Total number of printed pages = 3

19/4th Sem/DFET 401

2022

ELEMENTS OF FOOD ENGINEERING-II

Full Marks – 100

Time – Three hours

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

Answer any *five* questions.

1. (a) Define : Specific weight and Specific volume. 2×3=6

   (b) Distinguish between Fluid statics and Fluid dynamics. 2+2=4

   (c) Calculate the specific weight, density and specific gravity of 2 litre of a liquid which weighs 7N. 4+3+3=10

2. (a) What is viscosity ? Explain how viscosity varies with temperature. 2+4=6

   (b) Establish a relationship between S.I. unit and C.G.S. unit of viscosity. 6

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(c) A plate, 0.025 mm distant from a fixed plate, moves at 50 cm/s and requires a force of 2N per unit area to maintain this speed. Determine the fluid viscosity between the plates. 8

3. (a) Describe the classification of Fluids with suitable diagram. 2+8=10

(b) State and explain Newton's law of viscosity. 5

(c) What is Kinematic viscosity ? Explain. 5

4. (a) Explain the classification of fluid flows. 8

(b) State continuity equation and derive an equation for Compressible fluids. 2+4=6

(c) The diameters of a pipe at the sections 1 and 2 are 25 cm and 30 cm respectively. Find the discharge through the pipe if the velocity of water flowing through the pipe at section 1 is 7 m/s. Determine also the velocity at section 2. 6

5. (a) What are the different types of losses of energy in pipes ? 3

(b) Derive Darcy equation for loss of head due to friction in pipes. 8

(c) Find the head lost due to friction in a pipe of diameter 300 mm and length 70m through which water is flowing at a velocity of 6 m/s using

(i) Darcy formula and

(ii) Chezzy's formula.

Take $\nu = 0.01$ stoke. 5+4=9

6. (a) State the various methods of food preservation. 4

(b) Explain the application of refrigeration for food preservation. 6

(c) Explain the Reynold's experiment with neat sketch. 10

7. Write short notes on any *two* of the following : 10×2=20

(a) Specific gravity

(b) Discharge

(c) Euler's equation of motion

(d) Chezzy's equation for loss of head due to friction in pipes.