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SHAHEED BHAGAT SINGH STATE TECHNICAL CAMPUS, FEROZEPUR

ROLL NO : | | | | | | | | | | | | | **Total number of pages:[2]**

Total number of questions: 09

B.Tech. CHEMICAL ENGG./ 5th Sem
Subject POLYMER SCIENCE&ENGG.
Code BTCH-521
Paper ID:
Batch: 2004 onwards/2011onwards/2015 onwards[Tick Relevant]

Time allowed: 3 Hrs **Max Marks:60**

Important Instructions:

- **Section A is compulsory**
- **Attempt any four questions from section B**
- **Attempt any two questions from section C**
- **Assume any missing data**
- **Additional instructions, if any**

PART A (2×10)

Q.1. Answer in brief:

(a) What is number average and weight average molecular weights concept of Polymers?
(b) What is Carother's Equation? Give its significance?
(c) What do understand by the term tensile strength? How can it be measured?
(d) Define degree of Polymerization.
(e) In which polymerization auto acceleration is more prominent? What are its adverse effects?
(f) PVC is soft and flexible, whereas Bakelite is hard and brittle .Explain.
(g) What is meant by polymer degradation? Name its various types.
(h) Enlist the various additives used in plastic processing.
(i) Define Polydispersity Index? State its relevance.
(j) Differentiate between addition and condensation polymerization. Give e.g for each.

PART B (5×4)

Q.2 Derive an expression for the rate of reaction for the chain growth polymerization.

Q.3 With neat flow diagram, describe the emulsion process of manufacturing PVC?

Q.4 What is Glass Transition Temperature of a polymer? What are the factors that influence Tg?

Q.5 What do you mean by CMC? Explain the mechanism of emulsion polymerization.

Q.6 Define degradation of a polymer and explain the mechanism of degradation by UV-light. How does it differ from Photo degradation?

PART C (10×2)

Q. 7 (a) Mention the salient features of solution polymerisation technique? How does it differ from suspension polymerisation technique?

(b) Discuss in detail the gel permeation chromatography method for determination of number average molecular wt.? Also state its limitations.

Q. 8 (a) Discuss in detail the design parameters of a batch reactor for the production of Phenol formaldehyde (Novolac). Also draw a flow sheet for the process.

(b) Define vulcanization? Explain in detail the mechanism of Sulphur Vulcanisation?

Q. 9 (a) Differentiate between Buna-N and Buna-S. Also describe the process of synthesis of Butyl rubber.

(b) With the help of flowsheet describe the industrial preparation process of Nylon6,6.