

Seat No. : _____

ME-109

March-2018

B.Sc., Sem.-V

CC-304 : Microbiology (Bioprocess Technology) (Theory)

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) Explain the concept of fermentation and describe the development of industrial microbiology between 1940 and 1975.
 - (b) Describe component parts of a fermentation process and explain the factors affecting it.
 - (c) Describe biomass production and recombinant compounds as range of fermentation processes.
 - (d) Enlist the characteristics of an industrially ideal organism and give the significance of secondary screening procedures.

2. Answer the following (any two). 14
 - (a) Explain the principles of media formulation and describe the precursors and metabolic regulators used in media preparation.
 - (b) Explain media sterilization by heat using the continuous method.
 - (c) Describe principles of filtration and give its use in industries.
 - (d) Explain the general principles of seed culture development program in a fermentation industry.

3. Answer the following (any **two**). 14
- (a) Describe the basic functions of a bioreactor and draw a labelled diagram of stirred tank bioreactor.
 - (b) Describe the design and explain the working of an Airlift fermentor with a suitable diagram.
 - (c) Describe the packed-bed and fluidized bed biocatalyst reactors and give their use.
 - (d) Enlist the basic objectives of fermentation economics and explain how isolation of micro-organisms of potential interest influences the economics.
4. Answer the following (any **two**). 14
- (a) Explain batch and fed batch method of operating a fermentation process.
 - (b) Describe solid substrate fermentation process.
 - (c) How can asepsis be achieved and maintained during fermentation ?
 - (d) Why is aeration and agitation necessary during fermentation and explain how mass transfer of oxygen occurs.
5. Answer the following in brief : 14
- (1) Name two commercially important organic acids produced by bacteria.
 - (2) Growth exhibition is used for detection of which compound during the screening program ?
 - (3) What is molasses and give its use.
 - (4) What is corn steep liquor and give its use.
 - (5) Depth filtration is achieved by which type of filters ?
 - (6) What is the aspect ratio of a tower fermentor ?
 - (7) Name the three basic types of spargers used in a bioreactor.
 - (8) Where is the foam sensor positioned in a bioreactor ?
 - (9) Which fermentation operating system is considered as a closed system ?
 - (10) Name two products produced by continuous fermentation process.
 - (11) Name any two sources of contamination in a bioreactor.
 - (12) The aeration capacity of a bioreactor is measured by which unit ?
 - (13) Name two biological problems caused by foaming.
 - (14) How is temperature monitored and controlled during fermentation process ?