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1504E206

Candidate's Seat No :_____

M.Sc. Sem.-4 Examination

509

Polymer Science

Time : 2-30 Hours] **April-2025** **[Max. Marks : 70**

Question-1:		
(i)	Discuss in details the nomenclature of enzymes. Which organization is responsible for establishing a standardized naming system for enzymes?	(7)
(ii)	Write short notes on substrate specificity, reaction specificity and stereo specificity of enzymes.	(7)
	OR	
(i)	Describe shape complementarity, induced fit model and electrostatic complementarity involved in enzyme specificity.	(7)
(ii)	Discuss the physical factors that affect the activity of enzymes.	(7)
Question-2:		
(i)	Briefly describe spray drying, microsphere technology and pelletization with suitable diagrams.	(7)
(ii)	Discuss masterbatch manufacturing processes involved in the production of particulate starch-based products.	(7)
	OR	
(i)	Discuss any seven physical properties of particulate starch-based products.	(7)
(ii)	Write short notes on bulk density, tapped density and moisture content with suitable equations.	(7)
Question-3:		
(i)	What are the economic incentives of recycling? How can economic incentives play a major role in encouraging recycling practices?	(7)
(ii)	Write the importance, challenges and processing methods of including moisture scavenger in PE/starch films.	(7)
	OR	
(i)	Write a detailed note on pro-oxidation in PE/starch films.	(7)
(ii)	Discuss economics of in-plant recycling of PE/starch films.	(7)
Question-4:		
(i)	Elaborate on thetiered system for evaluating biodegradability.	(7)
(ii)	Discuss the testing standards involved in evaluating biodegradability of polymers.	(7)
	OR	
(i)	Describe the criteria for evaluating biodegradable polymers.	(7)
(ii)	Write the factors that affect the choice of environment for biodegradation.	(7)
Question-5: (Attempt any seven out of twelve)		
	1. Hydrogen bond is a type of covalent/non-covalent interaction. (Choose the correct one) 2. Write the generalized ester hydrolysis reaction. 3. In EC number system, the second digit represents ..... 4. Nucleating agent promotes ..... 5. Particle size can be determined by ..... technique. 6. Amylases break down starch into simpler sugars like ..... 7. The key advantage of using pro-oxidation in PE/starch films is to promote faster degradation of ..... (PE / starch). 8. Write the moisture scavenging reaction of calcium oxide. 9. Pyrolysis involves heating biodegradable plastics in the presence/absence of oxygen. (Choose the correct one) 10. ASTM D5338 measures the aerobic/anaerobic biodegradation of plastic materials in controlled composting environments. (Choose the correct one) 11. ASTM D6691 is used for polymers that may enter ..... ecosystems. 12. The duration of field degradation tests is typically ..... years.	(14)

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