Ref. No. Ex/FTBE/PC/B/T/223/2025

B.E (FTBE) SECOND YEAR, SECOND SEMESTER EXAMINATION 2025

PRINCIPLES OF FOOD PRESERVATION-I **TIME: 3 H** **FULL MARKS = 100**

PART- I (50 MARKS)

Q1. I. Describe the following with the aid of graphs (any 2): **2 × 5 = 10**

a. Heat removal during freezing of foods
b. Nucleation and Crystal growth
c. Thawing curves vs. Freezing curves for a fish slab of 5 mm thickness, considering all other parameters same

II. Define the following: **5 × 2 = 10**

a. T_g
b. T_E
c. Freeze burn
d. Drip loss
e. Quick freezing

OR

Q1. Differentiate between (any 5): **5 × 4 = 20**

a. Homogenous vs. Heterogeneous nucleation
b. Contraction vs. Expansion during freezing
c. Direct freezing vs. Indirect freezing
d. Quick freezing vs. Slow freezing
e. Freezing of Milk vs. Strawberry jam in bottles
f. Eutectic point of NaCl/water vs. IF_P of the mixture

Q2. Analyze the following with the aid of diagrams and graphs wherever necessary (any 5):

5 × 6 = 30

a. Sarcoplasmic vs. Myofibrillar protein damage during freezing.
b. Heat transfer, and not mass transfer limits rate of crystallization during freezing.
c. Slow freezing is not recommended for berries.
d. Addition of maltodextrin enhances storage temperature of ice cream.
e. Changes in physicochemical properties of unfrozen water during freezing.
f. Blanching is ineffective as a pretreatment method when frozen foods are to be stored at -10°C.

[Turn over

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PRINCIPLES OF FOOD PRESERVATION-I **TIME: 3 H** **FULL MARKS = 100**

PART II
(Marks 50)

Answer any five questions from the following: 5x10

1a) Define: free moisture, critical moisture and water activity content of food.

b) Explain microwave drying. 6+4

2a) Explain different steps of drying by convection.

b) Classify drying methods for fruits and vegetables 5+5

3a) Explain Spray drying technique.

b) A food product contains 20% moisture on wet basis. Calculate the moisture content on dry basis. 7+3

4.a) Mention the transport of moisture within the solid during dehydration.

b) A dry food product has been exposed to a 30% RH environment at 15^0C for 5 hours without a weight change. The moisture content has been measured and it is at 7.5% wet basis. The product is moved to 50% RH environment and a weight increase of 0.1kg/kg product occurs before equilibrium is achieved. Determine the moisture content of the product on dry basis in both environments. 4+6

5.a) What is meant by intermediate moisture fruits. State the advantages of IMF presentation.

b) A processor needs150 kg of dried tomatoes with a final moisture content of 11% wet basis. The tomatoes used for drying have a moisture content of 94% wet basis. Find the amount of starting material to give the desired amount of product. 1.5+ 2.5 + 6

6. Explain the following:

a) shrinkage of food during drying.

b) working principle of fluidized bed dryer 5+5

7. Write short notes on: (any two) . 2x5

a) effect of drying on colour of food b) case hardening of food during drying

c) tray drying of fruits.