

Subject Code: 3132604

Date: 30/11/2019

Subject Name: Rubber Physics & its thermodynamics

Time: 02:30 PM TO 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.

		Marks
Q.1	(a) Differentiate Extensive properties & Intensive properties.	03
	(b) A man circling the earth in a spaceship weighed 100 N at location there the local gravitational acceleration was 2.5 m/s^2 . calculate the mass of the man and his weight on the earth.	04
	(c) Derive the formula for entropy change of an ideal gas.	07
Q.2	(a) Describe the meaning of a spontaneous reaction in terms of enthalpy and entropy changes.	03
	(b) Explain the concept of Coefficient of Linear Thermal Expansion.	04
	(c) How an estimation of heat of polymerization is carried out?	07
	OR	
	(c) Short note on Thermodynamic investigation of polymer-polymer systems for three component systems.	07
Q.3	(a) Classify the polymers according to their main chain backbone. Also give their examples.	03
	(b) What are the advantages and disadvantages of solution polymerization techniques?	04
	(c) Derive the Flory-Huggins Equation with respect to Entropy of mixing and thermal solution.	07
	OR	
Q.3	(a) Classify the polymers according to their thermal behavior. Also give their examples.	03
	(b) What are the advantages and disadvantages of suspension polymerization techniques?	04
	(c) Explain in detail about enthalpy of mixing of two polymers & free energy of mixing of polymers for binary polymer-polymer systems.	07
Q.4	(a) Summarize the general rules of polymer solubility.	03
	(b) Derive the formula to calculate the surface tension with suitable experimental setup.	04
	(c) Discuss in detail about characteristic properties of Rubber.	07
	OR	
Q.4	(a) Summarize the different molecular motions observed in Rubber.	03
	(b) Derive the formula to calculate the relative viscosity with suitable experimental setup.	04
	(c) Discuss the conditions which are necessary for Polymer to behave as Rubber.	07
Q.5	(a) Distinguish the Rubbery deformation and elastic deformation.	03
	(b) Explain about the elastic collisions observed in Rubber.	04
	(c) Discuss in detail about different types of friction observed in Rubber.	07
	OR	
Q.5	(a) State the Archimedes principle of Flotation.	03
	(b) Explain in brief on Polymer solution.	04
	(c) Discuss in detail about the four elastic constants.	07
