*(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.

**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.

(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