

BV (4/CBCS) FPT/FPM VC 2

2024

**FOOD PROCESSING TECHNOLOGY/
FOOD PROCESSING AND QUALITY
MANAGEMENT**

Paper : FPT-VC-4026/FPM-VC-4026

(Basics of Food Engineering)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Answer the following as directed : 1×7=7

(a) Boiling point elevation is a
phenomenon observed in

(i) drying

(ii) freezing

(iii) evaporation

(iv) sterilization

(Choose the correct answer)

(b) Which type of freezer utilizes extremely low temperatures for rapid freezing?

(i) Air blast freezer

(ii) Plate freezer

(iii) Cryogenic freezer

(iv) Vacuum freezer

(Choose the correct answer)

(c) The _____ diagram is a graphical representation of the thermodynamic properties of steam.

(Fill in the blank)

(d) The rate of drying is highest during the _____ period.

(Fill in the blank)

(e) Which property of steam indicates the amount of heat energy it contains?

(i) Pressure

(ii) Temperature

(iii) Enthalpy

(iv) Volume

(Choose the correct answer)

(f) The efficiency of a _____ pump decreases with increasing viscosity of the pumped fluid.

(Fill in the blank)

(g) Which type of evaporator is commonly used to concentrate liquid foods?

(i) Falling-film evaporator

(ii) Drum evaporator

(iii) Multiple-effect evaporator

(iv) Plate evaporator

(Choose the correct answer)

2. Answer the following questions : 2×4=8

(a) Define the concept of equilibrium moisture content in drying.

(b) Name two factors affecting the rate of drying in food processing.

(c) Explain the significance of Z value in thermal processing.

(d) Define the terms 'bound moisture' and 'unbound moisture'.

3. Answer any *three* of the following questions :

5×3=15

- (a) Explain the process of microbial inactivation in thermal processing.
- (b) Explain the drying curve.
- (c) Compare and contrast the operation of plate freezers and cryogenic freezers.
- (d) Determine the weight reduction that would result when 100 kg tomatoes are dried from 80% moisture to 15% moisture.
- (e) Describe the factors influencing the design and selection of evaporators in food processing.

4. Answer any *three* of the following questions :

10×3=30

- (a) Discuss the role of heat exchangers in food processing and describe different types.
- (b) Explain the principles and applications of different types of pumps used in food processing plant.
- (c) Explain the concept of multiple-effect evaporators and their advantages in evaporation processes.
- (d) Explain the principles and applications of freeze drying in food processing.

- (e) Discuss the significance of steam tables in food processing operations. Explain how steam tables are utilized to determine properties of steam.
- (f) Elaborate on the various factors influencing the choice of sterilizers in food processing, comparing batch and continuous types.

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