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.

(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 : 2×4=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 : 5×3=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 : 10×3=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.
