BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: IMSC **SEMESTER: VI**
BRANCH: FOOD TECH. **SESSION : SP/2019**

SUBJECT : IMF6001 DAIRY TECHNOLOGY

TIME: 1.5 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The total marks of the questions are 30.
2. Candidates may attempt for all 30 marks.
3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
4. Before attempting the question paper, be sure that you have got the correct question paper.
5. The missing data, if any, may be assumed suitably.

Q1 (a) What are the different phases of Operation Flood? [1]
(b) What are the constituents of Milk? Write a technical note on lipids in milk. State procedure for determination of Fat in Milk. [4]

Q2 (a) Name the Microbiological tests for milk. What are standards for bacteria count in raw and pasteurized milk? [2]
(b) What are the platform tests? Give procedure for determination of SNF. [3]

Q3 (a) Name the common milk adulterants and the purpose of adding them. [2]
(b) What are standardized milk, toned milk, double toned milk, skimmed milk and Full cream milk? How many parts by weight of 40% cream and 3% milk must be mixed to make milk testing 5% fat? [3]

Q4 (a) Explain the process of determination of time of Milk Sterilization/Pasteurization using D and Z values. [2]
(b) Define all the relevant parameters. In a laboratory experiment it was found that heating a suspension of spores at 120°C for 100 seconds results in a 9-log killing of the spores. To achieve the same reduction at 110° C, 27.5 seconds are needed. Calculate the decimal reduction time at the two temperatures, the z value [3]

Q5 (a) Explain the function of Flow Diversion valve and holding tube [1]
(b) Sketch flow sheet of a milk pasteurization system including Deaerator, Clarifier and Homogenizer. Mention typical temperatures in the fluid path. [4]

Q6 (a) Sketch a 2x3/3x2 Plate Heat Pasteurizer. [2]
(b) Raw whole milk at 7ºC is to be pasteurized at 72ºC in a plate heat exchanger at a rate of 6000 1/h and then cooled to 4.5ºC. The hot water is supplied at 8000 l/h at 85ºC and chilled water has a temperature of 2ºC. Each heat exchanger plate has an available area of 1.0 m^2. The overall heat transfer coefficients are calculated as 2890 W/m^2K in the heating section, 2750W/m^2K in the cooling section and 2700W/m^2K in the regeneration section. 75% of the heat exchange is required to take place in the regeneration section. Calculate the number of plates required in each section. (Assume that the density of milk is 1030 kg/m3, the density of water is 958 kg/m^3 at 85ºC and 1000 kg/m^3 at 2ºC, the specific heat of water is constant at 4.2 kJ/kg,K and the specific heat of milk is constant at 3.9 kJ kg1K.) [3]

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