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# Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)

Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC

Coimbatore - 641 043, Tamil Nadu, India

**Bachelor's Degree Examination – November 2025**

**V Semester**

**Class : III UG**

**Major : Biochemistry and Biotechnology**

**Time: 3 Hours**

**Max. Marks: 100**

## 23BBTDE1 Environmental Biotechnology

### Course Outcomes:

CO1: Understand the basic concepts of ecosystem and resources and types of waste management.

CO2: Learn the importance of bioremediation and biodegradation.

CO3: Illustrate the role of microbes as biofertilizers.

CO4: Discuss the importance of biopesticides

CO5: Relate and demonstrate the essence of waste water management.

### Part A

10 x 1 = 10

#### Choose the correct answer

1. What type of energy is derived from heated ground water? CO1 K2
  - a. Nuclear energy
  - b. Geothermal energy
  - c. Hydroelectric energy
  - d. Solar energy
2. Energy resources derived from natural organic materials are called CO2 K1
  - a. geothermal
  - b. fossil fuels
  - c. biomass
  - d. oil traps
3. Cellulose is an example of \_\_\_\_\_ biomass. CO2 K1
  - a. Plant
  - b. Animal
  - c. Microbial
  - d. Fungal
4. Which one of the following is an example of starch crops biomass feed stocks? CO2 K2
  - a. Sugar cane
  - b. Wheat straw
  - c. Corn stover
  - d. Orchard prunings
5. A non-directed physio-chemical interaction between heavy metal ions and microbial surface is called CO3 K2
  - a. Biotransformation
  - b. Bioconversion
  - c. Biosorption
  - d. Biomining
6. Which of the following microbe leach metals out of rock ores and can accumulate silver? CO3 K1
  - a. *Pseudomonas aeruginosa*
  - b. *Thiobacillus*
  - c. *Pseudomonas putida*
  - d. *Zoogloearmiger*
7. Xenobiotics are CO3 K1
  - a. Any chemicals that contain carbon
  - b. Products used for the biological control of pests
  - c. Special soil amendments favored in organic farming
  - d. Synthetic organic compounds not found in nature
8. The conversion of nitrogen to ammonia is called as CO4 K1
  - a. Nitrogen assimilation
  - b. Nitrogen fixation
  - c. Nitrification
  - d. Denitrification
9. In the activated sludge process CO5 K2
  - a. Aeration is continued till stability.
  - b. Aeration is done with an admixture of previously aerated sludge
  - c. Sludge is activated by constant stirring
  - d. Water is removed by centrifugal action

**Part B**

**5 x 6 = 30**

**Answer ALL questions**

**Each answer should not exceed 400 words or two pages**

- 11.a. Give an account of energy conservation methods. CO1 K2  
(or)  
11.b. Explain about conventional fuels. CO1 K2
- 12.a. Write a note on bioremediation using genetically engineered microbes. CO2 K3  
(or)  
12.b. What is Phytoremediation? Explain. CO2 K2
- 13.a. Give a short account on Algal Biofertilizers. CO3 K2  
(or)  
13.b. Write a short note on the mechanism of Nitrogen fixation. CO3 K2
- 14.a. Explain the role of microbes in the degradation of pesticides. CO4 K2  
(or)  
14.b. How *Bacillus thuringiensis* act as a biopesticide? Explain. CO4 K2
- 15.a. Explain the biological methods involved in waste water treatment. CO5 K3  
(or)  
15.b. Compare and contrast BOD and COD. CO5 K2

**Part C**

**5 x 12 = 60**

**Answer ALL questions**

**Each answer should not exceed 800 words or four pages**

- 16.a. Distinguish in detail about renewable and non-renewable energy resources with examples. CO1 K2  
(or)  
16.b. Explain about solar energy generation, importance and its applications. CO1 K3
- 17.a. Elaborate the various processes involved in the degradation of xenobiotics. CO2 K2  
(or)  
17.b. Illustrate the types of bioremediation. CO2 K2
- 18.a. Discuss the process involved in the biodegradation of plastics. CO3 K2  
(or)  
18.b. Give a detailed account on Biofertilizers. CO3 K1
- 19.a. Write a note on the enrichment of ores by microorganisms. CO4 K2  
(or)  
19.b. Explain the environmental significance of genetically modified microbes, plants and animals. CO4 K2
- 20.a. Describe the physical, chemical and biological methods of wastewater treatment. CO5 K2  
(or)  
20 b. Elaborate the process involved in industrial effluent treatment. CO5 K2

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