A 305

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2005.

Fifth Semester

Industrial Biotechnology

IB 040 — ENVIRONMENTAL BIOTECHNOLOGY

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What is meant by benevolent interaction?

2. Mention any four soil bacteria that can degrade cellulose.

3. What is meant by ring fission products?

4. List out organisms that degrade *p*–nitrophenol and aniline.

5. What are the parameters that are analyzed under physical and chemical characteristics?

6. Mention the important steps involved in anaerobic digestion.

7. Define composting.

8. Define TOC, Alkalinity, Turbidity and TKN.

9. What is meant by bioremediation?

10. What are extracellular and intracellular enzymes and give one example?

PART B — (5 × 16 = 80 marks)

11. Using the following primary settling tank data, determine the daily sludge production

Operation data :

Flow rate	=	0.15 m^3/s	Volatile solids	=	60%
Influent SS	=	280 mg/L	Specific gravity of volatile solids	=	0.99
Removal efficiency	=	58%	Fixed solids	=	40%
Sludge concentration	=	5%	Specific gravity of fixed solids	=	2.65.

12. (a) (i) How are soil bacteria isolated?

(ii) Explain various microbial interactions that takes place in degradation of wastes.

(iii) What are the basic requirements for the growth of a micro organism?

Or

(b) (i) What is mineralization?

(ii) What are the examples for recalcitrant?

(iii) Describe the degradation process of poly chlorinated triphenol.

13. (a) (i) Why aerobic process produce more sludge?

(ii) What are the merits and demerits of anaerobic process?

(iii) Explain with a neat diagram the working principle of activated sludge process.

Or

(b) (i) What is meant by biomethanation?

(ii) Explain the biological denitrification process.

(iii) What is sludge age?

14. (a) (i) Explain the unit processes involved in the treatment of dairy industry wastes.

(ii) Discuss the physical and chemical characteristics of pulp wastewater.

(iii) Briefly discuss the process of sludge dewatering.

Or

(b) (i) Explain the tonic contaminants present of dye waste water and classify them.

(ii) Discuss the anaerobic waste water treatment of dye wastes.

(iii) What are the methods used for detonifying pharmaceutical wastes.

15. (a) (i) What are the steps involved in the design of activated sludge process?

(ii) Discuss briefly about the biological characteristics of waste water.

Or

(b) Write short notes on :

(i) Solid waste management

(ii) Unit operations in waste water treatment

(iii) Latest developments in environmental biotechnology.
