

Instructions: All questions in Section I carry equal marks  
Attempt any THREE questions in Section I  
Question IX in Section II is compulsory

## Section I (12 marks)

Q I	(a) What is bioethanol and list methods of its production.	7
	(b) Write a detailed note on properties of Biodiesel and its production.	7
Q II	(a) Give an overview of first generation of bio fuels.	7
	(b) Write the steps involved in Biorefinery.	7
Q III	(a) What is Single Cell oil. Write a note on its production.	7
	(b) Give details of Butter / Mushroom cultivation.	7
Q IV	(a) Write a note on Carotenoid pigments.	7
	(b) Write a short note use of algal biomass with advantages.	7
Q V	(a) Write a note on types of waste water with its properties.	7
	(b) Give the biological methods of liquid waste treatment.	7
Q VI	(a) Enumerate the salient features of Industrial Waste Water.	7
	(b) Explain the features Solid waste disposal.	7
Q VII	(a) What are indicators of marine pollution. Enumerate factors responsible for marine pollution	7
	(b) Write a note on methods used for cultivation of marine bacteria and fungi.	7
Q VIII	(a) Discuss applications of marine bacteria.	7
	(b) Write a note on Marine Extremophiles	7

## Section II (8 marks)

Q IX	Short Questions (One mark each)	
	1. What are Carbon Credit Points	1
	2. Two disadvantages of biofuels	1
	3. What is non contact bioleaching mechanism	1
	4. What is e-waste	1
	5. Hardness of Water	1
	6. COD and BOD	1
	7. Name one commercially available enzyme from marine microbes.	1
	8. Name media with composition used for cultivating marine microbes	1