

**CARMEL COLLEGE OF ARTS, SCIENCE AND COMMERCE, NUVEM – GOA**

**POST GRADUATE DEGREE STUDIES (AFFILIATED TO GOA UNIVERSITY)**

**M.Sc. (I) Food Technology (Semester I) Examination January 2021**

**FTC 203 FOOD ENGINEERING**

**Max. Marks: 45**

**Duration: 2 hours**

**Date: 20 January 2021**

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**INSTRUCTIONS:**

1. All questions in **Section I** are compulsory.
  2. Answer **any 3** questions from **Section II**
  3. Figures on the right indicate maximum marks assigned to the question
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**SECTION I**

**Q1. Pen a neat figure of the following and mention function of each component. (3 × 1 mark = 3 marks)**

- a. Pneumatic Dryer.
- b. Falling Film Evaporator.
- c. Electric Kettle.

**Q2. Differentiate between the following briefly.**

**(3 × 1 mark = 3 marks)**

- a. Spraying vs. Immersion Cryogenic system.
- b. Thermal Conductivity vs. Thermal Diffusivity.
- c. Steaming Economy vs. Drying Efficiency.

**Q3. Answer any three of the following:**

**(3 × 3 marks = 9 marks)**

- a. Working of Thermal Vapour Compression Evaporator System.
- b. Freezing curve of water.
- c. Principles of steady and unsteady heat transfer.
- d. A nozzle with a radius of 0.45 cm is attached to a ketchup pumping line with a radius of 0.75 cm. The flow rate through hose and nozzle is 0.7 L/s. Calculate the flow rate of the ketchup (a) in the hose and (b) in the nozzle.

**P.T.O.**

## SECTION II

- Q4. a.** What is radiative heat? Elaborate on its mechanism of heat transfer. (3)  
**b.** Explain in detail the components and working of a Microwave oven, while listing the factors that affect microwave cooking. (7)
- Q5. a.** Describe the mechanism of size reduction via grinding. What laws affect this process? (6)  
**b.** Diagrammatically explain the working of Jaw crushers and Roller grinders. (4)
- Q6. a.** Explain the boiling curve and comment on its relevance to the distillation process. (5)  
**b.** With the help of a labelled diagram and an example, explain fractional distillation. (5)
- Q7. a.** Elaborate on the Refrigeration Cycle of a Mechanical Vapour Compression Refrigerator. (7)  
**b.** What are Refrigerants? What is its role in the Refrigeration cycle? (3)

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