

JEE MAIN CHEMISTRY SAMPLE PAPER-1 2020

**JEE MAIN
SAMPLE PAPER 1 - 2020**

**CHEMISTRY
SOLUTION**

Answer Key

- | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. | (C) | 2. | (C) | 3. | (A) | 4. | (C) | 5. | (D) | 6. | (A) | 7. | (D) |
| 8. | (A) | 9. | (B) | 10. | (B) | 11. | (C) | 12. | (D) | 13. | (C) | 14. | (D) |
| 15. | (C) | 16. | (D) | 17. | (B) | 18. | (B) | 19. | (B) | 20. | (D) | 21. | (B) |
| 22. | (A) | 23. | (A) | 24. | (B) | 25. | (C) | 26. | (C) | 27. | (A) | 28. | (B) |
| 29. | (D) | 30. | (A) | | | | | | | | | | |

1. (C) For a reaction $A \rightarrow P$

$$\ln \frac{k_2}{k_1} = \frac{E_A}{R} \left[\frac{1}{200} - \frac{1}{220} \right] = \ln 3$$

$$\ln \frac{k_2'}{k_1'} = \frac{E_B}{R} \left[\frac{1}{200} - \frac{1}{220} \right] = \ln 9$$

$$\frac{\ln 3}{\ln 3^2} = \frac{E_A}{E_B} \Rightarrow 2E_A = E_B$$

2. (C) $\text{AgCl} \rightleftharpoons \underset{\text{S}}{\text{Ag}^+(\text{aq})} + \underset{\text{S}}{\text{Cl}^-(\text{aq})}$

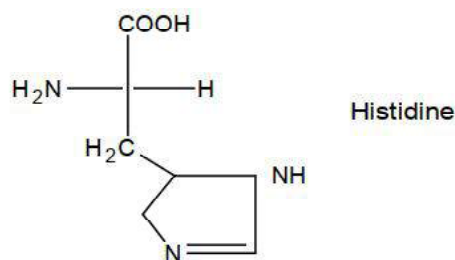
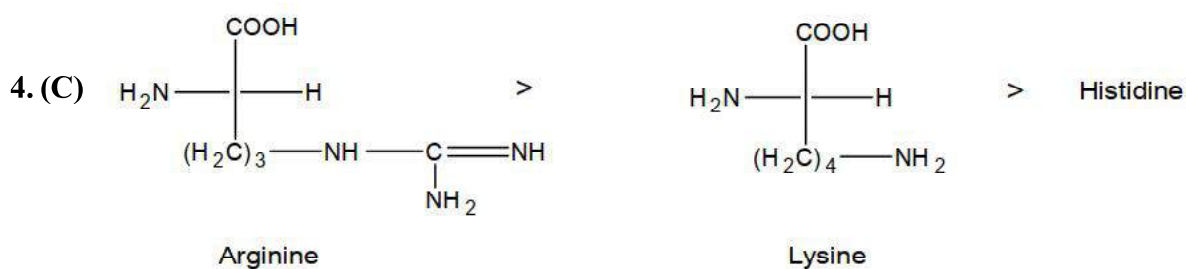
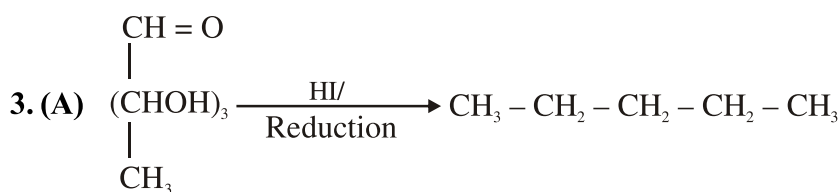
$$K_{\text{sp}} = S^2 = 2.56 \times 10^{-10} = 256 \times 10^{-12}$$

$$S = 16 \times 10^{-10} = 256 \times 10^{-12}$$

$$S = 16 \times 10^{-6} = 1.6 \times 10^{-5} \text{ mol/L}$$

$$1.6 \times 10^{-5} = \frac{0.01}{\text{Vol(L)}}$$

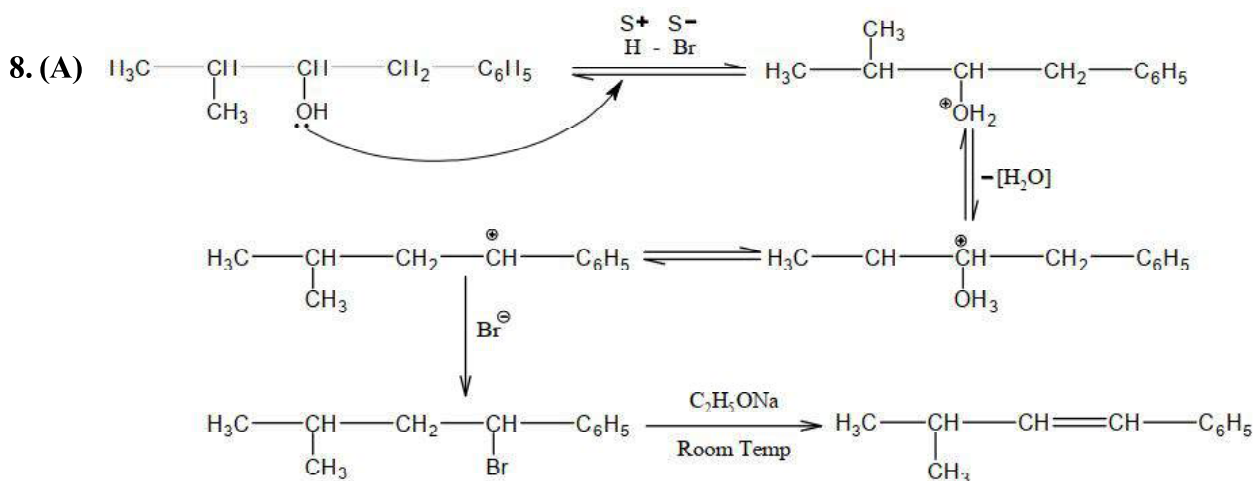
$$V = \frac{0.01}{1.6 \times 10^{-5}} = 625 \text{ L}$$



5. (D) $[\text{M}(\text{H}_2\text{O})_2(\text{NH}_3)_2\text{Cl}_2]$ - complex show optical isomerism

6. (A) Not possible due to free rotation around C-C bond.

7. (D) β -form has higher m.p. than α -form



9. (B) $\log k = 14 - \frac{1.2 \times 10^4}{T} \dots (i)$

$$\log k = \log A - \frac{E_a}{2.303RT}$$

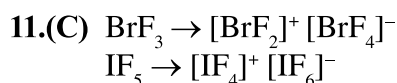
$$t_{1/2} = 6.93 \times 10^{-3} \text{ min}$$

$$k = \frac{0.693}{6.93 \times 10^{-3}} = 100$$

$$\log 100 = 14 - \frac{1.2 \times 10^4}{T}$$

$$\Rightarrow T = 1000\text{K}$$

10. (B) Reaction (I) undergoes NGP, S_N2 and S_N1 ; while reaction (II) follows mainly S_N1 paths

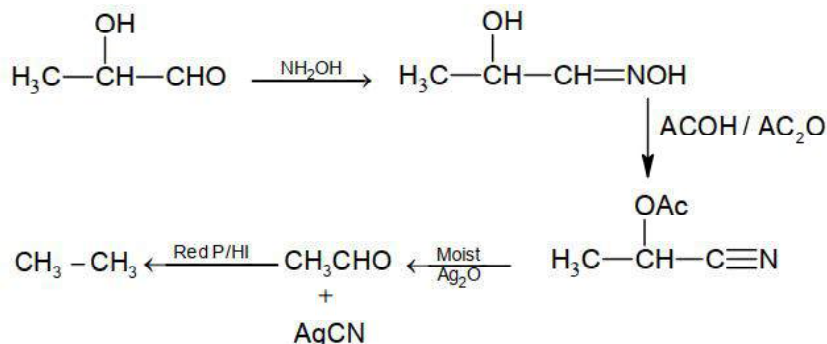


12. (D) (I) Migratory aptitude of 1o alkyl > methyl group when carbocation is formed.

(II) Free carbocation formation is unfavourable in the given condition and in S, angle strain also increases much.

(III) Free carbocation is not formed under given conditions and departure of H_2O is assisted by phenyl group.

13. (C) Products of reactions I, II & III is propane while that of reaction IV is ethane



14.(D) $\text{NH}_3^+ - \text{CH}_2 - \text{COO}^-$ (glycine) is amphoteric

$$\text{Hence, pH} = \text{pI} = \frac{2.4 + 9.54}{2} = 5.97$$

15.(C) Number of electrons exchanged = 12 (for 3Sn)

$$E_{cell}^0 = 0.009 + 1.33 = 1.339 = \frac{0.0591}{12} \log k_{eq}$$

$$K_{eq} = 10^{271.878}$$

$$= 10^{272}$$

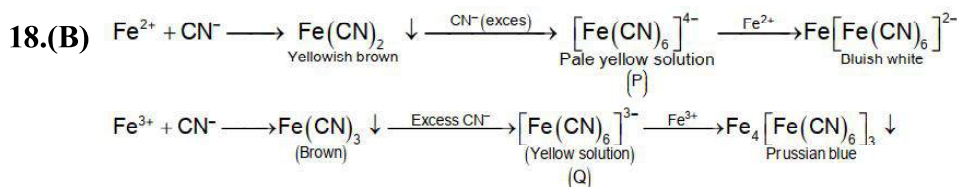
16.(D) Graph in A is plotted for endothermic reaction and graph in B is plotted for exothermic reactions actually.

$$(C) E_{a_1} < E_{a_2} < E_{a_3}$$

17.(B) Using Rault's law

$$P_A^0 = 1000 \text{ mm Hg and } P_B^0 = 800 \text{ mm Hg}$$

As 'A' is more volatile, hence (A) and (D) are incorrect. In case of 'C' $P_A = 0.3 \times 1000 = 300 \text{ mm Hg}$.



19.(B) Without defect formula of the compound would be : $\text{AB}_3\text{C}_4\text{D}_4$.

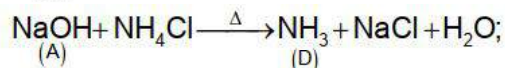
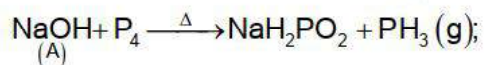
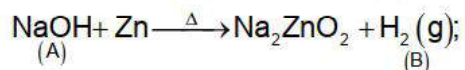
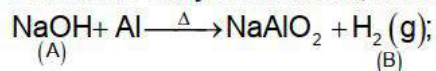
Due to defect

Missing particles per unit cell are

A	B	C	D
1/4	0	1	1

Hence the formula is $\text{A}_{3/4}\text{B}_3\text{C}_3\text{D}_3$ or $\text{AB}_4\text{C}_4\text{D}_4$.

20.(D) Devarda's alloy contains Al, Zn & Cu



21.(B) $10^{13} e^{-\frac{E_a}{RT}} = 10^{14} e^{-\frac{E_{a2}}{RT}}$

$$T = 230 \text{ K}$$

22.(A) Orbital angular momentum per electron $\frac{\sqrt{l(l+1)} h}{2}$
 $\frac{\sqrt{2(2+1)} h}{2}$
 $\sqrt{6}h$

For Fe^{3+} ;



Q Total orbital angular momentum in Fe^{3+} salt (per molecule) = $5\sqrt{6}h$

23.(A) $\frac{r_+}{r_-} = 0.414$ to 0.732 (C.N = 6)

$\frac{r_+}{r_-} = 0.225$ to 0.414 (C.N = 4)

Hence option (A) correct.

24.(B) For triatomic gas
 $\gamma = 1.33$, $C_p = 4R$

$$T_2 = T_1 \left(\frac{V_1}{V_2} \right)^{\gamma-1}$$

$$= 300 \left(\frac{5}{40} \right)^{\frac{1}{3}}$$

$$= 300 \left(\frac{1}{8} \right)^{\frac{1}{3}} = 300 \times \frac{1}{2} = 150$$

$$\Delta H = n \times C_p (T_2 - T_1)$$

$$= 3 \times 4 \times 8.314 (150 - 300)$$

$$= -14.965 \text{ kJ}$$

25.(C) $\frac{P_1 V_1}{T_1} = \frac{2P \times 2V_1}{T_2}$ $4T_1 \times n_1 = T_2 n_2'$

$$T_2 = 4T_1 \quad 4T_1 n_1 = T_2 \times \frac{5}{4} n_1 \left(n_2 = n_1 + \frac{n_1}{4} \right)$$

$$\text{Therefore } T_2' = \frac{16}{5} T_1$$

26.(C) Hoffman Bromide reaction

28.(B) (A) Be & Mg don't give flame test.
 (C) Ionisation energy and melting point of Li are higher.
 (D) Correct reducing character order is:
 $CsH > RbH > KH > NaH > LiH$

