

II - PVC Mid-term Examination Oct-2025

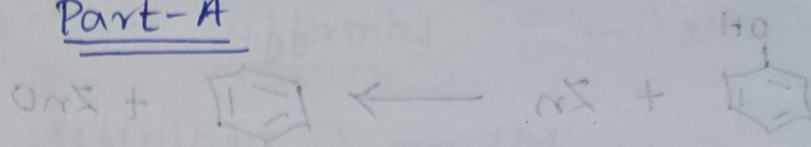
①

Subject: Chemistry (34)

Scheme of Valuation

Part-A

- I
1. b
 2. a
 3. b
 4. c
 5. b
 6. a
 7. b
 8. a
 9. d
 10. c
 11. d
 12. c
 13. c
 14. d
 15. a

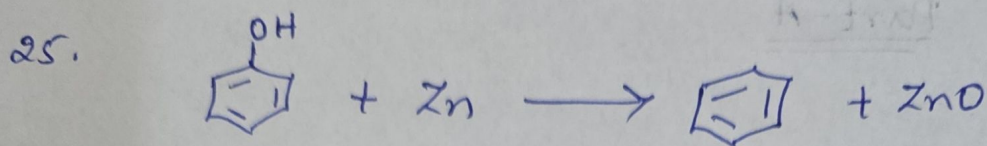
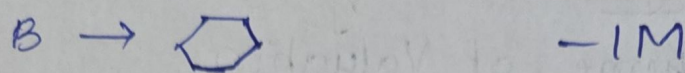
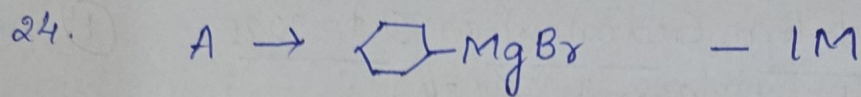


Part-B

- II
16. increases
 17. Swarts reaction
 18. Dry cell
 19. decreases
 20. Aspirin.

Part-B

- III
21. Statement — 2M
 22. Definition — 1M
Any one consequence — 1M
 23. Cis-isomer — 1M
trans-isomer — 1M.



phenol

Benzene

- 2M

Part-C

26.

Explanation with

orbital diagram - 1M

Geometry - 1M

Magnetic property - 1M

27.

Balanced chemical equations- each

Step carries - 1M.

- 3M

28.

a) $\text{Mn} - 1\text{M}$

b) $\mu = \sqrt{n(n+2)}$ } - 1M

$n = 5$

$\mu = \sqrt{5(5+2)}$

$\mu = 5.91\text{BM} - 1\text{M}$

29.

a) Any two postulates - 2M

b) Any one example - 1M

30.

a) triamminetriaquachromium(III) chloride - 1M

b) Any one example - 1M

c) eg orbitals - 1M

(2)

31. a) any two methods — 2M
 b) Correct Statement — 1M

32. Any three differences — 3M

33. a) definition — 1M
 Example — 1M

b) definition — 1M

34. a) $\text{Pt(s)} / \text{H}_2(\text{g}, 1\text{bar}) // \text{H}^+(\text{aq}, 1\text{M})$ — 1M

b) Cathode: $\text{O}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l}) + 4\text{e}^- \rightarrow 4\text{OH}^-(\text{aq})$ — 1M

Anode: $2\text{H}_2(\text{g}) + 4\text{OH}^-(\text{aq}) \rightarrow 4\text{H}_2\text{O}(\text{l}) + 4\text{e}^-$ — 1M

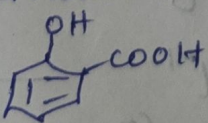
Part-D.

35. a) Correct mechanism & each step carries one mark — 2M

order = 1 — 1M

b) Explanation with Equation } — 2M
 Self-explanatory Equation }

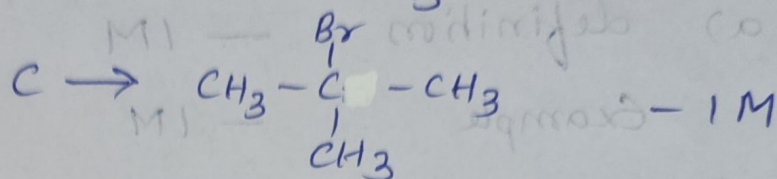
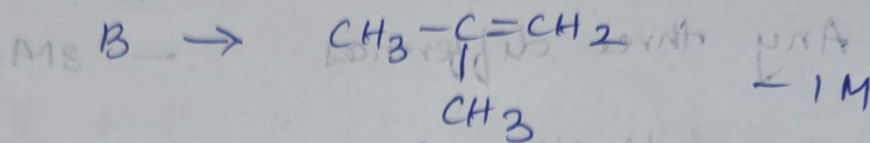
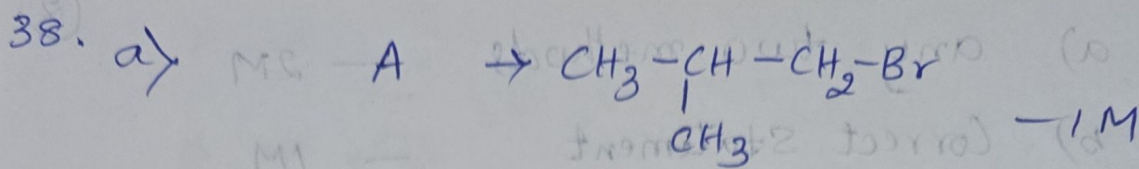
36. a) Explanation with equation — 3M

b)  — 1M

Kolbe's reaction. — 1M

37. a) Correct mechanism, each step — 1M — 3M

b) Conc. $\text{HCl} + \text{anhy ZnCl}_2$ — 1M
 Tertiary butyl alcohol — 1M



b) Any two reason -2M

39. a) definition -1M

Example -1M

b) definition -1M

reason -1M

c) one -1M

40. a) Explanation with Equation -2M

b) Explanation with Equation -2M

4-nitro anisole (or) p-nitroanisole -1M

Part-E [Numerical problems]

VII

41. $M_B = \frac{K_f \times w_B \times 1000}{\Delta T_f \times w_A} \quad -1\text{M}$

$= \frac{5.12 \times 1 \times 1000}{0.40 \times 50} \quad -1\text{M}$

$= 256 \text{ g mol}^{-1} \quad -1\text{M}$

42. No. of moles of Benzene $= \frac{(n_{\text{C}_6\text{H}_6})}{78} = \frac{20}{78} = 0.256 \text{ mol}$

$\text{CCl}_4 = \frac{80}{154} = 0.519 \text{ mol}$

$$\chi_{C_6H_6} = \frac{n_{C_6H_6}}{n_{C_6H_6} + n_{CCl_4}} = \frac{0.256}{0.256 + 0.519} = 0.3303 \quad \text{--- 1M} \quad \textcircled{3}$$

$$\begin{aligned} \chi_{CCl_4} &= 1 - \chi_{C_6H_6} \\ &= 1 - 0.3303 = 0.6696 \quad \text{--- 1M} \end{aligned}$$

$$\begin{aligned} 43. \quad \Delta G^\circ &= -nFE^\circ_{\text{cell}} \quad \text{--- 1M} \\ &= -2 \times 96487 \times 1.1 \quad \text{--- 1M} \\ &= -212271 \text{ J mol}^{-1} \quad \text{(or)} \quad -212.27 \text{ kJ mol}^{-1} \quad \text{--- 1M} \end{aligned}$$

$$\begin{aligned} 44. \quad E_{\text{cell}} &= E^\circ_{\text{cell}} - \frac{2.303RT}{nF} \log \frac{[Mg^{+2}]}{[Ag^+]^2} \quad \text{--- 1M} \\ &\quad \text{(or)} \\ E_{\text{cell}} &= E^\circ_{\text{cell}} - \frac{0.0591}{2} \log \frac{[Mg^{+2}]}{[Ag^+]^2} \quad \text{--- 1M} \end{aligned}$$

Substitution

$$E_{\text{cell}} = 2.9547 \text{ V} \quad \text{--- 1M}$$

$$\begin{aligned} 45. \quad \lambda^\circ_m(\text{CH}_3\text{COOH}) &= \lambda^\circ_m(\text{HCl}) + \lambda^\circ_m(\text{CH}_3\text{COONa}) - \lambda^\circ_m(\text{NaCl}) \quad \text{--- 1M} \\ &= 425.9 + 91.0 - 126.4 \quad \text{--- 1M} \\ &= 390.5 \text{ S cm}^2 \text{ mol}^{-1} \quad \text{--- 1M} \end{aligned}$$

$$\begin{aligned} 46. \quad Q &= It = 1.5 \times 10 \times 60 = 900 \text{ C} \quad \text{--- 1M} \\ \text{charge required to deposit one mole of} \\ \text{Copper from Cu}^{2+} \text{ ion is } 2F &= 2 \times 96487 \text{ C} \quad \text{--- 1M} \\ \therefore \text{mass of Copper deposited} &= \frac{63 \times 900}{2 \times 96487} \\ &= 0.2938 \text{ g} \quad \text{--- 1M} \end{aligned}$$