3 (Sem–6/CBCS) BOT HE 1

2025

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) Name the dominant bacterial group of animal/human origin present in polluted water.

   (b) What is *in-situ* bioremediation ?

   (c) What is the full form of VAM ?

   (d) What is bioterrorism ?

   (e) In which type of bioreactor, stirring of medium is done forcibly ?

   (f) _____ bran is used in Koji process of fermentation.

(g) Name the pink or red pigment-like haemoglobin found in the root nodules of leguminous plants.

2. Answer the following in short : 2×4=8

(a) What is Bioventing ?

(b) Write the composition of Potato-Dextrose-Agar Medium.

(c) What are the advantages of using immobilized enzymes ?

(d) What is downstream processing ?

3. Answer ***any three*** of the following : 5×3=15

(a) Describe briefly about the scope of industrial microbiology.

(b) Describe briefly about batch fermentation and continuous fermentation.

(c) Find out TDS with the following results
Initial weight of evaporating dish = 21.4215*g*.
Final weight of evaporating dish = 23.8512*g*.
Volume of sample taken for filtration = 250*mL*.

(d) Explain about the Coliform bacteria as indicator organism.

(e) Describe briefly about enumeration of microbes in air.

4. Answer ***any three*** of the following : 10×3=30

(a) Write an essay on the process of biological nitrogen fixation. Mention the significance of the process.

(b) For BOD test, 75*ml* of a pond water sample is used in the 300*ml* of BOD bottle without seeding with three duplications. The initial DO in three bottles read 8.86, 8.88 and 8.83*mg/L* respectively. The DO levels after 5 days at 20°C incubation are 5.49, 5.65 and 5.53*mg/L* respectively. Find the BOD for the pond water.

(c) Give an illustrated account on different methods of cell disruption.

(d) Write an essay on penicillin biosynthesis.

(e) What are the different methods of enzyme immobilization ?

(f) Write down the preparation and methodologies on alcohol (ethanol) production.
