



**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Food Engg) 2016 Admission**  
**IV Semester Final Examination-July 2018**

Fden.2207

**UNIT OPERATIONS IN FOOD ENGINEERING(2+1)**

**Marks: 50**

**Time:2 hours**

- 1 **Choose the Correct Answer.** (10x1=10)
- 1 Which rule is commonly used to describe boiling point rise of a solution?
    - a) Pearson rule
    - b) Duhring rule
    - c) Stephan-Boltzman law
    - d) Fick's law
  - 2 For separation of milk a faster process is:
    - a) Separation by gravity
    - b) Separation by frictional force
    - c) Separation by centrifugal force
    - d) None of the above
  - 3 A liquid mixture is separated into individual compounds or in some cases groups of components by vaporization is called:
    - a) Distillation
    - b) Coagulation
    - c) Granulation
    - d) Evaporation
  - 4 Irradiation of food is:
    - a) Thermal process
    - b) Non-thermal process
    - c) High pressure process
    - d) Impregnation process
  - 5 Microwave frequency which is permitted for commercial application in processing in India, is:
    - a) 2450 MHz
    - b) 2.45 MHz
    - c) 2540 MHz
    - d) 2.54 MHz
  - 6 Cryogenics can be effectively used for:
    - a) Rice milling
    - b) Oil milling
    - c) Spice milling
    - d) Pulse milling
  - 7 Supercritical fluid extraction technique is suitable for extraction of:
    - a) Essential oil
    - b) Protein
    - c) Carbohydrate
    - d) Germ oil
  - 8 In membrane separation process, the feed mixture is separated into:
    - a) Retentate
    - b) Permeate
    - c) Both a & b
    - d) None of the above
  - 9 Crystallization is considered which of the following separation processes:
    - a) Liquid-liquid
    - b) Solid-liquid
    - c) Solid-gas
    - d) Liquid-gas
  - 10 Extrusion technology is a:
    - a) LTLT process
    - b) UHT process
    - c) HTST process
    - d) All of the above

**P.T.O**

2. **Write short notes/answers etc on ANY FIVE** **(5x2=10)**
- 1 Define the term "boiling point elevation".
  - 2 State the difference between leaching and extraction
  - 3 Extrusion cooking.
  - 4 Sedimentation and Centrifugal separation.
  - 5 Mixing and various mixing equipments.
  - 6 Two advantages of vapour recompression system.
  - 7 The principle of size reduction.

**III Answer any FIVE of the following.** **(5x4=20)**

- 1 The principle of microwave heating.
- 2 Cryogenic grinding and its advantages over other conventional grinding techniques.
- 3 What is "Food Irradiation"? Explain about irradiation technologies.
- 4 Super critical fluid extraction
- 5 In the concentration of orange juice a fresh extracted and strained juice containing 7.08 wt% solids is fed to a vacuum evaporator. In the evaporator, water is removed and the solids content increased to 58 wt% solids. For 1000 kg/h entering, calculate the amounts of the outlet streams of concentrated juice and water.
- 6 Nucleation and crystal growth in crystallization process.
- 7 Membrane separation and types of membranes used in membrane separation process.

**IV Write an essay on any ONE of the following** **(1x10=10)**

- 1 Advantages of multiple effect evaporators. Explain the various types of multiple effect evaporators with neat sketch.
- 2 Types of extruders and explain different zones in an extruder with a neat sketch.

\*\*\*\*\*