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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.