



VIIC

- 15) Which of the following species is not electrophilic in nature?  
 a)  $Cl^+$  b)  $BH_3$  c)  $H_3O^+$  d)  $NO_2^+$

**part - II**

**II. Answer any six questions. (Q.No. 24 is compulsory):**

**6×2=12**

- 16) Define basicity. What is the basicity of  $H_3PO_4$ ?  
 17) State Aufbau Principle.  
 18) Define Electron affinity.  
 19) Complete the following reactions:  
 i)  $Na_2O_2 + ? \rightarrow Na_2SO_4 + H_2O_2$   
 ii)  $Fe + H_2O \rightarrow ? + H_2$   
 20) What is meant by inversion temperature?  
 21) State Zeroth law of thermodynamics.  
 22) Define reaction quotient. (Q)  
 23) What is sublimation? Give examples.  
 24) If an automobile engine burns petrol at a temperature of 1089K and if the surrounding temperature is  $21^\circ C$ , Calculate its maximum efficiency.

**part - III**

**III. Answer any six questions. (Q.No. 33 is compulsory):**

**6×3=18**

- 25) Calculate the empirical formula of a compound containing 76.6% carbon, 6.38% hydrogen and rest is oxygen.  
 26) Give the electronic configuration of  $Mn^{2+}$  and  $Cr^{3+}$ .  
 27) Ionisation energy of Nitrogen is greater than that of oxygen. Why?  
 28) What is compressibility factor? Give the mathematical expression.  
 29) How do you convert para hydrogen into orthohydrogen?  
 30) Write any three characteristics of Gibbs free energy.  
 31) Explain metamerism with examples.  
 32) What are elimination reactions? Give examples.  
 33) Write the IUPAC name of the following compounds:  
 (i)  $CH_3 - CH - CH - CH_3$  (ii)  $CH_3 - O - CH_3$  (iii)  $CH_2 = CH - OH = CH_2$   
                   |      |  
                    $CH_3$   Br

**Part - IV**

**IV. Answer all the questions:**

**5×5=25**

- 34) a) Write a note on:  
 (i) Disproportionation reaction (ii) Metal displacement reaction  
**(OR)**  
 b) What are the features of Bohr atomic model?  
 35) a) Explain the Pauling's method of calculating Ionic Radii.  
**(OR)**  
 b) Write any five uses of Hydrogen.  
 36) a) i) What are the methods used for liquefaction of gases? **3**  
 ii) State Le-Chatlier's principle. **2**  
**(OR)**  
 b) Derive the relationship between  $K_p$  and  $K_c$ .  
 37) a) What are spontaneous reactions? What are the conditions for the spontaneity of a process?  
**(OR)**  
 b) i) What are homogeneous and heterogeneous equilibrium? Give examples. **3**  
 ii) Write the Graham's Law of Diffusion. **2**  
 38) a) i) What are functional groups? Give two examples. **2**  
 ii) Write the Lassaigne's test for halogens. **3**  
**(OR)**  
 b) i) Explain inductive effect with suitable example.  
 ii) Explain electromeric effect.