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(20425) Roll No. .....

B.Sc. (Micro.)-III Year

3509

B.Sc. (Microbiology)

Examination, April-2025

INDUSTRIAL MICROBIOLOGY

(B-306)

[B.Sc. (Micro.)]

Time : Three Hours] *[Maximum Marks : 50*

Note : Attempt any **five** questions. **All** questions carry equal marks.

1. Discuss the key characteristics that make a microbe industrially important. Explain how these characteristics contribute to their industrial applications. 10

2. (a) What are the different methods used to isolate and identify industrially important microbes from natural environments? Explain in brief.2×5

   (b) What are the different challenge associated with the isolation of industrially important microbes.

3. Outline the key factors that influence microbial growth in a controlled environment. How these factors can be optimized in a laboratory settings.

4. Discuss following in detail (any **two**): 2×5

   (i) Steps involved in developing a growth media

(ii) Conditions for optimal microbial growth

(iii) Scale-up of microbial fermentation

5. (a) Explain microbial growth kinetics in detail. 2×5

(b) Give a detailed note on different modes of fermentation with suitable example of industrial process.

6. Differentiate single, batch, continuous, surface, submerged and solid state fermentation along with advantages and disadvantages associated with each. 10

7. With the help of well labelled diagram explain the function of different parts of a fermenter/bioreactor. 10

8. Discuss the operation and benefits of stirred-tank, airlift and bubble column fermenters with well labelled diagrams. 10

9. Outline the industrial production process of penicillin. What are the key stages involved in microbial production of penicillin? 10

10. How does industrial amylase production is being carried out? Give a detailed note on the industrial application of amylase enzyme. 10