Resonance®
Educating for better tomorrow

JEE (MAIN) 2026

MEMORY BASED QUESTIONS & TEXT SOLUTION

SHIFT-1

DATE & DAY: 04th April 2026 & Saturday

PAPER-1

Duration: 3 Hrs.
Time: 09:00 – 12:00 IST

SUBJECT: CHEMISTRY

REGISTERED & CORPORATE OFFICE (CIN: U80302RJ2007PLC024029):
CG Tower, A-46 & 52, IPIA, Near City Mall, Jhalawar Road, Kota (Rajasthan) - 324005
0744-2777777 | 73400 10345 | contact@resonance.ac.in | www.resonance.ac.in | Follow Us: @ResonanceEdu | @Resonance_Edu

PART : CHEMISTRY

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

(1) $\frac{1}{0.09}$ (2) $\frac{0.81}{5}$ (3) $\frac{5}{0.81}$ (4) 0.09

Ans. **(3)**

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

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

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

2. The reaction follow 1^{st} order reaction

$$R \rightarrow P$$

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 1^{st} order reaction

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

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

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

3. For the reaction

$A + B \rightleftharpoons C\ K_p = 2.7\times10^{-5}$

Calculate K_p for the reaction

$\frac{1}{3}A + \frac{1}{3}B \rightleftharpoons \frac{1}{3}C$

(1) 3×10^{-3}

(2) $\frac{1}{3}\times10^{-3}$

(3) 9×10^{-3}

(4) 3×10^{-2}

Ans. **(4)**

Sol. $A + B \rightleftharpoons C\ K_p = 2.7\times10^{-5}$

$\frac{1}{3}A + \frac{1}{3}B \rightleftharpoons \frac{1}{3}C \Rightarrow K_p' = (K_p)^{1/3}$

$K_p' = (2.7\times10^{-5})^{1/3}$

$K_p' = (27\times10^{-6})^{1/3}$

$K_p' = 3\times10^{-2}$

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

(1) $3.92\times10^{22}, 0.065$

(2) $3.92\times10^{23}, 0.65$

(3) $1.96\times10^{22}, 0.033$

(4) $1.96\times10^{23}, 0.33$

Ans. **(1)**

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

Molecules $= 0.065\times N_A$

$= 3.92\times10^{22}$

5. 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) $\left(\frac{T_1T_2}{P_1V_1T_2+P_2V_2T_1}\right)\cdot\frac{1}{PV}$

(2) $\left(\frac{T_1T_2}{P_1V_1T_2+P_2V_2T_1}\right)\cdot PV$

(3) $\left(\frac{P_1V_1T_2+P_2V_2T_1}{T_1T_2}\right)\cdot PV$

(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

$n_1 + n_2 = n_f$

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

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

6. **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)**

7. **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 16^{th} 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 $O = +2$

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

8. Anion $X^{\ominus}$ 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.

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

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

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

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

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

Ans. **(2)**

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

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

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

10.

Column-I Complex	**Column-II** Spin only magnetic moment (in BM)
(A) $[Cr(H_2O)_6]^{3+}$	(P) 1.73
(B) $[Cu(H_2O)_6]^{2+}$	(Q) 3.87
(C) $[Mn(H_2O)_6]^{2+}$	(R) 0
(D) $[Co(H_2O)_6]^{3+}$	(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. $[Cr(H_2O)_6]^{3+} \rightarrow 3$ unpaired e^-; 3.87 BM

$[Cu(H_2O)_6]^{2+} \rightarrow 1$ unpaired e^-; 1.73BM

$[Mn(H_2O)_6]^{2+} \rightarrow 5$ unpaired e^-; 5.91BM

$[Co(H_2O)_6]^{3+} \rightarrow 0$ unpaired e^-; 0 BM

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

(B) $Na_2Cr_2O_7$ is used as primary standard solution in titration.

(C) $K_2Cr_2O_7$ oxidises Fe^{2+} into Fe^{3+} in acidic medium.

(D) CrO_4^{2-} and $Cr_2O_7^{2-}$ are intercomertible 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. $K_2Cr_2O_7$ is a good oxidising agent and bond angle of $Cr - O - Cr$ bond in $Cr_2O_7^{2-}$ is $126°$

$Na_2Cr_2O_7$ is not a primary standard.

In acidic medium $Cr_2O_7^{2-}$ exists and it get converted into CrO_4^{2-} in basic medium.

12. 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)	Cu_2Cl_2/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

13. Arrange the following groups according to their decreasing order of electron withdrawing nature - $COOH, -CN-1$ and $-NO_2$

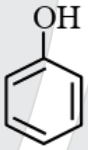
(1) $-CN > -NO_2 > -I > -COOH$
(2) $-NO_2 > -CN > -COOH > -I$
(3) $-COOH > -CN > -I > -NO_2$
(4) $-I > -COOH > -NO_2 > -CN$

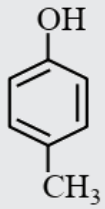
Ans. **(2)**

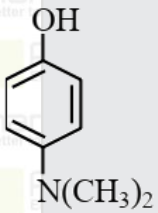
Sol. Theory based

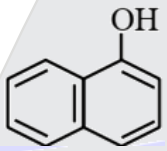
14. Soluble in aq. NaOH

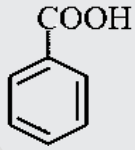
(A) 

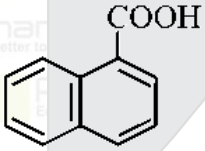
(B) 

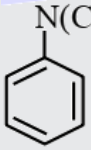
(C) 

(D) 

(E) 

(F) 

(G) 

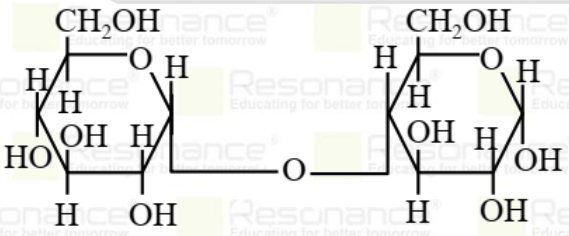
(H) 

(1) 4 (2) 5 (3) 6 (4) 7

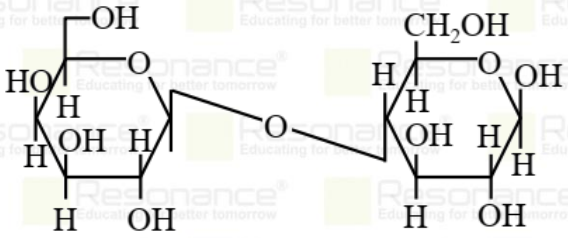
Ans. **(3)**

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

15. **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

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

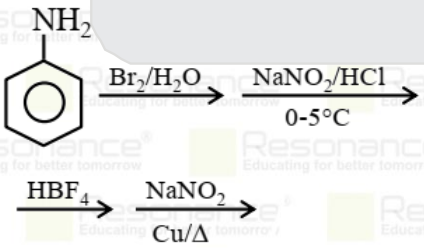
	Column-I (Name of amino acid)		**Column-II (One letter code)**
(A)	Arginine	(P)	K Essential
(B)	Lysine	(Q)	R Essential
(C)	Aspartic acid	(R)	D Non essential
(D)	Glutamic acid	(S)	E Non essential

(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.

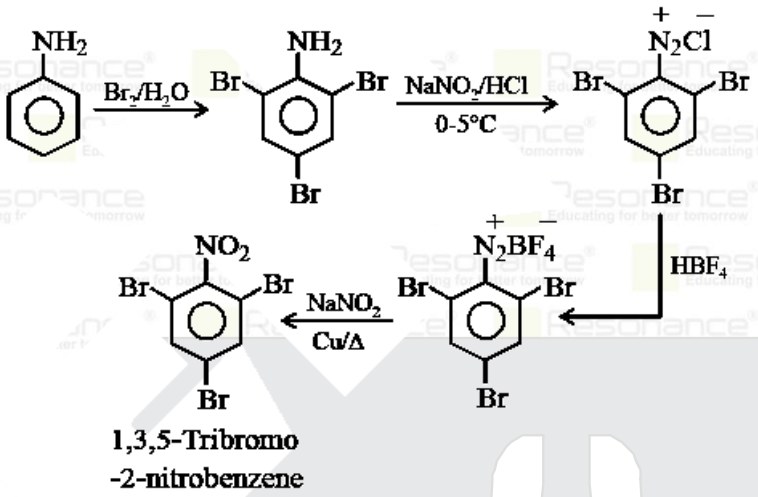
17. IUPAC Name of formed compound :



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

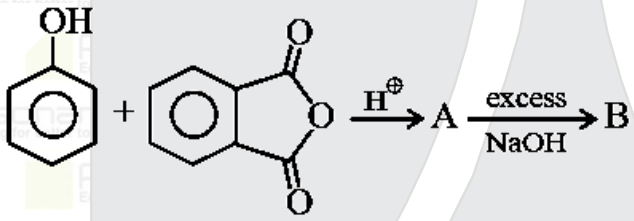
Ans. **(3)**

Sol.



1,3,5-Tribromo
-2-nitrobenzene

18. Consider following reaction :

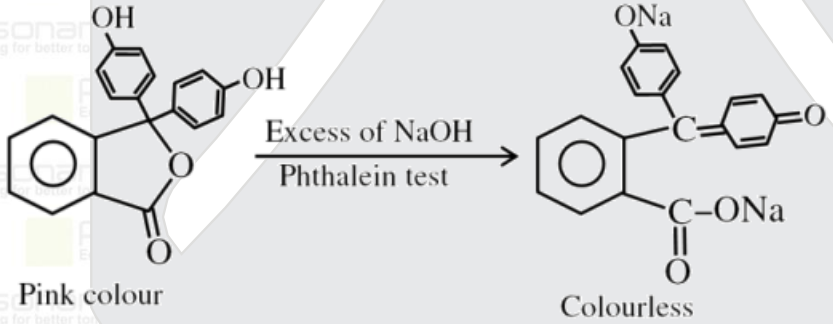


What is the colour of final compound B ?

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

Ans. **(3)**

Sol. A is Phenolphthalein



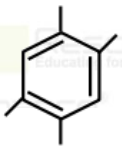
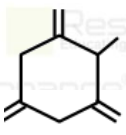
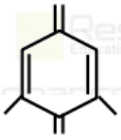
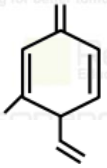
Pink colour

Colourless

19. (A) $\xrightarrow[Zn/H_2O]{O_3}$ $H-\overset{O}{\overset{\|}{C}}-H + CH_3-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-CH_3 + H-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-H$

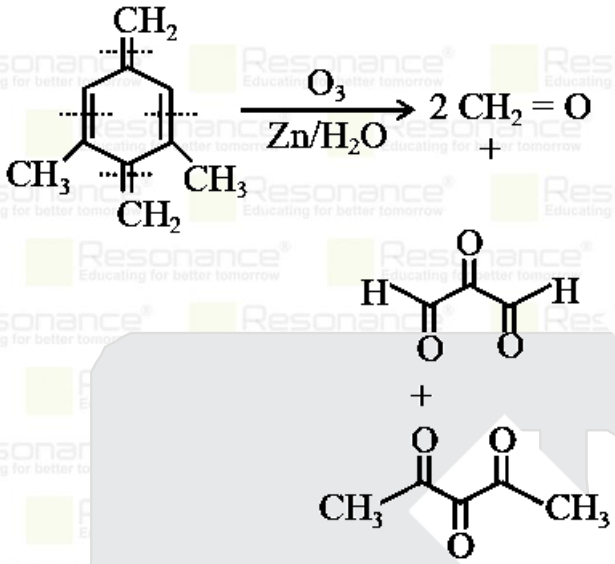
2 mole

Identify the structure of compound A .

(1)  (2)  (3)  (4) 

Ans. **(3)**

Sol.



20. Calculate number of moles of $KMnO_4$ needed to oxidise the mixture containing one mole each of $FeC_2O_4, FeSO_4, Fe_2(C_2O_4)_3, Fe_2(SO_4)_3$ in acidic medium

Ans. **(2)**

Sol. Meq. of $KMnO_4$ = Meq of $(FeC_2O_4 + FeSO_4 + Fe_2(C_2O_4)_3)$

moles $\times 5 = 1 \times 3 + 1 \times 1 + 1 \times 6$

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

moles $= 2$

21. 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 $= 0.3\ K - Kgmol^{-1}$):

Ans. **(5)**

Sol. $\frac{P°-Ps}{Ps} = i.\ \text{molality} \times \frac{(\text{M.solvent})}{1000}$

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

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

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

22. Solution of $5ml, 0.1MNH_3$ added with 250 ml , $0.1MNH_4Cl$ solution. Calculate $(pH \times 10^{-2})pK_b(NH_4OH) = 4.74(\log 5 = 0.7)$

Ans. **(756)**

Sol. On mixing final volume $= 255ml$

$[NH_3] = \frac{5 \times 0.1}{255}$

$[NH_4Cl] = \frac{250 \times 0.1}{255}$

$pOH = pK_b + \log\frac{[NH_4Cl]}{[NH_3]}$

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

$pOH = 6.44$

$pH = 14 - 6.44 = 7.56$

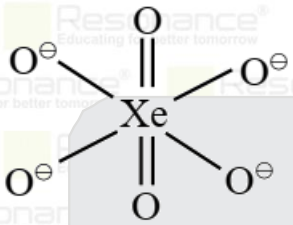
23. In the molecule XeO_6^{-4}; total number of lone pairs and σ bond pairs on central atom Xe are :-

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

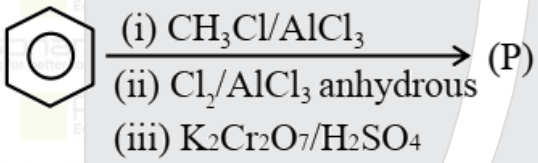
Sol. $XeO_6^{-4} \Rightarrow Xe = sp^3\ d^2$ hybridized .

bond pair $= 6$ [σ bonds]

lone pair $= 0$



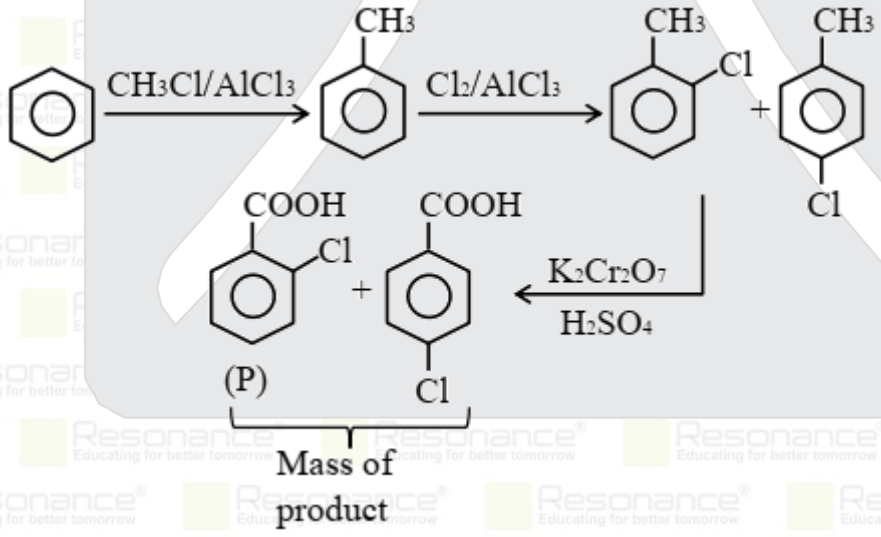
24.



When X gm of product P react with $NaHCO_3$, $11.2 dm^3 CO_2$ gas at STP is obtained. Find out the mass of P in gram.

Ans. **(78.25)**

Sol.



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

$M_{C_7H_5O_2Cl} = 156.5 gm$

$W_{P(C_7H_5O_2Cl)} = 156.5 \times 2 = 78.25$

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)**

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

r = no. of Br atoms in organic compound

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

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

$M = 1/2 \times x$

(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 $x = 2, n_C = 5$