



Fden.2207

**KERALA AGRICULTURAL UNIVERSITY**  
**B.Tech.(Food Engg) 2017 Admission**  
**IV Semester Final Examination-June 2019**

**Unit Operations in Food Engineering (2+1)**

**Marks: 50**  
**Time: 2 hours**

**I Fill up the blanks (10x1=10)**

- 1 Dimensions are measured in terms of -----.
- 2 The overall mass balance for a single effect evaporator is given by  $m_f =$  -----.
- 3 The critical speed of ball mill is given by  $n_c =$  -----.
- 4 The liquid phase remaining after the formation of the crystals is called as -----.
- 5 Fractional distillation is carried out in -----unit.

**State True or False**

- 6 McCabe – Thiele plot is used in Contact Equilibrium separation.
- 7 Liquid CO<sub>2</sub> is otherwise known as dry ice.
- 8 Washing is almost identical to extraction.
- 9 Filtration rate depends on the pressure drop across the filter medium.
- 10 The simple distillation works in a continuous mode.

**II Write short notes on ANY FIVE (5x2=10)**

- 1 Unit operation.
- 2 Comminution.
- 3 Working of cyclone separator.
- 4 Principle of constant pressure filtration.
- 5 Differentiate distillation and evaporation.
- 6 Nucleation.
- 7 Extrusion cooking.

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

- 1 The mass and energy balance for a multiple effect evaporator.
- 2 The power required to grind wheat having initial grain size of 4.33 mm to final flour particle size of 0.351 mm is 8 kW. The feed rate is 200 kg/h. Calculate the power required to grind the same wheat to 0.157 mm by the same mill using Rittinger's Law.
- 3 Ultra filtration and mention its application in food industry.
- 4 Explain the leaching process with a diagram.
- 5 Flash distillation process.
- 6 Construction and working of an evaporative crystallizer.
- 7 Application of food irradiation process.

**IV Answer any ONE of the following (1x10=10)**

- 1 Various evaporators used in food industry.
- 2 Various particle mixing and liquid mixing equipments.

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