

**Q.P. Code :27542****[Time: Three Hours]****[ Marks:70]**

Please check whether you have got the right question paper.

- N.B: 1) Attempt all questions.  
2) Draw neat diagrams wherever necessary.

1. a. Write a note on liquid crystals and explain their significance. **3**
- b. Define specific Rotation and give applications of Polarimeter. **2**
- c. The boiling point of a solution containing 0.20g of substance X in 20g of ether is 0.17k higher than that of pure ether. Calculate the molecular mass of X. Boiling constant of ether per 1kg is 2.16k. **3**
- d. Define the following : **4**
  - i) Intensive property
  - ii) Closed system
  - iii) Isobaric process
  - iv) Isothermal process
- e. State and explain Faraday's laws of electrolysis. **3**
2. a. Explain Linde's method for Liquefaction of gases. **4**

**OR**

  - a. Explain the principle and method of liquefaction of gases by Claude's method.
  - b. Define Dipole moment. Write its applications. **3**
  - c. Derive the relation between  $C_p$  and  $C_v$ . **4**
3. a. Explain Raoult's law and discuss with the help of diagram positive and negative deviation from Raoult's law. **4**
- b. Define entropy and give different statements of Second law of thermodynamics. **4**

**OR**

  - b. An engine operating between 200°C and 75°C takes 500J heat from a high temperature reservoir. Assuming that there are no frictional losses, calculate the work that can be done by this engine.
  - c. Explain equivalent conductance of weak electrolyte at infinite dilution. **3**
4. a. What are ideal gases and real gases? Describe the deviations of real gases from the ideal gas equation. **4**
- b. Define refractive index. Discuss the principle and working of Abbe's refractometer. **3**
- c. Describe any one method to determine depression in freezing point as a colligative property. **4**

**OR**

  - c. With the help of diagram, discuss the relationship between elevation of b. p. and lowering of vapor pressure.

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5. a. Write a note on polymorphism. 4  
b. What is osmosis? Explain Berkeley and Hartley's method for measurement of osmotic pressure. 4  
c. Explain Hess's law of constant heat summation. 3
- OR**
- c. Define the following:  
i) Heat of solution  
ii) Heat of formation  
iii) Heat of combustion
6. a. Calculate the pressure exerted by 1.00 mole of methane (CH<sub>4</sub>) in a 250 ml container at 300k 3  
using Van der Waals equation.  
 $a = 2.253 \text{ L}^2 \text{ atm/mol}^2$   
 $b = 0.0428 \text{ L/mol}$   
 $R = 0.0821 \text{ L atm K}^{-1} / \text{mol}$   
b. Write a short note on Steam distillation. 3  
c. Write a note on Gibb's free energy. 3  
d. State the postulates of Arrhenius theory of electrolytic dissociation. 2

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