Unique Paper Code (UPC)	:	32531501
Name of the Paper	:	Industrial Microbiology
Name of the Course	:	B.Sc. (Hons.) Microbiology
Semester	:	5
Duration	:	4 hours including time taken for downloading question paper and uploading answer sheets
Maximum marks	:	75

On first page, please write the following details:

1. Date and time of examination (DD/MM/YYYY, Hours:Min)
2. Examination Roll Number
3. Name of the Program, i.e. B.Sc. (H) Microbiology
4. Semester
5. Unique Paper Code (UPC)
6. Title of the Paper
7. Name of the College
8. Email ID of the student
9. Mobile Number of the student

SET 1

Attempt any ***four*** questions. **All** questions carry equal marks. Please answer on A4 size sheets and mark the page number at the top of each page.

Q1. Do you agree with the statement "Continuously stirred tank reactors and Air lift fermenters are the most commonly used fermenters at the industrial scale but they are different in their designs " . Give a comparative account for these reactors in detail along with their well labelled diagrams. How is the problem of foaming is controlled during fermentation ?

5+10+3.75 =18.75

Q2. Microbial enzymes are expensive to produce industrially, so methods have been developed to reuse them. Discuss such methods in detail and mention their advantages. Provide any two examples of large-scale applications of such enzymes. 12+6.75=18.75

Q3. What are the important components of an industrial fermentation medium? Differentiate between crude and synthetic fermentation media used in industry? Describe any two crude

carbon and nitrogen sources each in detail. 1.75 +5+ 12= 18.75

Q4. Define secondary metabolites, give an example of any one discovered by serendipity. Explain in detail about its structure, producer organism, industrial production, recovery and commercial use. 3+15.75=18.75

Q5. Discuss different strain improvement methods of industrially important microorganisms. Elaborate upon the differences between SSF and SmF used for the production of industrially important metabolites. 10+8.75=18.75

Q6. Give a detailed scheme of upstream and downstream processes used in the microbial production of an amino acid and a vitamin. Also write their uses. 8+8+2.75 =18.75