

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 154801

Roll No.

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B.Tech.

(SEM. VIII) THEORY EXAMINATION 2013-14

ENVIRONMENTAL BIOTECHNOLOGY

Time : 3 Hours

Total Marks : 100

Note :- Attempt all questions.

1. Attempt any two parts of the following : (10×2=20)
 - (a) What are air pollutants ? How does global warming affect the world climate and food production ?
 - (b) What are the primary and secondary waste water treatments ? Give a flow-diagram of municipal waste water treatment process.
 - (c) Define the types of waste and their characterizing parameters.
2. Attempt any two parts of the following : (10×2=20)
 - (a) What are the characteristics of biosolid ? Define the standards for agriculture use of biosolids in India.
 - (b) What are the compositions of sludge ? Describe the aerobic sludge digestion along with advantages and disadvantages.
 - (c) What are biofuels ? How do you produce methane from biological waste treatment ? Explain in detail.

3. Attempt any two parts of the following : (10×2=20)
- (a) Define the F/M ratio. Describe the process of activated sludge system with flow diagram.
 - (b) What are the effluent standards for waste water treatment ? Briefly describe the primary, secondary and tertiary treatment system.
 - (c) What is suspended growth process ? Explain the design and operation of anaerobic sequencing batch reactor.
4. Attempt any two parts of the following : (10×2=20)
- (a) What is composting ? Write a note on solid waste management.
 - (b) Comment on economical and social aspects of waste treatment.
 - (c) Define the sludge retention time. Develop the kinetic model for biological waste treatment.
5. Write short notes on any two of the following : (10×2=20)
- (a) Microbial bioremediation of heavy metals.
 - (b) Bioremediation of organic contaminants.
 - (c) Role of Genetic engineering in bioremediation.