MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

II SEMESTER M.TECH (INDUSTRIAL BIOTECHNOLOGY)

MAKE-UP EXAMINATION

Open Elective: Introduction to Biofuels and Biopolymers (BIO 5301)

ANSWER ALL QUESTIONS

Date: 28.06.2024 **Time: 9.30 am to 12.30 pm** **Max. Marks: 50**

Q. NO	QUESTION	Marks	CO	PO	BTL
1A	Comment on the carbon emission in the context of biofuels. Why is this important?	2	1	1	3
1B	What is the significance of acidogenesis and acetogenesis steps during the formation of biogas?	2	2	1	3
1C	Explain the life cycle assessment analysis to produce microalgal bioethanol? Comment on the land use changes involved.	6	2	4	4
2A	What are the factors that should be borne in mind if we have to develop a sustainable biofuel?	3	1	4	4
2B	A dairy-processing industry can use the waste and by-products produced to produce a biofuel. Which biofuel can be produced? Justify your choice.	3	2	4	4
2C	How do you decide the potential of seeds for biofuel production? Explain with a suitable example.	4	2	1	3
3A	In the Indian context, name two agricultural crops which can be used as a feedstock for biofuel production. What type of biofuels may be produced from them?	2	1	4	3
3B	Is it possible to produce biofuels from microbial biomass? Justify your answer with an example.	3	1	4	3

3C	How can we synthesize biopolymers with pre-decided physico-chemical properties? Present your answer with the possible methodology for any such biopolymer with specific properties.	**5**	**4**	**4**	**4**
4A	Which form of degradation – aerobic or anaerobic – would you recommend for the removal of polylactic acid?	**2**	**4**	**1**	**2**
4B	Name the microbial species largely used for the fermentation phase in the production of bioethanol.	**2**	**3**	**1**	**2**
4C	Illustrate the process to produce bioethanol by fermentation process of any agricultural feedstock. Give the flowsheet outlining these steps.	**6**	**2**	**4**	**3**
5A	If I produce a novel material which I claim to be biodegradable, what are the necessary parameters, that must be satisfied?	**3**	**4**	**4**	**2**
5B	A hydrophobic polymer needs to be synthesized using hemicelluloses. How can this be achieved?	**3**	**3**	**4**	**4**
5C	What are rosins? How are they produced and where are they used?	**4**	**3**	**4**	**3**
	CO: Course Outcome; BLOOM TAXONOMY LEVEL: 1-Remember, 2-Understand, 3-Apply, 4-Analyze, 5-Evaluate, 6-Create				