Reg. No. : | | | | | | | | | | |

Question Paper Code: 53903

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Chemical Engineering

15UCH303 - FLUID MECHANICS FOR CHEMICAL ENGINEERING

(Regulation 2015)

Duration: 1.15 hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. A small shear force is applied on an element and then removed. If the element regains it's original position, what kind of an element can it be? CO1- R

   (a) Solid (b) Liquid (c)Fluid (d) Gaseous

2. Which of the following is a shear-thinning fluid CO1- R

   (a) Bingham plastic (b) Rheopectic (c) Dilatant (d)Pseudoplastic

3. Which of the following cannot be the value of absolute pressure of a fluid at any point? CO2- R

   (a) 1.013 bar (b) 0 (c) -1 bar (d) 200 bar

4. Navier- Stokes equation describes the motion of _____ CO2- R

   (a) Solid substance (b) Non-viscous fluid (c) Viscous fluid (d) Gas

5. The fundamental dimensional quantities are related by_____ CO3- R

   (a) Avagadaro's law (b) Newton's second law

   (c) Newton's first law (d) Newton's third law

6. Similitude is a concept applicable to the testing of _____ CO3- R

   (a) Mathematical models (b) Physical model

   (c) Chemical models (d) Engineering models

7. Fluid flow at increasing rate through a diverging pipe is an example of ___flow. CO4- R

(a) Steady non - uniform (b) Non steady non uniform

(c) Steady uniform (d) Non steady uniform

8. Which of the factors primarily decide whether the flow in a circular pipe is laminar or turbulent? CO4- R

(a) The Reynolds Number (b) The Prandtl Number

(c) The Pressure gradient along the length of the pipe (d) All of the above

9. In venturi meter, the converging cone angle is of the order of ___degree. CO5- R

(a) 5-7 (b) 7-10 (c) 15-20 (d) 20-25

10. The need for priming is eliminated by providing CO5- R

(a) Negative suction head (b) Positive suction head

(c) Positive discharge head (d) Negative discharge head

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Explain briefly about the types of fluid flow. CO1- U (8)

12. Explain briefly about the fluid friction. CO2- U (8)

13. The pressure difference ΔP in a pipe of diameter D and length l due to viscous flow depends on the velocity v , viscosity μ and density ρ. using Buckingham's pi-theorem obtain an expression for ΔP. CO3- Ana (8)

14. Find the diameter of a particle of specific gravity 2.65 which will havea terminal velocity of 0.5 m/s in water. CO4- U (8)

Take $\mu_w = 10^{-3}$ kg m/ s. Assume $N_{Re,P} = 100$. Find the diameter of a particle of specific gravity 2.65 which will havea terminal velocity of 0.5 m/s in water. Take $\mu_w = 10^{-3}$ kg m/ s.

Assume $N_{Re,P} = 100$.

15. Explain with neat sketch about the working of Reciprocating pump with its discharge curves. CO5 U (8)