Total No. of printed pages = 4

FPT-401/EoFE-II/4th Sem/2018/M

ELEMENTS OF FOOD ENGINEERING - II

Full marks – 70

Time – Three hours

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

PART – A

1. Answer the following questions : 1×15=15

   (i) What is density ?

   (ii) What is kinematic viscosity ?

   (iii) Define rotational flow.

   (iv) State Bernoulli's Equation.

   (v) What is Fluid ?

   (vi) Write down the Euler's equation.

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

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(viii) State some advantages of food preservation.

(ix) What is Psychrometry ?

(x) Define humidity.

(xi) What is wet bulb temperature ?

(xii) Define continuity equation.

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

(xiv) Define SFEE.

(xv) What is steady flow ?

2. Fill up the blanks : 1×5=5

(i) According to Darcy's formula, $h_f = \frac{\text{.....}}{\text{.....}}$.

(ii) Water is ..... liquid.

(iii) A manometer is used to measure ..... .

(iv) Low lifting centrifugal pumps work against heads upto ..... m.

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

3. Write true or false : $1 \times 5 = 5$

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

(ii) In Bernoulli's Equation, it is assumed that the fluid is incompressible.

(iii) A flow, in which the quantity of liquid flowing per second is not constant, is called steady flow.

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

(v) The cost of reciprocating pump is costlier than centrifugal pump.

PART – B

Answer any *five* questions.

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

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

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

(b) Find the head lost due to friction in a pipe of diameter 300mm and length 70m through which water is flowing at a velocity of 5m/s using Darcy's formula. Take $\nu = 0.01$ stoke. $5+4=9$

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

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

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

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

5. (a) State Newton's law of viscosity. Explain how viscosity varies with temperature.

(b) Determine the specific gravity of a fluid having viscosity 0.05 poise and kinematic viscosity 0.035 stokes. (Density of water 1000 kg/m^3) 2+3+4=9

6. Define : 3×3=9

(a) Humidity

(b) Relative humidity

(c) Dry bulb temperature.