

**B.Tech Odd Semester (CBCS) Exam.,  
December—2018**

**AGRICULTURAL ENGINEERING**

**( 7th Semester )**

Course No. : AE-EL-31

**( Milk and Milk Product Processing )**

*Full Marks : 50*

*Pass Marks : 15*

*Time : 2 hours*

- Note :*
1. Answer any **five** questions.
  2. Begin each answer in a new page.
  3. Answer parts of a question at a place.
  4. Assume reasonable data wherever required.
  5. The figures in the margin indicate full marks for the questions.

1. (a) Whole milk of 500 kg with 9% fat and 8.5% SNF are to be used for preparation of standardized milk. If the cream fat content is 35%, find out the amount of cream removal and the amount of standardized milk produced. 5
- (b) Define homogenization. Explain the purpose of homogenization. 5

2. (a) Discuss in brief various properties of milk. 5
- (b) Describe in brief the reception and storage of milk. 5
3. (a) The decimal reduction time D at 121 °C and the value of Z for a thermophilic spore in the whole milk were determined experimentally and found to be 30 s and 10.5 °C, respectively. Calculate the D value at 150 °C and required heating time at 121 °C for a 9-log cycle population reduction. 5
- (b) Describe the measurement to be taken for the safety and quality of milk and milk product. 5
4. (a) Discuss the manufacturing of milk powder with the help of a suitable figure. 5
- (b) Discuss the temperature measurement techniques commonly used in dairy plant. 5
5. (a) Describe the processing of icecream with the help of a flowchart. 5
- (b) Describe various classifications of butter. 5

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6. A food material has initial bacterial population of  $4 \times 10^5$  g/ml, it has to be processed at 79 °C for 21 sec. At 65 °C, the *D* value of the bacterial is 7 min. The *Z* value is 7 °C. Find (a) the final microbial population after processing, (b) the time required at 65 °C to achieve the same degree lethality as at the same processing condition and (c) % of inactivation. 10
7. Describe in brief the methods of pasteurization of milk with the help of figures. 10
8. Describe in brief the methods of sterilization of milk with the help of figures. 10

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