

# **FD-644**

M.Sc. 3rd Semester Examination, Dec.-Jan., 2021-22

### **BIOTECHNOLOGY**

## Paper - XI

Bioprocess Engineering and Technology

Time: Three Hours] [Maximum Marks: 80

[Minimum Pass Marks: 16

**Note**: Answer **all** questions. All questions carry equal marks.

- 1. (a) Write four different types of sterilization techniques.
  - (b) What is Bioreactor?
  - (c) What is BOD?
  - (d) Give four examples of single cell protein.

#### Unit-I

**2.** Describe different types of media, their sterilization process and their importance in bioprocess engineering.

OR

**DRG\_144\_**(3)

(Turn Over)

Write about different microbial isolation, pure culture, maintenance and preservation techniques used in industrial setup.

#### **Unit-II**

**3.** Define photo-bioreactor and write different parameters and measurements to control photo-bioreactors.

#### OR

Explain details of batch, fed-batch and continuous bioreactors.

#### **Unit-III**

**4.** Write brief account of different techniques used for product recovery in industries.

#### OR

Explain various methods of cell immobilization and their importance in bioprocess engineering.

#### **Unit-IV**

**5.** Explain industrial method of ethanol production, its mechanism, purification and its importance.

#### OR

(3)

Write different methods of food preservation and give a brief idea of canning and packaging.

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