

Total No. of Questions : 12]

SEAT No. :

**P1131**

**[4659]-356**

[Total No. of Pages : 2

**B.E.(Biotechnology)**

**ENVIRONMENTAL BIOTECHNOLOGY (415461)**

**(2008 Pattern)(Elective-I) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the Candidate:*

- 1) *Answers 3 questions from each section.*
- 2) *Answer to the two sections should be written in separate answer-books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Neat diagrams must be drawn wherever necessary.*

**SECTION-I**

**Q1)** Describe in detail the different methods of waste water characterization. Explain importance of characterization in treatment of waste water. **[18]**

OR

**Q2)** Answer the following :(9 marks each) **[18]**

- a) Explain the physical and chemical processes for treatment of waste water.
- b) Deduce the equation for first stage BOD.

**Q3)** Discuss the following: (8 marks each) **[16]**

- a) Low cost waste water treatment methods.
- b) Photocatalytic reactor and its disadvantages.

OR

**Q4)** With the help of neat labeled diagram explain activated sludge system and biological film system in details. **[16]**

**Q5)** Describe the various pollutants in waste water. Discuss in detail the following methods of industrial waste water treatment: **[16]**

- a) Neutralization
- b) Equalization and proportioning

OR

**P.T.O.**

**Q6)** Explain manufacturing process, sources of waste and its treatment methods for the following industries: [16]

- a) Distillery industry
- b) Dairy industry

**SECTION-II**

**Q7)** Explain the following types of particulate collectors used in industry: [18]

- a) Electrostatic precipitators
- b) Fabric filters
- c) Venture scrubbers

OR

**Q8)** Answer the following: (9 marks each) [18]

- a) Different scales for measurement of air pollution.
- b) Ambient and Stack air sampling.

**Q9)** Explain in detail the different methods of solid waste disposals. Add a note on its merits and demerits. [16]

OR

**Q10)** Discuss different types of biomedical waste and recommend their treatment options. Add a note on waste minimization. [16]

**Q11)** Describe the following: (8 marks each) [16]

- a) Liquid bioremediation.
- b) Biodegradation of herbicides and pesticides.

OR

**Q12)** Write short notes on (4 marks each) [16]

- a) Recycling of wastes.
- b) Vermicomposting
- c) Insitu bioremediation
- d) Bioventing and biosparging

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