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

Question Paper Code: 53A04

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

Third Semester

Agricultural Engineering

15UAG304 - FLUID MECHANICS AND HYDRAULICS

(Regulation 2015)

Duration: 1.15 hrs Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. The ratio of weight of fluid to unit volume of fluid is called CO1-R

   (a) Density (b)Specific weight (c)Mass density (d)Viscosity

2. A manometer is used to measure CO1-R

   (a) Low pressure. (b) Moderate pressure.

   (c) High pressure. (d) Atmospheric pressure.

3. It is a type of flow in which the fluid particles while flowing along stream lines, also rotate about their own axis. CO2-R

   (a) Rotational flow (b) Laminar flow (c) Irrotational flow (d)Vortex flow

4. The imaginary line drawn in the fluid in such a way that the tangent to any point gives the direction of motion at that point, is known as CO2-R

   (a) Path line (b) Stream line (c) Steak line (d) Potential line

5. The pressure of the liquid flowing through the divergent portion of a venturimeter CO3- R

   (a) Remains constant (b) Increase

   (c) Decrease (d) Depends upon mass of liquid

6. Which of the following is or are the hydraulic coefficients? CO3- R

   (a) Coefficient of velocity (b) Coefficeint of Contraction

   (c) Coefficient of discharge (d) All of the above

7. The discharge over a rectangular notch is CO4- R

(a) Inversely proportional to $H^{3/2}$ (b) Directly proportional to $H^{3/2}$

(c) Inversely proportional to $H^{5/2}$ (d) Directly proportional to $H^{5/2}$

8. The sheet of water flowing through a notch or over a weir is called CO4-R

(a) Crest (b) Sill (c) Nappe (d) Nacelle

9. Pump is a device which convert CO5- R

(a) Hydraulic energy into electrical energy.

(b) Hydraulic energy into Mechanical energy

(c) Mechanical energy into hydraulic energy.

(d) Mechanical energy into electrical energy.

10. Which of the following is / are the components of centrifugal pump CO5- R

(a) Impeller (b) Casing (c) Suction pipe (d)All of above

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. A U tube manometer is used to measure the pressure of water in a pipe line, which is in excess of atmospheric pressure. The right limb of the manometer contains mercury and is open to atmosphere. The contact between water and mercury is in the left limb. Determine the pressure of water in the main line, if the difference in level of mercury in the limbs of U-tube is 10 cm and the free surface of mercury is in level with the centre of the pipe. If the pressure of water in pipe line is reduced to 9810 N/m^2, calculate the new difference in the level of mercury. Sketch the arrangements in both cases. CO1- App (8)

12. Derive acceleration of a Fluid Particle in Cartesian coordinates CO2- App (8)

13. Discuss in detail water hammer in pipes with neat sketch. CO3- Ana (8)

14. Determine the height of a rectangular weir of length 6 m to be built across a rectangular channel. The maximum depth of water on the upstream side of the weir is 1.8 m and discharge is 2000 litters/s.Take $C_d = 0.6$ and neglect end contractions. CO4-U (8)

15. Discuss in detail sludge pump and vacuum pump CO5- U (8)