

17. State Hund's rule of maximum multiplicity.
18. What are isoelectronic ions? Give example.
19. What is water-gas shift reaction?
20. Define Dalton's law of partial pressures.
21. Write the K_p and K_c for the following reaction.

$$2\text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2\text{SO}_3(\text{g})$$
22. What is sublimation?
23. What are Hyperconjugation?
24. If an automobile engine burns petrol at a temperature of 816°C and if the surrounding temperature is 21°C . Calculate its maximum possible efficiency.

PART-C**6 x 3 = 18****III. Answer any SIX questions : -****Question No. 33 is Compulsory**

25. Find the molar mass of the following
 (a) Urea (NH_2CONH_2) (b) Boric acid (H_3BO_3) (c) Sulphuric acid (H_2SO_4)
26. What is exchange energy?
27. Explain diagonal relationship.
28. What are ortho and para hydrogen?
29. What is entropy? Give its unit.
30. Distinguish between diffusion and effusion.
31. State Le-Chatelier principle.
32. Explain electromeric effect.
33. Give the structure for the following compound.
 (i) 3-ethyl-2-methyl-1-Pentene (ii) 3-Chlorobutanal. (iii) 3-methylbutan-2-ol.

PART-D**5 x 5 = 25****IV. Answer all questions :**

34. (a) (i) Define equivalent mass. (2)
 (ii) Balance the following equation by oxidation number method. (3)

$$\text{K}_2\text{Cr}_2\text{O}_7 + \text{KI} + \text{H}_2\text{SO}_4 \rightarrow \text{K}_2\text{SO}_4 + \text{Cr}_2(\text{SO}_4)_3 + \text{I}_2 + \text{H}_2\text{O} \quad [\text{OR}]$$
- (b) (i) Write a note on Aufbau principle (2)
 (ii) Write the assumptions of Bohr atom model. (3)
35. (a) (i) Define Modern Periodic law. (2)
 (ii) Explain the periodic trend of ionisation potential [OR] (3)
- (b) (i) Give the uses of heavy water. (2)
 (ii) What are the three types of Covalent hydrides. Give examples. (3)
36. (a) (i) State Boyle's law (2)
 (ii) What is Joule-Thomson effect? [OR] (3)
- (b) (i) State the third law of thermodynamics (2)
 (ii) List the characteristics of internal energy (3)
37. (a) (i) Define Gibb's free energy. (2)
 (ii) What are state and path functions? Give two examples. [OR] (3)
- (b) Derive the relation between K_p and K_c . (5)
38. (a) Give a brief description of the principles of (5)
 (i) Fractional distillation
 (ii) Column chromatography [OR]
- (b) What are electrophiles and nucleophiles? (5)
 Give suitable examples for each
