

GUJARAT TECHNOLOGICAL UNIVERSITY**M.SC. INDUSTRIAL BIOTECHNOLOGY(IB) - SEMESTER - 1 EXAMINATION - WINTER - 2023****Subject Code:1310102****Date: 19 Dec 2023****Subject Name:Industrial Microbiology****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. Cyanobacteria
2. Batch fermentation
3. Roll-tube technique
4. The small-scale bioreactors
5. Solid state fermentation
6. The concentration of products is low in solid state fermentation
 - a) True
 - b) False
7. Airlift bioreactor
8. Halophile
9. Extremophiles
10. Immobilized enzyme

Q.2 Answer the following (Any 2 out of 3)**(Marks-
2X10=20)**

1. Write about any two immobilization techniques with a case study
2. Give detail note on culture strategies of extremophiles through batch and continuous process
3. Explain the sequential nature and experimental design for improvement of fermentation

Q.3 Answer the following (Any 6 out of 8)**(Marks-
6X5=30)**

1. Write disadvantages of solid state fermentation
2. Brief GMD's for culture and assays
3. Describe non-recombinant strain improvement methods
4. Note on semi-automating screening tests of microbes
5. Explain small scale process control of fermentation
6. Comment on culture preservation and inoculum development
7. Difference between open and closed GMD's
8. Emphasis actinomycetes in industrial microbiology
