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53 (FPT 503) FPEN

2019

FOOD PROCESS ENGINEERING

Paper : FPT 503

Full Marks : 100

Time : Three hours

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

Answer **any five** questions.

- (a) What do you mean by evaporation? How it differs from distillation? Discuss the different factors which affect evaporation. 10

(b) Discuss Forward feed system in Multiple Effect Evaporator with neat labelled diagram. 10

Contd.

2. (a) Calculate EMC of brinjal seed at RH = 10% and $T = 50^{\circ}\text{C}$. using Henderson's equation. 10
 (Given $c = 6.5 \times 10^{-6}$ and $n = 1.8$.)
- (b) 500 kg of paddy at 22% Moisture Content (W_b) is dried to 14% MC (W_b) for milling. Calculate the amount of moisture removed in drying. 10
3. Write short notes on: 5×4=20
- (a) Degree of saturation
- (b) Spray dryer
- (c) Hysteresis effect
- (d) Kick's law (Size reduction).
4. Differentiate the following: 5×4=20
- (a) Thin-layer drying and Deep-bed drying
- (b) Constant-rate period and Falling-rate period
- (c) Humidification and Dehumidification
- (d) Drying and Dehydration.
5. (a) Describe a typical humidification equipment. 10

- (b) Describe Jaw Crusher with neat labelled diagram. 10
6. The humidity ratio of atmospheric air at 20°C dry-bulb temperature and 101.32 kPa is 0.012 kg/kg of dry air. Determine —
- (a) Relative humidity
- (b) Degree of saturation
- (c) Humid volume.
- (Data given partial Pr. of water vapour – 0.019 bar
 Dew point temp. – 17°C
 Saturation pressure of vapour – 0.032 bar
 $10+10=20$)
7. (a) How rising film evaporator is different from falling film evaporator? 10
- (b) Discuss the range of applicabilities of Crushing laws. (size reduction). 10

