B.E. FOOD TECHNOLOGY AND BIO-CHEMICAL ENGINEERING FOURTH YEAR FIRST SEMESTER SUPPLEMENTARY EXAM - 2018

FOOD PROCESS TECHNOLOGY IV   Time: 3hrs   Full Marks: 100

Use Separate Answer Script for each Part

(50 marks for each part)

PART- I

Answer question 1 and any two from the rest

1. Explain the following: 4 X 5

   a) Factors affecting composition of milk

   b) Capacity and efficiency of drum drier

   c) Over run and shrinkage of ice cream

   d) Sweetened condensed milk

2.a) What is meant by salt balance of milk and soft curd milk ?

   b) Condensed milk of 9.05 % fat and 31 % total milk solids are being prepared from 10000 kg milk containing 3.60 % fat and 12.50 % TS. Cream from the same milk contains 40% fat. How much of 40% cream must be added to provide the desired ratio of fat to SNF   3+5+7

3.a) Comment on malted milk, reconstituted milk

b) Whole milk powder contains 39.4% fat and 56.9 % SNF and water. Calculate the required amount of water for 6870 kg of reconstituted whole milk of 6 % fat   5+4+6

4. Explain the following (any three)   3x5
   a) factors affecting efficiency of drum drying of milk.

   b) effect of homogenization on milk and dairy products.

   c) effect of stabilizer and emulsifier on quality of ice cream

   d) milk protein

B B.E (FTBE) 4TH YEAR, IST SEMESTER SUPPLEMENTARY EXAM 2018

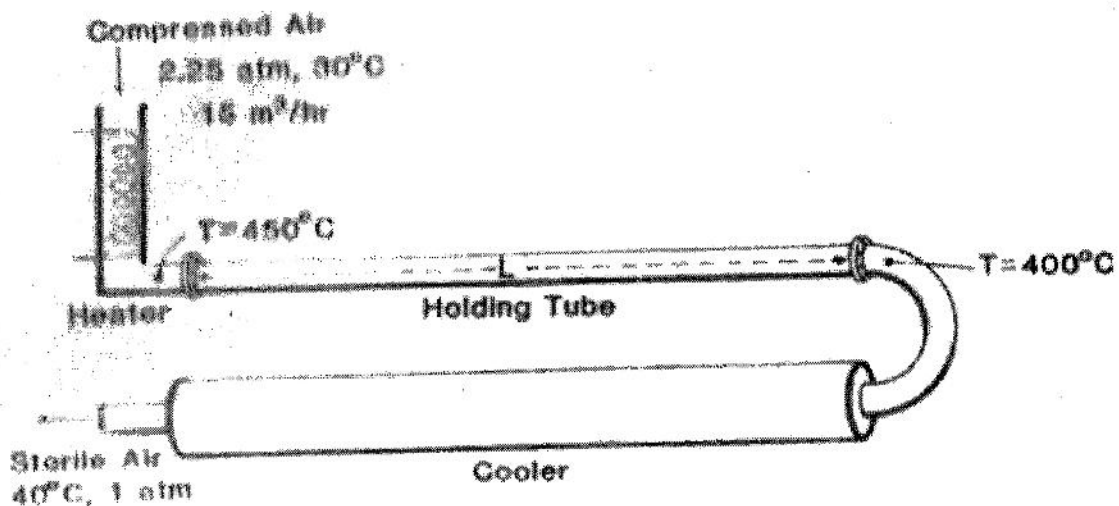**FOOD PROCESS TECHNOLOGY -IV**   **TIME: 3 H**   **FULL MARKS = 100**

PART- II (50 MARKS)

USE SEPARATE ANSWER SCRIPT FOR EACH PART

Answer **Q5** and **any Two** from the rest

Q5. a. What conditions need to be precisely controlled during roasting of coffee? Besides roasting, which are the finishing operations in coffee processing that dictate its market price?   **3 + 3**

b. Name the protein superfamilies of food allergens present commonly in foods with two examples of allergens in each category. Which regulatory body controls the levels of food allergens?   **2 + 2**

c. How does 'Black tea' differ from 'Green tea'?   **5**

d. The figure shows an air sterilization system that supplies sterile air to a process. Calculate the length of the holding tube necessary to sterilize the air. The most heat resistant organism that must be avoided requires 60 min of heating at 151 °C for sterilization and has a Z value of 70 °C. The OD of the holding tube is 1". Assume plug flow ($V_{max} = V_{avg}$).   **5**

Compressed Air
2.25 atm, 30°C
16 m³/hr
T=450°C
Heater
Holding Tube
T=400°C
Cooler
Sterile Air
40°C, 1 atm

Q6. a. Explain the concepts of lethality and integrated lethality in the holding tube of a continuous sterilization system, for fluids in laminar flow. **5**

b. Suggest composition of the blend in a soda fountain blending machine for 'cola' drink. How is this drink carbonated? What is the composition of its flavor syrup? **3 + 4 + 3**

Q7. a. How is instant coffee manufactured? What is aromatization of coffee? **5 + 2**

b. A fluid food product with a viscosity of 5 cP and density of 1000 kg/m^3 is to be pasteurized in a continuous system which heats the food to 85 °C followed by holding in a 1.5 inch sanitary pipe, from which it leaves at 82 °C. The process should give 12D reduction of *S. aureus*, which has a $D_{82 °C}$ of 0.0063 min. Using standard tables and graphs, calculate the length of the holding tube if the flow rate is 20 L/min. **8**

Q8. Write short notes on (any five): **5 × 3 = 15**
   a. Pebbly coffee beans and Slimy coffee beans
   b. CTC tea and Tea substitutes
   c. Effects of HPP on Solid foods and Liquid foods
   d. Under-fermentation and Fermentation of tea
   e. Dry bag, indirect compression' HPP and 'Wet bag, direct compression' HPP
   f. Food allergy and Food intolerance