

3 Hours

Total Marks: 100

1. Attempt all questions.
2. All questions carry equal marks.
3. Draw neat labeled diagrams wherever necessary.
4. Use of log tables and non-programmable calculator is allowed.

Q.1 a. Do as directed: (Any six)

06

1. Give one example of hard cheese.
2. Milk secreted in the udder is virtually sterile.(True/ False)
3. Rennet is the complex set of enzymes.(True/ False)
4. Which bacteria are also known as “The cheese destroyer”?
5. Define: Buttermilk
6. The yoghurt is made from a mixed culture of _____ and _____ bacteria.
7. Psychrotrophs are the microorganisms that have the ability to grow near freezing temperatures in the range from _____.
8. CFU<1000000 per ml is the characteristic of good quality milk. (True / False)
9. Tests for proper pasteurization are based on the activity of which enzyme?

Q.1 b. Answer the following questions: (Any Two)

14

1. What is starter culture? Discuss its role in dairy industry.
2. Explain the steps involved in Butter production.
3. Elaborate on any one direct method of enumerating bacteria in milk. State its advantages and disadvantages.

Q.2 a. Do as instructed: (Any six)

06

1. What are filter aids?
2. Cell lysis becomes an important operation if the product is _____.
3. Define lyophilization
4. Write any one application of rotary vacuum filter.
5. The charged molecules can be separated by _____.
6. How does lysozyme act on bacterial cells?
7. Name the method used to separate compounds on the basis of their relative solubilities in two different immiscible liquids?
8. _____ is used in the precipitation of dextrans.
9. Give one example of ion exchange resins.

Q.2 b. Answer the following questions: (Any Two)

14

1. List out chemical methods of cell disruption.
2. What are the different steps in downstream processing?
3. Explain in detail: Plate and frame filter press

Q.3 a. Do as directed: (Any Six)

06

1. Which technique is described by Parker for production of spores of *P. chrysogenum*?
2. Give any one type of steroidal transformation.
3. Streptomycin is antibiotic.
4. Roux bottle technique used for.....
5. Name the strain used for production of proteases,
6. Give an example of saccharide used for ethanol production.
7. The scale-up process is preferred to which condition?
 - a) The migration of a process from the lab-scale to the pilot plant-scale
 - b) The migration of a process from the bench-scale to the lab-scale
 - c) The migration of a process from the small-scale to the lab-scale
 - d) The migration of a process from the bench-scale to the small-scale
8. State true/False: In lysine production, methionine and threonine are obtained from soybean hydrolysate since it would be too expensive to use the pure amino acids
9. State True/False: The optimum pH range should be in the range of 7.0 and 8.0. High rate of streptomycin production occurs in the pH range of 7.6 to 8.0.

Q.3 b. Answer the following: (Any Two)

14

1. Elaborate on Penicillin production with respect to a) Strain used and Inoculum preparation b) Raw material for production.
2. Discuss Bacterial and fungal inoculum development using suitable examples.
3. Explain the production of protease considering strain employed and production method for two types of proteases

Q.4 a. Do as directed: (Any six)

06

1. _____ is a tool for evaluating steps in a manufacturing process and it provides a structured thought process for GMP.
 - a. GLP b. QA c. QC d. HACCP
2. _____ comprises any test on a product, the environment or the equipment that is made during the manufacturing process.
 - a. QA b. QC c. In-process control d. Manufacturing
3. Before entering into a clean/aseptic area, outer garments are removed in the _____ area.
 - a. Black b. Grey c. White d. Aseptic

4. Name any one detergent used for disinfecting skin before entering an aseptic area.
5. Name the preferred material for flooring in an aseptic area.
6. The sum total of the arrangements made to ensure that the final product is of the quality required for its intended purpose is called as _____
 a. QA b. QC c. In-process control d. HACCP
7. State True or False: The term quality is usually taken to mean fitness for purpose.
8. To achieve the necessary standards, a minimum of _____ changes of air per hour is required throughout an aseptic area.
 a. 05 b. 10 c. 15 d. 20
9. Water is kept for longer periods at a temperature above 65°C to prevent bacterial growth with consequent _____ production
 a. Pyrogen b. Antigen c. Zymogen d. Lysogen

Q.4 b. Answer the following questions: (Any Two)

14

1. Give an account of Environmental grades of an aseptic manufacturing area and the typical manufacturing operations
2. Environmental cleanliness and Quality of starting materials are important factors affecting manufacture of sterile products, Justify.
3. Describe the general requirements of clothing, changing facilities, cleaning and disinfection with respect to a sterile products manufacturing unit.

Q.5 Write Short notes on the following (Any four)

20

- a. Types of Yoghurt
- b. Pasteurization of milk
- c. Significance of drying in product recovery
- d. Scale up process
- e. Reaction and by product of ethanol production
- f. HACCP