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Total number of pages:[2]

B.Tech. || CHE || 4th Sem)

Polymer science and engineering

Subject Code: BTCH-413A

Paper ID:

Time allowed: 3 Hrs

Max Marks: 60

Important Instructions:

- All questions are compulsory
- Assume any missing data
- Additional instructions, if any

PART A (10x 2marks)

Q. 1. Short-Answer Questions:

- What are polymers? What is difference between plastics and polymers?
- How structure of polymer is related to its chemical properties?
- List broad classification of polymers.
- Define power factor.
- What are copolymers, give examples also.
- How is cross-linking produced in linear polyesters?
- What is hardening system for epoxy resins?
- List processes of manufacture of cellulose acetate industrially.
- Compare the structure of PVC with polyethylene.
- Name some fillers.

PART B (5x8marks)

Q. 2. Discuss emulsion polymerization technique.

CO1

OR

Show that in free radical chain polymerization the rate of polymer formation is proportional to the first power of the monomer concentration and also to square root of initiator concentration.

CO1

Q. 3. Calculate number average molecular weight and weight average molecular weight of polymer formed from monomers as data given below: CO2

	M1	M2	M3	M4
Monomer	550	300	50	200
Numbers of molecules in polymer	50	78	109	35
Molecular weight of monomer				

OR

What is glass transition temperature and how it is related to molecular weight? CO2

Q. 4. With neat sketch of flow diagram, describe the manufacture of polypropylene. CO3

OR

With a neat sketch of the flow diagram, describe the emulsion process of PVC. What are the main advantages and disadvantages of the process? CO3

Q. 5. Write short notes on:

- a) Natural & synthetic rubber
- b) Neoprene

CO4

OR

Write short notes on:

- a) Antioxidants & other additives
- b) Vulcanization

CO4

Q. 6. What is polymer degradation? Discuss its types with examples. How it can be prevented or retarded? CO5

OR

Discuss general polymer reactor design.

CO5