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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**

Branch: Chemical Engineering **Duration: 3 hrs.**

Course Code: 23CH6PELB3 **Max Marks: 100**

Course: Polymer Processing

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		What are thermoplastics? Give examples. List the methods used for melt processing of thermoplastics.	*CO1*	*PO 1*	**05**
	b)		Describe how crystallization, molecular orientation, and shrinkage influence the final properties of thermoplastic products.	*CO1*	*PO 1*	**09**
	c)		Differentiate between copolymerization and polymer blending.	*CO1*	*PO1*	**06**
			OR			
2	a)		Describe the stress-strain behavior of thermoplastic polymers with a schematic diagram, and explain the significance of yield point, necking, and fracture point.	*CO1*	*PO1*	**10**
	b)		Discuss any two standard tests used for evaluating the long-term behavior of polymers in engineering applications.	*CO1*	*PO1*	**10**
			UNIT - II			
3	a)		Explain the principle and working of a single-screw extruder with a neat diagram.	*CO2*	*PO2*	**06**
	b)		Explain the extrusion coating process with a neat diagram. Discuss the advantages of extrusion coating over other coating methods.	*CO2*	*PO2*	**08**
	c)		Differentiate between single-screw and twin-screw extruders.	*CO2*	*PO2*	**06**
			OR			
4	a)		Describe the functions of the feed zone, compression zone, and metering zone in an extruder.	*CO2*	*PO2*	**06**
	b)		Explain the extrusion film blowing & extrusion blow molding process with a diagram.	*CO2*	*PO2*	**10**
	c)		How does wire drawing differ from conventional extrusion?	*CO2*	*PO2*	**04**

			UNIT - III			
	5	a)	Explain the working principle of reciprocating screw injection molding.	*CO3*	*PO2*	**05**
		b)	Write short notes on: (i) Reaction injection molding, (ii) Defects in injection molding	*CO3*	*PO2*	**08**
		c)	Compare injection molding and extrusion molding in terms of process, advantages, and limitations.	*CO3*	*PO2*	**07**
			OR			
	6	a)	Discuss five major industrial applications of injection molding.	*CO3*	*PO2*	**05**
		b)	Write short notes on: (i) Sandwich molding, (ii) Injection blow molding.	*CO3*	*PO2*	**08**
		c)	Discuss the different types of gates used in injection molding and their applications.	*CO3*	*PO2*	**07**
			UNIT - IV			
	7	a)	Explain the principle and operation of compression molding with a neat diagram. Enlist its advantages and limitations.	*CO4*	*PO2*	**10**
		b)	Explain the principle and operation of transfer molding with a neat diagram. Enlist its advantages and limitations.	*CO4*	*PO2*	**10**
			OR			
	8	a)	Explain the principle and working of calendaring with a neat diagram. Enlist its advantages and limitations.	*CO4*	*PO2*	**10**
		b)	Derive an expression for the film thickness of the product and the pressure required in a typical calendaring process.	*CO4*	*PO2*	**10**
			UNIT - V			
	9	a)	Describe the step-by-step process of vacuum forming with a neat diagram.	*CO4*	*PO2*	**05**
		b)	Explain five major industrial or commercial applications of thermoforming.	*CO4*	*PO2*	**05**
		c)	Describe the principle of rotational molding. Derive the relation for estimating the time required for the molding process.	*CO4*	*PO2*	**10**
			OR			
	10	a)	Explain the principle of thermoforming and describe the general steps involved.	*CO4*	*PO2*	**08**
		b)	List three advantages and three limitations of rotational molding.	*CO4*	*PO2*	**06**
		c)	Discuss the applications of rotational molding in various industries.	*CO4*	*PO2*	**06**

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