C 3079

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Sixth Semester

Biotechnology

BT 1001 — ENVIRONMENTAL BIOTECHNOLOGY

(Regulation 2004)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are autotrophs and chemolithotrophs?

2. Explain nutrition with an example

3. Name some products obtained from secondary metabolism.

4. What is co-metabolism?

5. State the 'Precautionary' and 'Polluter pays' principle.

6. Write a brief note on oxidation pond.

7. What are the limitations in BOD analysis?

8. How does C/N ratio of the medium influence the microbial product formations?

9. Explain the problems encountered when ABS compounds were used in the detergents.

10. What is DNA cloning?

PART B — (5 × 16 = 80 marks)

11 (a) (i) Discuss the role of microorganisms in the cycling of elements and matter in the environment. (10)

(ii) Give an account on the different environmental factors that affect the growth of microorganisms. (6)

Or

(b) (i) Discuss the different types of symbiotic associations between microbes and other micro organisms. (10)

(ii) What is growth? Describe the sequential phases of batch culture of microorganisms. (6)

12. (a) Discuss the impact of environmental pollutants caused by petroleum hydrocarbons and suggest the microbial methods for detoxification of petroleum hydrocarbons. (16)

Or

(b) (i) What are xenobiotic compounds? List the various xenobiotic compounds and their source and effect on the environment. (8)

(ii) Write short notes on the biodegradation of pesticides and surfactants. (8)

13. (a) (i) Describe in detail on the conventional activated sludge process . (8)

(ii) Define and explain the following terms :

(1) Mixed Liquor suspended solids.

(2) Food to microorganism ratio.

(3) Hydraulic retention time.

(4) Sludge age. (8)

Or

(b) (i) Discuss in detail on the various biofilm reactors used for waste water management. (10)

(ii) Write briefly on anaerobic digestors. (6)

14. (a) Discuss the major types of pollution caused by dye and pharmaceutical industries. Suggest suitable methods for the treatment of industrial wastes from these industries. (16)

Or

(b) (i) What is meant by composting? Discuss the various factors which affects the composting. (8)

(ii) Compare composting with land filing. (4)

(iii) Write briefly on incineration. (4)

15. (a) Explain briefly the concept of recombinant DNA technology and discuss how this can be exploited in environmental biotechnology applications. (16)

Or

(b) Discuss the importance and the role of genetically engineered organisms in industries and comment on the safety aspects of it. (16)
