

This question paper contains 3 printed pages]

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S. No. of Question Paper : 13457

Unique Paper Code : 2534001203

Name of the Paper : Applications of Microbes in Biotechnology

Name of the Course : Microbiology (NEP-UGCF)

Semester : VII

Duration : 2 Hours

Maximum Marks : 60

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

Attempt any five questions.

All questions carry equal marks.

Attempt all parts of the question together.

1. (a) Define proteomics and write its applications. 4
 - (b) Name the scientist who developed golden rice. Explain how it helps in addressing nutritional deficiencies. 4
 - (c) Differentiate between natural mutants and laboratory-selected mutants. 4
- Give one example of each with its application in biotechnology.

P.T.O.

2. (a) Write one application of microbial biotechnology in : $3 \times 2 = 6$

(i) Agriculture

(ii) Healthcare

(iii) Environmental management

(b) Explain the role of microbes in bioremediation. Comment on the concentration of uranium from waste using bacteria. 6

3. (a) Define gene therapy. Explain how viruses are used as vectors for treating SCID in humans. 4

(b) Explain the production of biofuel from lignocellulosic waste. 4

(c) Expand GEMs and write its advantages and disadvantages. 4

4. Write short notes on (any three) : $3 \times 4 = 12$

(i) Bioplastics

(ii) Bt Cotton

(iii) Streptomycin

(iv) Oilzapper

5. (a) What is the process of production of vitamin B12 ? Briefly elaborate on its applications. 4
- (b) Define bioleaching. Discuss its application in mineral recovery of metals. 4
- (c) What is xenobiotics ? Explain the microbial capacity to degrade xenobiotics with suitable examples. 4
6. (a) Briefly explain fertilizers from agricultural waste. 4
- (b) Give *two* examples of methane and hydrogen gas producers. 4
- (c) Explain the production of high fructose corn syrup using immobilized microbial enzyme. 4