

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-III • EXAMINATION – WINTER • 2014****Subject code: 2132603****Date: 30-12-2014****Subject Name: Thermodynamics of Elastomers & polymers****Time: 02.30 pm - 05.00 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)

- (i) Define the term:- (1) Flame temperature (2) Heat of vaporization
- (ii) Give difference between reversible process & irreversible process.
- (iii) Define the term heat capacity with their types.
- (iv) Give standard state conventions for solid, liquid, gas & solution.
- (v) Write any two applications of thermodynamics in Rubber Industry.
- (vi) Give comparison between extensive properties and intensive properties.
- (vii) Write the difference between petrol & diesel.

Q. 2 (a) Derive any three Maxwell's thermodynamic relations by using thermodynamic quantity. (07)**Q. 2** (b) Explain Carnot's theorem with diagram & derive expression for carnot's theorem. (07)**OR**

(b) Answer the following.

(i) The efficiency of an engine is 0.42. calculate the heat that must be withdrawn from the reservoir at higher temperature to produce 203 cal of work. (03)

(ii) The free energy change (ΔG) accompanying a given process is -85.77 KJ at 250C & -83.68 at 350C. Calculate the change in enthalpy (ΔH) for the process at 300C. (04)**Q. 3** (a) Explain the working principal, construction & calculation of bomb calorimeter with sketch. (07)

(b) What is fuel? Write down the characteristics of good fuel. (07)

OR**Q. 3** (a) Explain the working principal, construction & calculation of Junker's gas calorimeter with sketch. (07)

(b) Write down the advantages of solid fuel and gaseous fuel. (07)

Q. 4 (a) Discuss the brief about types and characteristics of chemical equilibrium. (07)

(b) Explain in detail about Ideal & Non ideal solutions. (07)

OR**Q. 4** (a) Write factors affecting on Le-chatelier Braun principle & explain in detail about influence of those factors. (07)

(b) Write a short note on thermodynamic quality of a solvent. (07)

Q. 5 (a) Short note on Heat of polymerization. (07)

(b) Define the term "phase rule" and. Explain in brief about the terms phase and (07)

component.

OR

- Q. 5** (a) Short note on ceiling temperature. (07)
- (b) List out the merits & demerits of phase rule. (07)
