

This question paper contains 3 printed pages]

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S. No. of Question Paper : 5696

Unique Paper Code : 3183012005

Name of the Paper : Industrial Microbiology

Name of the Course : B.Sc. (H) Biomedical Science (NEP-UGCF-2022)

Type of the Paper : Discipline Specific Elective (DSE)

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt five questions in all.

Question No. 1 is compulsory.

Give illustrations and examples wherever required.

Subparts of the questions should be attempted together.

1. (a) Define (any four) : 4×2.5
- (i) Biological oxygen demand
 - (ii) Permanganate value
 - (iii) Total organic carbon
 - (iv) Microbial Fertilizers
 - (v) Inoculum.

P.T.O.

(b) Differentiate between (any *four*) : 2×4.

(i) Bioremediation and Biomining

(ii) Wine and Beer

(iii) Pilot plant and laboratory batch culture

(iv) Aseptic and non-aseptic fermentations

(v) Industrial microbiology and Chemical Industry

2. (i) Describe the advantages and applications of using *Pichia* in the production of recombinant proteins and bio-based products.

(ii) Define the key components of a common industrial fermenter and explain their functions during microbial fermentation.

(iii) What causes foam production in a fermenter, and how can it affect the fermentation process ? 6,6,6

3. Write short notes on (any *four*) : 4×4.5

(i) Bioprocess

(ii) Ethical issues related to GMO

(iii) Mutants and wild type strains

(iv) Yeast production

(v) Wine production.

4. (i) Discuss the key areas of industrial microbiology that are involved in the production of bio-based products.

- (ii) What factors contribute to the obsolescence of certain techniques and practices in industrial microbiology ?
- (iii) Define upstream processing (USP) and downstream processing (DSP) in industrial microbiology. How do they differ ? 6,6,6
- 5. (i) Discuss the importance of carbon, nitrogen, vitamins, and trace elements in the composition of industrial media.
- (ii) What are the potential sources of raw materials used in industrial microbiological media ? Explain briefly.
- (iii) What is saccharification, and how do microorganisms assist in the conversion of plant waste materials into fermentable sugars ? 6,6,6
- 6. (i) What are some key characteristics of *E. coli* that make it suitable for industrial microbiology and biotechnology ?
- (ii) Explain the process of isolating suitable microorganisms for industrial use from natural environments.
- (iii) Discuss the criteria for classifying microorganisms as GRAS and provide examples of GRAS microorganisms used in food and pharmaceutical industries. 6,6,6

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CORRIGENDUM

Sl. No. of Q.P	:	5690
Unique Paper Code	:	3183012005
Name of the Paper	:	Industrial Microbiology
Course	:	B.Sc. (H) Biomedical Science
Exam	:	04/06/2025 Morning
SEMESTER/YEAR	:	IV
DURATION	:	3 Hour
Maximum Marks	:	90

Announcement for candidates

Sl. No. be read as **5690** instead of 5696



Joint Registrar (Secrecy)