

**3 (Sem-6/CBCS) BOT HE 1**

**2023**

**BOTANY**

(Honours Elective)

Paper : BOT-HE-6016

**(Industrial and Environmental Microbiology)**

Full Marks : 60

Time : Three hours

***The figures in the margin indicate full marks for the questions.***

1. Answer the following : 1×7=7

- (a) Who coined the term 'antibiotic'?
- (b) What is the role of leg-haemoglobin in  $N_2$ -fixation?
- (c) Mention *any two* advantages of immobilized enzymes used in fermentation.

*Contd.*

(d) Name *one* microorganism used in commercial production of lipase.

(e) What is biosorption?

(f) What is 'Hartig net'?

(g) Name *one* air-borne bioallergen.

2. Answer the following in short :  $2 \times 4 = 8$

(a) Why is impeller or agitator called as a key component of a bioreactor?

(b) Write *one* isolation method of soil microorganisms.

(c) Define synthetic media. Write the composition of *any one* synthetic medium.

(d) How was water pollution related to 'Minamata' disease in Japan?

3. Write on *any three* of the following :  $5 \times 3 = 15$

(a) Characteristics of Microbes used in industrial microbiology

(b) Air-lift bioreactor

(c) Basic components of a fermentation medium

(d) Indicators of water pollution

(e) Screening of Microbes for casein hydrolysis

4. Answer *any three* of the following :  $10 \times 3 = 30$

(a) Define fermentation. Write briefly about solid state and liquid state fermentations and also mention their various uses in industries.

$1 + (4 + 4 + 1) = 10$

(b) What is mycorrhiza? Write about the different types of mycorrhiza. Describe the contribution of arbuscular mycorrhizal fungi in agriculture.

$2 + 4 + 4 = 10$

(c) Write about the commercial production of citric acid and its use in various industries.

$8 + 2 = 10$

(d) Write an essay on bioremediation of contaminated soil. Discuss its advantages and disadvantages.

$8 + 2 = 10$

(e) Write briefly the screening process of microbes used in industries. Why is secondary screening important?

8+2=10

(f) Describe the scope and application of Microbes in biotechnology and other branches of biology.