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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 : $2 \times 4 = 8$

- (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 : $5 \times 3 = 15$

- (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 = 21.4215g.
Final weight of evaporating dish = 23.8512g.
Volume of sample taken for filtration = 250mL.
- (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 : $10 \times 3 = 30$

- (a) Write an essay on the process of biological nitrogen fixation. Mention the significance of the process.
- (b) For BOD test, 75ml of a pond water sample is used in the 300ml of BOD bottle without seeding with three duplications. The initial DO in three bottles read 8.86, 8.88 and 8.83mg/L respectively. The DO levels after 5 days at 20°C incubation are 5.49, 5.65 and 5.53mg/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.