

GUJARAT TECHNOLOGICAL UNIVERSITY

M.SC. INDUSTRIAL BIOTECHNOLOGY(IB) - SEMESTER - 3 EXAMINATION - WINTER - 2024

Subject Code: 1330102

Date: 20 Nov 2024

Subject Name: Environmental Biotechnology

Time: 10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Draw neat and clean diagrams as required.

Q.1 Write a note on following

**(Marks-
10X2=20)**

1. Symbiotic nitrogen-fixing bacteria
2. Biodiversity conservation
3. Decomposers in an ecosystem
4. Bioprospection
5. Acidophilic microbes
6. Environmental Metagenomics
7. Ocean acidification
8. Mycorrhizal associations with plants
9. Climate change
10. Facultative ponds

Q.2 Answer the following (Any 2 out of 3)

**(Marks-
2X10=20)**

1. How can genomic and metagenomic approaches be used to identify and characterize novel microbes for environmental applications.
2. Describe pollution from various sources, such as industrial emissions, waste disposal, and agricultural runoff and methods to reduce them?
3. Compare and contrast morphological and molecular methods for studying microbial diversity from environments.

Q.3 Answer the following (Any 6 out of 8)

**(Marks-
6X5=30)**

1. What is the role of producers, consumers, and decomposers in energy transfer?
2. Compare and contrast in situ and ex situ bioremediation techniques.
3. Explain the process of bioleaching and its role in metal extraction.
4. What are the primary mechanisms by which PGPR promote plant growth?
5. How can we mitigate the effects of climate change, and what are the potential benefits of sustainable practices?
6. What are the potential applications of phosphate solubilizing microbes in sustainable agriculture and environmental remediation?
7. What are the challenges associated with the application of mycorrhizal inoculum in the field?
8. What are the different types of lagoons used for wastewater treatment?
