Code No: R05312303 **Set No. 1**

III B.Tech I Semester Regular Examinations, November 2008
ENVIRONMENTAL BIOTECHNOLOGY
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the flow and mixing patterns of various types of bioreactors. [16]
2. What is anaerobic digestion? How anaerobic digestion principle will be applied to waste management? [16]
3. Discuss some novel techniques for treatment of contaminated soils. [16]
4. Write short notes on the following:
   (a) Biosorption
   (b) Extra cellular precipitation
   (c) Biofilters
   (d) Bioscrubbers. [16]
5. Discuss the role of microbes in detoxifying the toxic metals present in the effluents. [16]
6. Explain in detail how microbes are useful in enhancing the oil recovery from oil wells? [16]
7. "hazardous waste treatment in costly and slow process by biological Agents". Explain this statement. [16]
8. Write notes on the following:
   (a) Role of methanogens in xenobiotic degradation
   (b) Microbial synergism. [8+8]

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Code No: R05312303 **Set No. 2**

III B.Tech I Semester Regular Examinations, November 2008
ENVIRONMENTAL BIOTECHNOLOGY
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Explain the following principles of biological treatment of wastewater.
   (a) Microbial growth rates
   (b) Microbial kinetics. [8+8]
2. Define anaerobic digestion and classify anaerobic digestion systems. [16]
3. What are the major waste types remediated by bioremediation and explain the requirement for bioremediation? [16]
4. What is liquid phase bioremediation? Discuss the bioreactor design criteria for degradation of hazardous compounds. [16]
5. What are the advantages and disadvantages of metal biotechnology methods and how do they differ from chemical methods? [16]
6. Write notes on the following:
   (a) Algal hydrocarbons
   (b) Hydrogen-fuel. [8+8]
7. What do you know about biostimulation and bioaugmentation? Explain how these methods are useful in the treatment of hazardous waste. [16]
8. A major source of cyanide in waste is the electroplating industry. How this cyanide waste is treated by microbes? [16]

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Code No: R05312303 **Set No. 3**

III B.Tech I Semester Regular Examinations, November 2008
ENVIRONMENTAL BIOTECHNOLOGY
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Discuss the following for various biological treatment methods of waste water.
   (a) Oxygen requirements
   (b) Nutrient requirement. [8+8]
2. Write short notes on the following:
   (a) Retention period
   (b) Agitation
   (c) Loading rate
   (d) Wetness. [16]
3. Write about the following:
   (a) Basic environmental parameters that influence bioremediation
   (b) Initial site assessment for soil bioremediation. [8+8]
4. Describe the typical sequencing batch reactor operating modes and applications in liquid phase bioremediation. [16]
5. Name a few microbial strains used in metal extraction? Explain their mode of action. [16]
6. Explain various methods of hydrogen production of microorganisms. [16]
7. Explain how industrial effluents are treated by various biological methods? [16]
8. 'Biotechnology plays a major role in the treatment of hazardous waste'.justify this statement. [16]

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Code No: R05312303 **Set No. 4**

III B.Tech I Semester Regular Examinations, November 2008
ENVIRONMENTAL BIOTECHNOLOGY
(Bio-Technology)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

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1. Write notes on following:
   (a) Cell residence time
   (b) Nutrient requirement in biological treatment. [8+8]
2. What is contact digester? Discuss the principle and design of contact digester for wastewater treatment. [16]
3. What is bioremediation and discuss the major considerations for managing a bioremediation project? [8+8]
4. Discuss the sequencing batch reactor process principles and applications in liquid phase bioremediation. [16]
5. Write short notes on the following:
   (a) Biosorption
   (b) Direct leaching
   (c) Indirect leaching. [5+5+6]
6. Write notes on the following:
   (a) Ethanol fermentation
   (b) Production of biogas. [8+8]
7. Discuss in detail biological detoxification giving various examples. [16]
8. Explain the necessity of treating hazardous waste? What are the advantages of using microbes for the bio treatment? [16]

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