

Seat No. : \_\_\_\_\_

**N16-107**

**November-2014**

**B.Sc., Sem.-V (CBCS)**

**MI 304 : Microbiology**

**(Bioprocess Technology)**

**Time : 3 Hours]**

**[Max. Marks : 70**

- Instructions :**
- (1) All questions carry equal marks.
  - (2) Figures on right indicate marks of each question.
  - (3) Write the number of question correctly in the margin.
  - (4) Draw neat diagrams if necessary.

1. Answer the following : (Any **two**) **14**
  - (a) Describe the historical development of industrial microbiology.
  - (b) Outline and explain the component parts of a fermentation process.
  - (c) Describe biomass and transformation process as a range of fermentation products.
  - (d) Describe primary screening of organic acid producing microorganisms.
  
2. Answer the following : (Any **two**) **14**
  - (1) Describe principles of media formulation and enlist the nitrogen sources used in preparation of media.
  - (2) Explain the batch method for sterilization of fermentation media using steam.
  - (3) Explain the mechanisms by which filtration causes sterilization of fermentation media.
  - (4) Describe the general principles of seed culture development in industry.
  
3. Answer the following : (Any **two**) **14**
  - (a) Draw a labelled diagram of stirred tank reactor and explain its basic functions.
  - (b) Describe the different types of bio-catalytic reactors.
  - (c) Explain the construction and working of an air lift fermenter.
  - (d) Briefly explain the economics of a fermentation process.

4. Answer the following : (Any **two**) **14**
- (a) Give details of a continuous fermentation process.
  - (b) Explain the importance of aseptic operation in fermentation industry.
  - (c) Describe how mass transfer of oxygen occurs and give its significance.
  - (d) Describe the solid substrate fermentation process.
5. Answer the following in 1-2 lines only : **14**
- (1) Which technique is used for primary screening of antibiotic producers ?
  - (2) Name two secondary metabolites produced by fermentation process.
  - (3) Name two carbon sources used in media formulation.
  - (4) Give names of two natural antifoam agents.
  - (5) What are non-fixed pore filters ?
  - (6) Which materials are used for construction of a stirred tank bioreactor ?
  - (7) Name the design organism used for sterilization of fermentation media.
  - (8) What is the function of a baffle ?
  - (9) How is dissolved oxygen monitored during a fermentation process ?
  - (10) What is the specific use of a tower fermenter ?
  - (11) What is *del* factor ?
  - (12) Name the bacteria that produces amylase.
  - (13) Name the fungi that produces citric acid.
  - (14) How is temperature controlled in a fermenter vessel ?
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