

# RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, FEBRUARY 2022

THIRD YEAR [BATCH 2019-22]

INDUSTRIAL CHEMISTRY (Honours)

Date : 28/02/2022

Time : 11 am – 1 pm

Paper : XII [CC12]

Full Marks : 50

Answer **any five** questions:

[5×10]

1. What do you mean by free volume of polymer? Mention one example for each: natural polymer, thermoplastic, engineering plastic, super glue, laminating resin, biodegradable polymer. How solubility parameter is related to cohesive energy density? [1+7+2]
2. Classify polymers with respect to the mode of polymerization and give one example of each. Why LDPE is highly branched compared to LLDPE? Name a chain transfer agent and how it works? [6+2+2]
3. What do you mean by hot melt adhesive? Name one example with explanation. What is aseptic packaging? LLDPE is highly crystalline compared to LDPE---explain. Name a solvent for LLDPE and HDPE. [2+2+2+2+2]
4. Mention the reaction steps for LDPE via free radical polymerization. What is MFI? Which polymer's MFI is impossible to measure and why? What measure is taken for such polymers? [3+2+3+2]
5. Draw stress-strain diagrams for plastics, rubber, and fibers. Name one heat stabilizer used for PVC during processing. Why nylon is poor in weather resistance? What do you mean by plasticized and unplasticized PVC? [3+2+2+3]
6. Give examples: thixotropic, rheopexy, pseudoplastic, thermoplastic elastomer, dilatant. What is Weissenberg effect? Why amorphous polymers have a wide range of melting point? What is glass transition temperature? [5+1+2+2]
7. Denote the crystalline and amorphous character of each: PVC, polycarbonate, phenol-formaldehyde resin, wood, PMMA, polyamides, polyesters, poly(lactic acid). What is plasticization? [8+2]
8. What is PVC paste? Which polymer show punctures resistance? What do you mean by inter-diffusion for hot melt adhesives? Name one thermal and redox initiator system. Plot stress-strain diagram for tough plastic and rigid plastics. [2+2+2+2+2]

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