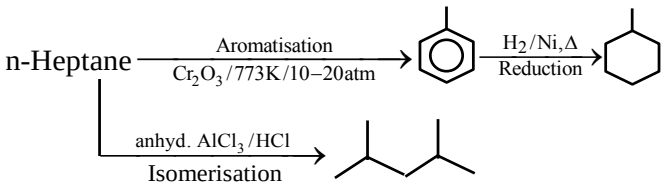
(2) 

(3) 

(4) 

Ans. (1)

Sol.



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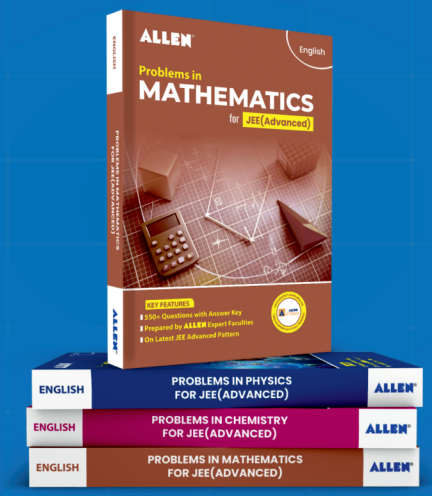

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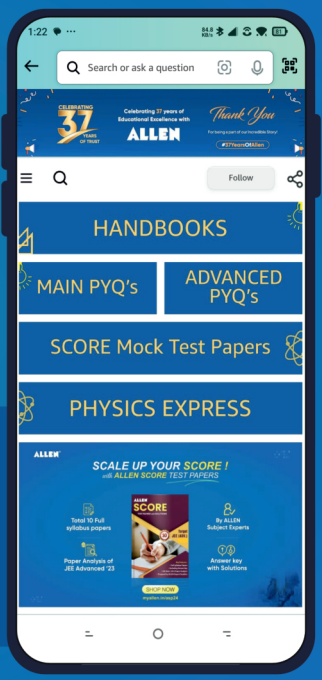

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