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Question Paper Code:55903

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

Fifth Semester

Chemical Engineering

19UCH304- FLUID FLOW OPERATIONS

(Regulation 2015)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Poise is the unit of CO1- R
(a) mass density (b) kinematic viscosity (c) Viscosity (d) velocity gradient
2. Atmospheric pressure in terms of water column is CO2- R
(a) 7.5 m (b) 8.5 m (c) 9.81 m (d) 10.30 m
3. Continuity equation deals with the law of conservation of CO2- R
(a) mass (b) momentum (c) energy (d) none of the above
4. Continuity equation takes the form CO4- U
(a) $A_1V_1=A_2V_2$ (b) $A_1V_1H_1=A_2V_2H_2$ (c) $A_1V_1J_1= A_2V_2H_2$ (d) $A_1=A_2$
5. Turbulent flow generally occurs for cases involving CO6- R
(a) highly viscous fluid (b) very narrow passages
(c) very slow motion (d) none of these
6. Which of the following is dimensionless? CO5- R
(a) Fanning friction factor (b) Angular velocity
(c) Specific volume (d) None of these
7. When a fluid is passed upwards through a bed of particles the CO6- R
pressure loss in the fluid due to frictional resistance _____with
increasing fluid flow
(a) increases (b) decreases (c) remains the same (d) increases and then decreases

8. At superficial velocities above the minimum fluidization velocity, fluidization may in general be CO2- R
- (a) non bubbling (b) bubbling
- (c) either bubbling or non-bubbling (d) both bubbling and non-bubbling
9. In case of a centrifugal pump, the ratio of total delivered pressure to pressure developed with the impeller is called the _____ efficiency CO2- U
- (a) manometric (b) mechanical (c) volumetric (d) overall
10. Molten soap mass is transported by means of a _____ pump CO3- U
- (a) centrifugal (b) reciprocating (c) diaphragm (d) gear

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Determine Mass density, Specific volume, and Specific weight of liquid whose specific gravity is 0.85. CO1- U (8)
12. Derive the equation of continuity in cartesian coordinates assuming the fluid is under steady state and incompressible. CO2- U (8)
13. The resisting force (R) of a supersonic flight can be considered as dependent upon length of aircraft (l), velocity (V), air viscosity ' μ ', air density ' ρ ', and bulk modulus of air ' k '. Express the functional relationship between these variables and the resisting force. CO5- E (8)
14. Explain in detail about the principle and working of reciprocating pump with neat diagram and equation for discharge, work done and power required for reciprocating pump CO6- U (8)
15. Discuss Geldart's classification of powders. CO4- U (8)