


**VIT**

Vellore Institute of Technology

**Final Assessment Test – November 2025**

Course: TBIT307L - Environmental Biotechnology

Class NBR(s): 6844

Time: Three Hours

Slot: B1+TB1

Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

| COs | CO Statements                                                                          |
|-----|----------------------------------------------------------------------------------------|
| CO1 | Explain different types of pollution and role of biogeochemical cycles in environment. |
| CO2 | Define types of bioremediation to remediate environment.                               |
| CO3 | Outline technologies of Phyto and rhizoremediation for removal of pollutants.          |
| CO4 | Design methods for microbial fuel cell and GMOs in bioremediation.                     |
| CO5 | Summarize role of extremophiles in bioremediation.                                     |

**BL – Blooms Taxonomy Level (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)**

**Answer ALL Questions**

**(10 X 10 = 100 Marks)**

- |      |                                                                                                                                     |     |     |
|------|-------------------------------------------------------------------------------------------------------------------------------------|-----|-----|
| 1.   | How does carbon cycle disruption influence other biogeochemical cycles?                                                             | CO1 | BL2 |
| 2.   | Can qualitative detection help in identifying the source and pathway of contamination in a polluted ecosystem? Justify your answer. | CO1 | BL3 |
| 3.a) | Explain the interaction between environmental factors and pollutant availability in influencing bioaccumulation.                    | CO2 | BL2 |

**OR**

- |      |                                                                                                                                      |     |     |
|------|--------------------------------------------------------------------------------------------------------------------------------------|-----|-----|
| 3.b) | Explain the significance of abiotic versus biotic factors in determining the persistence of xenobiotic compounds in the environment. | CO2 | BL2 |
| 4.a) | Analyse how soil texture, pH, and moisture content influence the efficiency of contaminant degradation in land farming systems.      | CO2 | BL4 |

**OR**

- |      |                                                                                                                                        |     |     |
|------|----------------------------------------------------------------------------------------------------------------------------------------|-----|-----|
| 4.b) | Analyse how biofilm formation in a trickling filter in the removal of organic pollutants. Mention the factors affecting this process.  | CO2 | BL4 |
| 5.   | Discuss the role of root exudates in the degradation of xenobiotics.                                                                   | CO3 | BL2 |
| 6.   | How do PGPR enhance plant tolerance to abiotic stresses such as salinity, drought, and heavy metals?                                   | CO3 | BL2 |
| 7.   | What types of pollutants can be treated using packed-bed bioreactors? What is the advantage of using PBBRs over conventional reactors? | CO4 | BL1 |
| 8.   | Compare the efficiency of GMOs versus naturally occurring organisms in the degradation of a specific pollutant.                        | CO4 | BL4 |

9. Explain the concept of metagenomics and discuss its applications in environmental bioremediation.

CO5 BL3

10. List and explain the potential of hydrothermal vent microbes in bioremediation of pollutants.

CO5 BL2

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