Total No. of printed pages = 7

END SEMESTER EXAMINATION – 2021

Semester : 5th- (New)

Subject Code : FPT-502

FOOD ENGINEERING OPERATIONS - I

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 *nine* questions from PART – B.

PART – A

Marks – 25

Answer the following questions as directed : 1×25=25

1. Write two frequency ranges used for microwave heating used in India.
2. Which part is called heart of microwave heating ?

[Turn over

3. How heat generates in Microwave heating ?

4. In twin screw extruder, Screw extruders run at a speed of_____. (Fill in the blank)

5. In microwave drying, the quality of the product is better because of uniform heating. (Write true/ false)

6. The waveguide in the microwave dryer used to direct the energy internally to transfer energy to the heating chamber. (Write true/false)

7. In microwave heating, heat is not applied to the food item. (Write true/false)

8. The transformation of product during extrusion is (Irreversible or Reversible) ?

9. Which one of the flows not occurs in extrusion cooking ?

(a) Drag flow (b) Heat flow

(c) Pressure flow (d) Leakage flow

(Choose the correct option)

10. Microwave oven is a best example of

(a) Radiation drying

(b) Dielectric drying

(c) Pneumatic drying

(d) Vacuum drying

(Choose the correct option)

11. The process of forming crystals from solution is known as _____. (Fill in the blank)

12. The solubility and particle size of a solute is given by an equation known as ———. (Fill in the blank)

13. Homogenization of milk must have 90% of fat globules smaller than _____ in diameter.

(a) 1μ (b) 2 μ

(c) 3 μ (d) 4μ

(Choose the correct option)

14. Pasteurization of milk is to be carried out at a minimum temperature of

(a) 135°C (b) 90°C

(c) 71°C (d) 62°C

(Choose the correct option)

15. Belt conveyors is used for material transportation over long distances. (Write true/false)

16. Belt conveyors are used to transport the material not only in straight direction, but also in bend positions. (Write true/false)

17. Powder material is used to transport using which instrument ?

    (a) Roller conveyors

    (b) Pneumatic dryers

    (c) Belt conveyors

    (d) Screw conveyors

    (Choose the correct option)

18. Write two importance of material handling in food processing.

19. What are the various lifting gadgets used in food processing ?

20. The device used for extrusion cooking is termed as

    (a) Pressure vessel (b) Sterilizer

    (c) HTST Cooker (d) Extruder

    (Choose the correct option)

21. An extruder is a ——— unit.

(a) Mechanical (b) Thermodynamic

(c) Pneumatic (d) Hydraulic

(Choose the correct option)

22. Basic components of an extruder are

(a) Screw, die and barrel

(b) Screw, feed hooper and breaker plate

(c) Die, feed hooper and breaker plate

(d) Barrel, feed hopper and other parts

(Choose the correct option)

23. Ribbon mixers are generally used for blending solids. (Write true/false)

24. Write two applications of material handling systems in food processing industries.

25. Only disadvantages with pneumatic conveying is high energy costs for pumping large quantities of air under high pressure. (Write true/false)

PART – B

Marks – 45

Each question carries 5 marks : 5×9=45

1. Describe a batch crystallizer with neat diagram explaining its application in food processing.

2. What do you mean by Extrusion ? Why it is more acceptable by consumers ?

3. What are the benefits of using microwaves heating system in food processing ?

4. What are microwaves, and what are their frequency ranges ?

5. Describe the functioning of the magnetron in micro- wave heating system.

6. How Microwaves generate heat in a food material ?

7. Write the law of conservation of energy ?

8. What is the importance of material handling in food processing ?

9. Describe a pneumatic conveyor with a neat diagram and its application in food processing.

10. Write the effects of extrusion on the nutritional quality of foods.

11. Write all the different steps to be followed during energy balances.