MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL (A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH. / II SEMESTER M.TECH. END SEMESTER EXAMINATIONS APRIL / MAY 2019 SUBJECT: Introduction to Biofuels and Biopolymers [BIO 5263] Date of Exam: 06/05/2019 Time of Exam: 2.00 PM – 5.00 PM Max. Marks: 50

Instructions to Candidates:

✤ Answer ALL the questions & missing data may be suitable assumed.

1 A .	What does the cetane number of a fuel signify, in general? Compare this parameter for any petroleum-based biofuel and biodiesel.	2
1B.	What are mechanisms of action involved in the acidogenesis and acetogenesis steps, during the formation of biogas?	4
1C.	What are tannins? Classify them based on their structure. State any two examples of tannins that can be used to produce thermosetting biopolymers.	4
2A.	What do you mean by a sustainable energy resource? Enlist any five viable solutions for increasing the use of sustainable energy resources.	3
2B.	With a flowchart, explain the major steps involved in the production of biodiesel from animal-based fats.	7
3A.	Name any two oil seeds, with a short note on their application as a potential feedstock for the production of biofuel.	4
3B.	Briefly describe the process for the production of bioethanol by fermentation process of starch feedstock. Present the general flowsheet outlining these steps.	6
4A.	How does the incorporation of plasticizers and lubricants in biopolymers affect their properties and applications?	4
4B.	What do you mean by biomass energy? How is liquid and gaseous biofuel produced from biomass? State two advantages and two disadvantages of this form of energy.	6
5A.	If I produce a novel material which I claim to be biodegradable, what are the necessary parameters, that must be satisfied?	2
5B.	Perform the life cycle assessment analysis for the production of microalgal biodiesel? Focus on all the land use changes involved in the entire process.	8