Exam. Code : 107705
Subject Code : 1903

Bachelor of Food Science & Technology (Hons.) 5th Sem.

FST-501 PRINCIPLES OF FERMENTATION TECHNOLOGY

Time Allowed—3 Hours] [Maximum Marks—50

Note :— Attempt any **five** questions. **All** questions carry equal marks.

1. (a) "Fermentation is a biochemical process among microorganisms and has been employed by the mankind over the years". Elaborate the statement. 3

   (b) The definition of fermentation has changed over the years. Justify. 2

   (c) Discuss types of fermentation processes proposed by Garden in 1959. What are the deviations of this classification ? 5

2. (a) Define growth rate and differentiate it from generation time. Find out the generation time of a yeast population that increases from 10^4 to 10^8 cells per ml. 5

   (b) Discuss development of fermentation in food industry giving suitable examples. 5

3. (a) Differentiate between Homo-and hetero-fermentation. Discuss biochemistry and production of ethanol from molasses. What will be the theoretically possible ethanol (%v/v) from molasses diluted to 15 degree Brix ? 3

(b) How is wet heat sterilization obtained practically ? Give its principle and working for sterilization of growth media. 2

(c) What are antiseptic agents ? Compare ethanol and quaternary ammonium compounds as antiseptic agents. Also enlist their application in daily life. 5

4. (a) Differentiate between the following giving suitable examples : 2.5×4=10

Aerobic and Anaerobic growth.

(b) Batch and continuous fermentation and give suitable examples.

(c) Solid state and Submerged fermentation.

(d) Primary metabolites and secondary metabolites

5. (a) Discuss the characteristics of an ideal industrial microorganism. How will you prepare starter culture for an industrial fermentation ? 6

(b) Discuss selection of suitable carbon and nitrogen sources for an industrial fermentation process. Why impure substances are used as substrates than pure chemicals for industrial fermentation media ? 4

6. (a) What are the advantages of fermenter over flask cultures ? Discuss development of fermentation over the years starting with old age earthen and wooden vessels. 5

(b) Give functions of the following in a fermenter : Baffles, Impeller, Sparger, Rotameter, DO meter and Sampling port. 3

(c) What is the utility of acid-base pump in a fermenter ? 2

7. (a) Why pressure inside a fomenter is kept higher than the surroundings ? Discuss advantages of fed batch system over a batch fermenter, 4

(b) What are the parts of a biosensor ? Describe structure and function of each of them. 6

8. (a) Discuss applications of computers in optimization as well as control of fermentation processes. 3

(b) Discuss general characteristics of mechanical, pneumatic and hydrodynamic industrial filers. 5

(c) Discuss importance of water re-usage and effluent treatment in fermentation industry. 2