- - Exam. Code: 1 / 5 / 3

B.A./B.Sc. (General) 6th Semester (2055)

BIOTECHNOLOGY (Elective)

Paper: Environmental and Fermentation Biotechnology BIOT-Elect-Sem.-VI-T

Time Allowed: Three Hours] [Maximum Marks: 75

Note: — Attempt FIVE questions in total. Attempt TWO questions each from Sections-A and B. Section C is compulsory.

SECTION-A

- 1. (a) Discuss the environmental impacts of conventional and modern fuels.
 - (b) Explain activated sludge process for waste treatment.

8,7

- 2. (a) Explain the role of methanogenic bacteria in biogas production.
 - (b) What are the future hopes from photosynthetic pigments in energy conversion?
- 3. Describe the role of Bacillus thuringiensis toxin as a natural pesticide. How does it contribute to sustainable agriculture?
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4. What is the significance of biofertilizers? Explain how nitrogen-fixing microorganisms enrich the soil.

SECTION-B

- 5. (a) Describe the major types of industrial fermentations.

 Discuss the significance of substrate selection in fermentation media.
 - (b) Differentiate primary and secondary metabolites. 10,5
- 6. (a) Explain the process of inoculum development for industrial fermentation.
 - (b) Why is strain improvement important? Explain one method in detail.
 - (c) Explain principle of moist heat sterilization. 5,5,5
- (a) Elaborate on downstream processing of industrial fermentation with reference to chromatographic methods.
 - (b) Explain two phase aqueous extraction process. 8,7
- (a) Describe the concept of cell and enzyme immobilization.
 Discuss its advantages in industrial processes.
 - (b) Write short note on hygiene and safety in fermentation laboratory. 9,6

SECTION—C

- 9. (a) Define renewable and non-renewable resources.
 - (b) What is gasohol?
 - (c) List two applications of solar energy in microbial biotechnology.
 - (d) How do microorganisms help in the degradation of toxic chemicals?
 - (e) What is submerged fermentation?
 - (f) Mention two techniques used for microbial cell disruption.
 - (g) Define genetic manipulation in the context of strain improvement.
 - (h) What are antifoams and why are they used in fermenters?
 - (i) Differentiate between upstream and downstream processing.
 - (j) What is the ultrafiltration? 1.5×10