10. Write short notes on ***any four*** of the following : 4×4=16

i) Probiotics,

ii) Bioleaching of copper,

iii) Fermented food,

iv) Vinegar production,

v) Biogas,

vi) Aquaponics,

vii) Molasses and its use

[Neatness carries 4 marks]

M.Sc. (Biotechnology) Part - II Examination, 2019

Microbial Biotechnology

Paper - IVB

Time : Four hours Full Marks : 100

Answer ***any six*** questions

1. a) Why microbial biotechnology is often more desirable than other biotechnology ?

b) What are the desirable properties of a bioreactor ?

c) Explain with examples the upstream and downstream processing. 4+4+(4+4)=16

2. a) Explain why culture preservation is important in microbial biotechnology ?

b) Compare the different methods of culture preservations.

c) Describe the role of the Curator of a microbial type culture collection center ?

d) Name one such culture collection center of India and one of abroad. 3+6+6+1=16

3. a) What are the industrial enzymes that are produced in bulk?

b) Mention two separate uses of the enzyme glucose oxidase.

c) How enzymes are immobilized ?

d) What are the advantages and disadvantages of enzyme immobilization ?

e) Why often cell immobilization is preferred to enzyme immobilization ? 4+4+4+2+2=16

4. a) Compare the properties of different reporter genes that are used as biosensors.

b) Describe in detail the bioremediation of mercury pollution. 8+8=16

5. a) Why waste water treatment should be the first priority of any nation ?

b) Describe the terms (i) BOD, (ii) primary water treatment, (iii) secondary water treatment, (iv) tertiary water treatment and (v) Quaternary water treatment ?

c) Describe how solid wastes are managed in big cities ?

2+10+4=16

6. a) Describe how different plant derived carbon sources could be funneled to fermentable sugars for ethanol production.

b) What are the desirable properties of an ethanol producer strain ? Give example.

c) How ethanol is concentrated ? What is "200 proof" ethanol ? How it is prepared ?

d) What is 'stillage' in ethanol production ?

5+(4+1)+(2+1+1)+2=16

7. a) What are the foods borne diseases of human ?

b) What are the factors involved in food preservation and food spoilage ?

c) What is SCP, give examples. What are its advantages and disadvantages ? 4+(4+4)+(1+1+1+1)=16

8. a) What are the Xenobiotic compounds ? Why are they harmful ?

b) Describe how *Pseudomonas* sp could utilize toluene as sole source of carbon.

c) What is Ames test ? (2+2)+8+4=16

9. a) Show and explain by drawing a microbial growth curve where penicillin could be produced.

b) Mention the steps involved in the strain improvement of the penicillin producing microorganism.

c) Describe the industrial production of penicillin.

d) Most of the microbes that produce antibiotics are spore formers - Explain with examples. 2+5+5+4=16