

I-PUC Mid-Term Examination Oct-2025 (1)

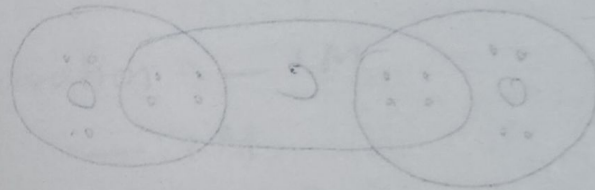
Subject: Chemistry (34)

Scheme of Valuation.

Part-A

I

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



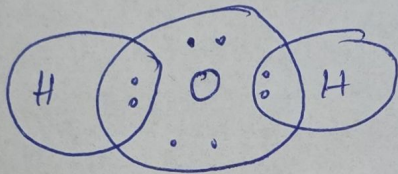
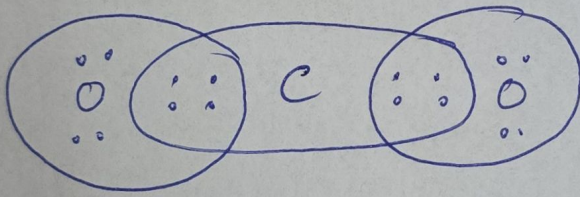
II

16. J.J. Thomson
17. Taxol
18. Electrophile
19. Octahedral
20. Lower

Part-B

III

21. Correct statement — 2M
22. i) — 2M
ii) — 5M
23. $\lambda = \frac{h}{mv}$ (or) $d = \frac{h}{p}$ — 1M

- Explaining terms — 1M
24. Correct statement — 2M
25. Definition — 1M
Suitable example — 1M
26. Statement — 2M
27. (i) Cl — 1M
(ii) P — 1M
28. Any 2 differences — 2M
29.  — 1M
 — 1M
30. for each example — 1M — 2M

Part-C

IV

31. a) Across period — increases — 1M
down the group — decreases — 1M
b) Fluorine — 1M
32. Correct Explanation — 3M
33. (i) $\sigma_{1s}^2 \sigma_{1s}^{*2} \sigma_{2s}^2$ — 1M
(ii) Bond order = $\frac{N_b - N_a}{2} = \frac{4 - 2}{2} = 1$ — 1M
(iii) Diamagnetic — 1M

34. i) pyramidal (or) Trigonal pyramidal — 1M
 ii) Trigonal bipyramidal — 1M
 iii) Tetrahedral — 1M

35. a) definition — 1M
 b) Reason — 2M

36. a) definition — 1M
 b) $10^{-9} \rightarrow$ nano — 1M
 $10^{-12} \rightarrow$ pico — 1M
 Any three postulates — 3M

38. Correct Configuration — 1M
 $n=4$ — 1M
 $l=0$ — 1M

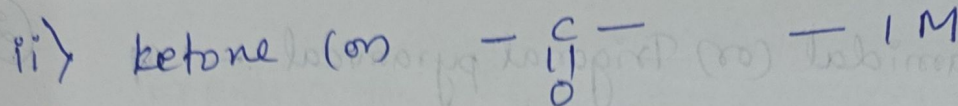
39. a) Correct Statement — 1M
 $\Delta U = q + w$ — 1M
 b) Zero — 1M

40. a) $\Delta H = \Delta U - 2RT$ — 1M
 b) Correct statement — 2M

Part-D

41. a) Explanation with Equation — 4M
 b) Any one element [N, S, P, (X=Cl, Br, I)] — 1M
42. i) Butane-2-one — 1M





iii) $\sigma = 12$, $\pi = 1$ — 2 M

43. a) Any two differences — 2 M

b) i) Chain isomerism — 1 M

ii) Metamerism — 1 M

c) Any one example — 1 M.

Part-E (Numerical Problems)

44.

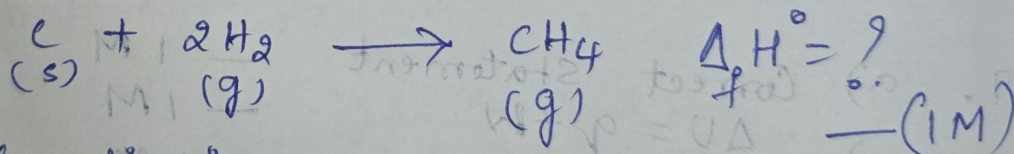
$$\log K = \frac{-\Delta G^\circ}{2.303RT} \quad \text{— 1 M.}$$

Substitution of Values — 1 M

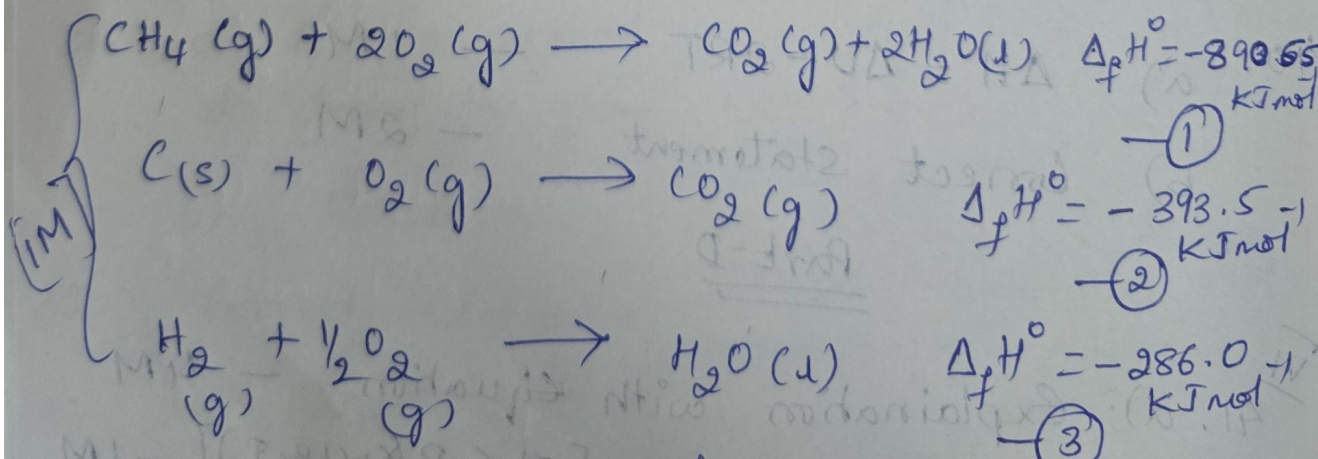
$$K = \text{antilog}(2.38) \quad \text{— 1 M.}$$

$$= 2.4 \times 10^2 \quad \text{— 1 M}$$

45. Required Equation:



Given Equation:



Applying Hess's law of Heat Summation
reversing eqn (1) + eqn (2) + 2 x eqn (3) — [1 M]

Final Answer $\Delta_f H^\circ = -74.85 \text{ kJ mol}^{-1}$ — [1 M]

46: wavenumber $\bar{\nu} = \frac{1}{\lambda} \quad \text{--- (1M)}$

$\bar{\nu} = 1.724 \times 10^6 \text{ m}^{-1} \quad \text{--- (1M)}$

frequency $\nu = \frac{c}{\lambda} \quad \text{--- (1M)}$

$\nu = 5.172 \times 10^{14} \text{ s}^{-1} \quad \text{--- (1M)}$

47.

Element	Atomic mass	%	$\frac{\text{No of At. mass}}{\text{molar \%}}$	$\frac{\text{No of moles}}{\text{Least count}}$	Simple whole no ratio
H	1	4.07	$\frac{4.07}{1} = 4.07$	$\frac{4.07}{2.01} = 2.02$	2
C	12	24.27	$\frac{24.27}{12} = 2.02$	$\frac{2.02}{2.02} = 1$	1
Cl	35.5	71.65	$\frac{71.65}{35.5} = 2.01$	$\frac{2.01}{2.02} = 0.99$	1

(E.F) Empirical formula = $\text{CH}_2\text{Cl} \quad \text{--- (1M)}$

Empirical formula mass = $12 + 2 \times 1 + 35.5$
 $= 49.5 \text{ g}$

$n = \frac{\text{molar mass}}{\text{Empirical formula mass}} = \frac{98.96}{49.5} \approx 2 \quad \text{--- (1M)}$

M.F = (E.F)_n
 $= (\text{CH}_2\text{Cl})_2 = \text{C}_2\text{H}_4\text{Cl}_2 \quad \text{--- (1M)}$

48. 188g of AgBr contains 80g of Br --- (1M)
 $\therefore 0.12 \text{ g} \quad \text{--- " --- " --- } \frac{80 \times 0.12}{188} \text{ g of Br} \quad \text{--- (1M)}$

$$\therefore \text{Percentage of Br} = \frac{80 \times 0.12 \times 100}{188 \times 0.15} \rightarrow (1M)$$

$$= 34.04\% \rightarrow (1M)$$

$$(M) \rightarrow 2.01 \times 10^{-2} = 2$$

Element	Atomic mass	%	No of atoms	Atom. mass	No of atoms	Simple whole no or ratio
H	1	4.07	$\frac{4.07}{1}$	4.07	$\frac{4.07}{10.6}$	2
C	12	26.18	$\frac{26.18}{12}$	2.18	$\frac{2.18}{10.6}$	1
O	16	22.17	$\frac{22.17}{16}$	1.39	$\frac{1.39}{10.6}$	1

(F) Empirical formula = C_2H_2O

2.28 + 1 + 2 = 5.48 = sum of atomic mass

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