

[4]

- c) What are roles 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]

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

- i) Desirable properties of a bioreactor,
- ii) Role of *Acidithiobacillus ferrooxidans* in bioleaching of copper,
- iii) IPR, GMP, GRASS, SCP,
- iv) vinegar production,
- v) Toilet linked Biogas production,
- vi) Aquaponics,
- vii) Downstream processing of a secreted enzyme,
- viii) goal of microbial biotechnology.

[Neatness carries 4 marks]

Ex/MSBT2/4B/58/2018

M. SC. BIO-TECHNOLOGY PART II EXAMINATION, 2018

MICROBIAL BIOTECHNOLOGY

PAPER - IV B

Time : Four hours

Full Marks : 100

Answer **any six** questions :

- 1.
 - a) Why waste water treatment is necessary ?
 - b) What is meant by BOD ?
 - c) Describe the primary, secondary and tertiary water treatment.
 - d) Is there any Quaternary water treatment ? Comment.
 - e) Describe how solid wastes are managed ?

[3+2+6+1+4=16]
- 2.
 - a) Why mercury is toxic for living organisms ?
 - b) How mercury pollution could occur ?
 - c) Describe microbial remediation of mercury pollution.
 - d) Compare the properties of different reporter genes that are used as biosensors.

[2+2+6+6=16]
- 3.
 - a) Schematically describe how different biomass could be suitably converted to fermentable sugars (for ethanol production).

[Turn over

[2]

- b) What are the desirable properties of an ethanol producer strain ?
- c) Mention the microbes, other than *Saccharomyces cerevisiae*, that are used industrially for ethanol production.
- d) How ethanol is concentrated ?
- e) What is “200 proof” ethanol ?
- f) How it is prepared ?
- g) What is ‘stillage’ ? [5+4+2+1+1+1+2=16]
4. a) What are Xenobiotic compounds ?
- b) Why are they harmful ?
- c) Describe the involvement of TOL plasmid in toluene metabolism by *Pseudomonas* sp. ?
- d) Mention the roles of *Lactobacillus*, *Firmicutes* and *Bacteroides* in human health. [2+2+8+4=16]
5. a) Describe the factors involved in food preservation and food spoilage.
- b) What are fermented foods ?
- c) What are the foods borne diseases of human ? [8+4+4=16]

[3]

6. a) Penicillin is an idiotope – explain.
- b) Describe the industrial production of penicillin.
- c) Mention the steps involved in the improvement of the modern penicillin producing strain.
- d) Classic producer of antibiotics are soil microbes that go through sporulation - Explain with examples. [2+5+5+4=16]
7. a) Why microbial source are preferred for enzyme production over that of plant and animal sources ?
- b) What are the enzymes produced in bulk that are used in industries ?
- c) Mention the uses of the enzyme glucose oxidase.
- d) How enzymes are immobilized ?
- e) What are the advantages and disadvantages of enzyme immobilization ?
- f) Why often cell immobilization is preferred to enzyme immobilization ? [3+3+2+2+4+2=16]
8. a) Why Culture preservation is important in microbial biotechnology ?
- b) Describe in detail the different methods of culture preservation available.

[Turn over