B.Sc. FOOD SCIENCE & TECHNOLOGY
Second Semester
FOOD PROCESS ENGINEERING-I
(BFST – 205)

Duration: 3Hrs.

Full Marks: 70

Part-A (Objective) =20
Part-B (Descriptive) =50

(PART-B: Descriptive)

Duration: 2 hrs. 40 mins.

Marks: 50

Answer any *four* from *Question no.* 2 to 8
Question no. 1 is compulsory.

1. Explain different physical and rheological properties of agricultural raw materials.

$(5+5=10)$

2. What are the different size reduction procedures? Explain the working principle of a Hammer mill with suitable feature. $(4+6=10)$

3. What do you mean by superheating and sub cooling in case of refrigeration? Explain the working principle of a refrigeration cycle with suitable diagram.

$(2+2+6=10)$

4. What is boiler? What are the different types of boiler? Explain different size reduction laws. $(1+3+6=10)$

5. Write down different fan laws. What are the different types of equipment used for the packaging of fruits and vegetables products? Explain any one of them with proper application. $(3+2+5=10)$

6. Define the terms: $(2×5=10)$

(i) Salvage value   (ii) Break Even Point   (iii) Depreciation

(iv) True density   (v) Thermal Diffusivity

7. One ton of mango fruit at 35 ^{0}C is to be cooled to 4 ^{0}C in 8 hours. The radiation and other losses are estimated to be 10 percent of the refrigeration load. Find the tonnage of refrigeration and horsepower of the motor to be used if the efficiency of the motor is 85 percent. (Specific heat of mango 3.74 kJ/kg K)   (10)

8. Define recycling. Name a commodity which can be mostly recycled in food industry. What are the parameters involved in food waste treatment?   (2+1+7=10)

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Duration: 20 minutes   Marks – 20

(PART A - Objective Type)

I. Choose the correct answer: 1×20=20

1. Size reduction of grains is caused by impact in…………………..
   a. Gyratory Crusher   b. Crushing roll
   c. Hammer mill   d. Jaw Crusher

2. In size reduction of fine powders, which of the following law is more applicable?
   a. Kick'law   b. Rittenger's law
   c. Bond's law   d. All of the above

3. Which one is non-Newtonian fluid?
   a. Bingham   b. Pseodoplastic
   c. Thixotropic   d. All of the above

4. The heart of the refrigeration system is……………………………
   a. Condenser   b. Evaporator
   c. Water Pump   d. Compressor

5. The capacity of Bukhari type storage structure is…………………………
   a. 0.5-1 tonnes   b. 3.5-18 tones
   c. 18.5-28 tonnes   d. 20-25 tones

6. Time of freezing of food is longer than that for thawing. The reason for this is…………..
   a. Water has higher thermal conductivity than ice.
   b. Water has higher density than ice.
   c. Water has lower thermal conductivity than ice.
   d. Water higher thermal diffusivity than ice.

7. Separation of liquid from solids by the application of pressure is known as…………….
   a. Extraction   b. Expression
   c. Filtration   d. Leaching

8. Pascal is a unit of……………………………..
   a. Displacement   b. Temperature
   c. Pressure   d. Viscosity

9. In breakeven analysis, the total cost consists of…………………..
   a. Fixed cost   b. Variable cost
   c. Fixed cost + variable cost   d. Fixed cost +variable cost +profit

10. Latent heat is a heat due to which phase change occurs at a constant………………………..
    a. Temperature   b. Pressure
    c. Time   d. None of these

11. Specific gravity separator is used for grading the seed on the basis of
    a. Same size but different specific gravity.
    b. Same size and same specific gravity.
    c. Different size and different specific gravity.
    d. Different size and same specific gravity.

12. A cyclone separator is used for separating………………………………..
    a. Particles from liquid   b. Liquid droplets from gases
    c. Fine particles from solid   d. All of the above

13. For transportation of grains, belt speed in belt conveyor should not be more than……………
    a. 2.5 m/s   b. 3.5 m/s   c. 4.5 m/s   d. 5.0 m/s

14. The constant of proportionality in relating stress and strain for elastic bodies is known as……….
    a. Young's modulus   b. Bulk modulus
    c. Rigidity modulus   d. None of the above

15. The power observed by a fan varies in direct proportional to the……………..of the fan speed.
    a. Cube   b. Square
    c. One by fourth   d. None of theses

16. The pressure developed by a fan is directly proportional to the …………………of impeller diameter.
    a. Cube   b. Square
    c. One by fourth   d. None of theses

17. Solid food materials are generally………………………………
    a. Elastic   b. Viscous
    c. Viscoelastic   d. Plastic

18. The jenssen formula is used to determine the pressure in a……….
    a. Shallow bin   b. Deep bin
    c. Dam   d. None of these

19. Separation of grain by screening is done on the basis of…………………..
    a. Size   b. Colour
    c. Texture   d. None of these

20. The equipment used for generation of steam…………………..
    a. Boiler   b. Cooler
    c. Evaporator   d. Dryer

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