Q.28 Calculate the change in enthalpy (DH) when 1 kg of water is heated from 20^0C to 80^0C.

Q.29 Describe the operation of a manometer and its use in measuring fluid pressure.

Q.30 Compare and contract positive displacement pumps and centrifugal pumps in terms of principles types and applications in the food industry.

Q.31 Differentiate between conduction, convection and radiation as modes of heat transfer in food processing. Provide examples for each.

Q.32 Discuss the advantages and disadvantages of different types of heat exchangers used in food processing.

Q.33 Explain the selection criteria for choosing a pasteurized in the food industry.

Q.34 Outline the key steps involved in the periodic maintenance of an autoclave used for food sterilization.

Q.35 Describe the principle of psychrometry and its significance in food storage and processing.

SECTION-D

Note: Long answer questions. Attempt any two questions out of three Questions. (2x10=20)

Q.36 Explain the concept of mass balance and its application in a food processing unit operation of your choice.

Q.37 Discuss the principles of operation and key considerations in selecting a suitable pump for transporting viscous food products. Provide examples of such products.

Q.38 Discuss the three modes of heat transfer (conduction, convection and radiation) in the context of food processing. Provide examples of each mode's application in the food industry.

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Roll No. .....

4th Sem.

Branch : Food Tech.

Sub. Principles of Food Engineering

Time : 3 Hrs. M.M. : 100

SECTION-A

Note: Multiple type Questions. All Questions are compulsory. (10x1=10)

Q.1 Psychrometry deals with the properties of
a) Gases b) Liquids
c) Solids d) Plasma

Q.2 Which property is NOT typically considered in psychrometry?
a) Humidity b) Temperature
c) Pressure d) Density

Q.3 What is the SI unit of specific gravity?
a) Dimensionless
b) Kilograms per cubic meter (kg/m^2)
c) Watts per meter per Kelvin (W/mk)
d) Joules (J)

Q.4 Porosity of a material is a measure of
a) Its color b) Its density
c) The void spaces within d) Its thermal conductivity

Q.5 In material balance calculation, what is the term "System boundaries" used for?
a) Defining the mass of a system
b) Defining the energy balance equation
c) Establishing the boundaries of a control volume
d) Determining the specific heat of a substance

Q.6 Heat transfer in which energy is transferred by the movement of fluids (liquids or gases) is known as :

a) Conduction b) Convection
c) Radiation d) Diffusion

Q.7 Which of the following statements is true about laminar flow?

a) It has high turbulence and chaotic motion
b) It is characterized by smooth, parallel layers of fluid
c) It typically occurs at high Revnolds numbers
d) It is only observed in compressible fluids

Q.8 What type of pump is commonly used for the precise measurement and delivery of small volumes of liquid in the food industry?

a) Centrifugal pump
b) Gear pump
c) Diaphragm pump
d) Axial flow pump

Q.9 Which mode of heat transfer does not require a medium for propagation?

a) Conduction b) Convection
c) Radiation d) Conduction & convection both

Q.10 What is the purpose of a heat exchanger in food processing?

a) To generate heat
b) To exchange mass between two fluids
c) To remove heat from one fluid and transfer it to another
d) To mix different food ingredients

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 What unit is commonly used to measure temperature in the international system of units (SI)?

Q.12 Convert 1 kilogram (kg) to grams (g).

Q.13 Define specific gravity in the context of food materials.

Q.14 Why is the measurement of porosity important in food processing?

Q.15 Define thermal diffusivity.

Q.16 Why is knowledge of specific heat important in food processing?

Q.17 Explain the principle of material balance in food processing.

Q.18 Define enthalpy and its significance in energy balance calculations.

Q.19 What is the purpose of a manometer in fluid mechanics?

Q.20 Explain the significance of the Reynolds number in fluid flow characterization.

SECTION-C

Note: Short answer type Questions. Attempt any twelve questions out of fifteen Questions. (12x5=60)

Q.21 Explain the importance of standard units of measurement in food engineering.

Q.22 Convert 1 meter (m) to inches (in) and feet (ft).

Q.23 Discuss the significance of color in food quality and consumer perception.

Q.24 Explain how porosity affects the flow characteristics of food materials.

Q.25 Define thermal conductivity and its relevance in food processing.

Q.26 Calculate the thermal diffusivity of a food material if its thermal conductivity is 0.5 W/mk, and its specific heat is 1 kJ/kg^0C.

Q.27 Explain the concept of material balance and its application in food processing.