

GUJARAT TECHNOLOGICAL UNIVERSITY**B. E. Sem-III (Remedial) Examination May 2011****Subject code: 132603****Subject Name: Thermodynamics of Elastomers & Polymers****Date: 28/05/2011****Time: 10.30 am – 01.00 pm****Total Marks: 70****Instructions:**

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**

- Q.1** Answer the following **(14)**
- Give the difference between State function Vs. Path function.
 - Write the difference between Reversible & Irreversible process.
 - Define the term: (1) Degree of freedom (2) Entropy.
 - List the requirements for the system to be in Thermodynamic Equilibrium.
 - List the advantages of Liquid Fuel over Solid Fuel.
 - Define the term: (1) Net Calorific Value(NCV) (2) Gross Calorific Value(GCV)
 - The potential energy of a body of mass 10kg is 1.5 KJ. What is the height of the body from the ground if a body of mass 10 kg is moving at a velocity of 50 m/sec. what is the kinetic energy?
- Q.2** (a) State the first law of Thermodynamics and derive the equation for it. **(07)**
(b) An electric current of 0.5 amps. From 12 volt supply is passed for 5 minutes to a Resistor in thermal contact with saturated water at 1 atmosphere. As a result, 0.798 gm of water is vaporized. Assuming that the water vapor behaves ideally. Calculate the molar internal energy change & enthalpy change during the process. **(07)**
- OR**
- (b) Derive the relationship between C_p & C_v for ideal gas. **(07)**
- Q.3** (a) State the phase rule & derive the equation for it. **(07)**
(b) Derive the Maxwell's equation (any three). **(07)**
- OR**
- Q.3** (a) Discuss in brief about Eutectic system. **(07)**
(b) Derive Gibbs Helmholtz equation. **(07)**
- Q.4** (a) List out the characteristics which are required during the choice of Refrigerant. **(07)**
(b) Discuss the effect of Cross-linking on Solubility. **(07)**
- OR**
- Q.4** (a) Write a note on Ceiling temperature. **(07)**
(b) Explain in detail about factors affecting Heat of Polymerisation. **(07)**
- Q.5** (a) Discuss in brief about construction & working of Junker's Calorimeter. **(07)**
(b) Discuss on Carnot's Theorem. **(07)**
- OR**
- Q.5** (a) Discuss in brief about construction & working of Bombshell Calorimeter. **(07)**
(b) Write a note on metallurgical coke. **(07)**
