Total No. of printed pages = 7

END SEMESTER EXAMINATION – 2020

Semester : 6th

Subject Code : FPT-601

FOOD ENGINERRING OPERATIONS – II

Full Marks – 70

Time – Three hours

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

Instructions :

1. *All* questions of PART–A are compulsory.
2. Answer any *five* questions from PART–B.

PART – A

Marks – 25

1. Fill in the blanks : 1×5=5

   (a) When humidity of air increases, the drying rate slightly _____.

   (b) In Microwave oven, heat generates due to _____.

[Turn over

(c) The unit of universal gas constant is _____.

(d) Complete removal of moisture content is called _____.

(e) Temperature of LTLT pasteurization is _____.

2. Write true or false : 1×10=10

(a) Wave guide is used in extrusion system.

(b) 13.56 KHz is a radio frequency.

(c) Twin screw extruders can handle viscous, oily, sticky or very wet material.

(d) Precooked rice is an example of extruders.

(e) If wet bulb temperature is same as dew point temperature the relative humidity of air will be 100.

(f) When moisture is removed from air at constant dry bulb temperature, the process is known as dehumidification.

(g) Case hardening in food takes place by improper drying.

(h) 160-180°C is best suitable for deep-fat frying.

(i) WHO activities are more related to the processing and food preservation.

(j) Holding time under high temperature short time milk pasteurizer is 15 second.

3. Choose the correct answer : 1×10=10

(a) Microwave oven as dryer is best example of

(i) Radiation drying

(ii) Conventional drying

(iii) Vacuum drying

(iv) Di-electric drying

(b) In twin screw extruder, screw extruders run at speed of

(i) 100-400 rpm

(ii) 20-60 rpm

(iii) 10-20 rpm

(iv) None of the above

(c) Heat for cooking of food materials in extrusion is achieved by

(i) Shear and friction

(ii) Crushing and shearing

(iii) Pressure and friction

(iv) Compression and external heat source

(d) An extruder is a _____ unit

(i) Thermodynamic

(ii) Pneumatic

(iii) Chemical

(iv) Mechanical

(e) Psychometrics chart is made for

(i) One atmospheric pressure

(ii) Any pressure

(iii) Below atmospheric pressure

(iv) All of the above

(f) The device used for extrusion cooking is termed as

(i) Pressure vessel

(ii) Magnetron

(iii) HTST Cooker

(iv) Extruder

(g) Which one of the following is not an example of radiation drying ?

(i) Sun drying

(ii) Infrared drying

(iii) Di-electric drying

(iv) None of the above

(h) Homogenization is purely a _____ process.

(i) Physical

(ii) Drying

(iii) Both (i) and (ii) above

(iv) None of the above

(i) Most effective evaporator is a _____ type.

(i) Plate

(ii) Rising film

(iii) Falling film

(iv) None of the above

(j) In thin layer drying of food grains, the thickness of the layer is limited to

(i) 10 cm (ii) 20 cm

(iii) 30 cm (iv) 40 cm

PART – B

Marks – 45

9×5=45

4. (a) Compare microwave heating with conventional heating citing some examples. 4

   (b) With schematic diagram discuss how micro-waves generate heat in a food material. 5

5. (a) What is an extruder ? Discuss the popularity of extrusion cooking. 4

   (b) Write advantages of twin screw extruders over single screw extruder. 5

6. (a) Describe relationship between relative humidity and percentage humidity. 4

   (b) How de-humidification of air is done ? Describe a typical humidification equipment with neat labelled diagram. 5

7. (a) What is meant by dehydration ? 3

   (b) How drying is different from other unit operation like distillation and evaporation ? 6

8. Differentiate the following :

   (a) Twin screw extrusion and single screw extrusion. 4½

(b) Wet bulb temperature and dry bulb temperature. 4½

9. (a) What is drying rate curve ? 4

(b) What is meant by constant rate period and falling rate period ? 5

10. Write short notes on :

(a) Equilibrium moisture content 3

(b) Magnetron 3

(c) Homogenization. 3