Total No. of printed pages = 4

END SEMESTER EXAMINATION – 2019

Semester – 4th

Subject Code : FPT-401

ELEMENTS OF FOOD ENGINEERING–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. Answer the following questions : 1×15=15

   (i) What is weight density ?

   (ii) What is dynamic viscosity ?

   (iii) Define laminar flow.

   (iv) State Bernoulli's equation.

   (v) What is fluid ?

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(vi) Write down the Euler's equation.

(vii) What is the main difference between a centrifugal pump and a reciprocating pump ?

(viii) State some advantages of food preservation.

(ix) What is Psychrometry ?

(x) Define relative humidity.

(xi) What is dry bulb temperature ?

(xii) Define continuity equation.

(xiii) Write down the Navier-Stokes equation of motion.

(xiv) Define SFEE.

(xv) State Newton's law of viscosity.

2. Fill up the blanks : 1×5=5

(i) According to Darcy's fotmula, h_f = ____.

(ii) Water is ____ liquid.

(iii) A manometer is used to measure ____.

(iv) Centrifugal pumps are ____ than reciprocating pumps.

(v) 1 poise = ____ Ns/m^2.

3. Write true or false : 1×5=5

(i) The unit of pressure is N/m^2.

(ii) In Bernoulli's equation, it is assumed that the fluid is compressible.

(iii) A flow in which the quantity of liquid flowing per second is constant, is called steady flow.

(iv) Specific volume is defined as the volume per unit mass of the liquid.

(v) Centrifugal pumps are mostly used for domestic purpose.

PART – B

Marks – 45

4. (a) Explain the Reynold's experiment with neat sketch.

(b) Write down the assumptions made during the analysis of SFEE. 6+3=9

5. (a) Define mass transfer co-efficient.

(b) Explain Fick's law of diffusion. 4+5=9

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

   (b) Explain the application of refrigeration for food preservation. 4+5=9

7. (a) The diameters of a pipe at the sections 1 and 2 are 20 cm and 25 cm respectively. Find the discharge through the pipe if the velocity of water flowing through the pipe at section 1 is 6 m/s. Determine also the velocity at section 2.

   (b) Determine the specific gravity of a fluid having viscosity 0.06 poise and kinematic viscosity 0.035 stokes. (Density of water 1000 kg/m^3) 5+4=9

8. 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 4 m/s using

   (i) Darcy formula and

   (ii) Chezzy's formula.

   Take v = 0.01 stooke. 5+4=9

9. Define : 3×3=9

   (a) Humidity

   (b) Absolute humidity

   (c) Losses in pipe flow.