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**Question Paper Code: 59713**

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

Third Semester

Agriculture Engineering

19UAG305 – FLUID MECHANICS AND OPEN CHANNEL HYDRAULICS

(Regulation 2019)

Duration: One hour

Maximum: 30Marks

PART A - (6 x 1 = 6 Marks)

**(Answer any six of the following questions)**

1. Shear Stress and rate of shear strain relationship for Newtonian fluid is CO1- R  
(a) Parabolic (b) Hyperbolic (c) linear (d) Inverse type
2. Atmospheric pressure held in terms of water column CO1- R  
(a) 7.5m (b) 8.5m (c) 9.81m (d) 10.30m
3. The flow net is used to determine the CO1- R  
(a) Stream lines (b) Equipotential lines (c) Path line (d) Both (a) and (b)
4. Bernoulli's equation cannot be applied when the flow is CO1- R  
(a) Rotational (b) Turbulent (c) Unsteady (d) All of the above
5. Which of the following is a major loss CO1- R  
(a) Friction loss (b) Shock loss  
(c) Entry loss (d) Exit loss
6. Venturimeter is one of the application of CO1- R  
(a) Equation of continuity (b) Bernoulli's equation  
(c) Light equation (d) Speed relation
7. For a hydraulically efficient rectangular section, b/d is equal to CO1- R  
(a) 1 (b) 2 (c) 0.5 (d) 1/3
8. The discharge over a rectangular notch is CO1- 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  $H^{5/2}$

9. The fluid coming into the centrifugal pump is accelerated by CO1- R  
 (a) throttle (b) impeller (c) nozzle (d) governor
10. Dynamic similarity between the model and prototype is the CO1- R  
 (a) similarity of discharge (b) similarity of shape  
 (c) similarity of streamline function (d) none of the above

PART – B (3 x 8= 24 Marks)

**(Answer any three of the following questions)**

11. Derive the expression for the Hydrostatic Law. CO1- U (8)
12. Derive the Euler's equation of motion and deduce that to Bernouillie's equation. CO2- App (8)
13. An orifice meter with orifice diameter 10cm is inserted in a pipe of 20cm diameter. The pressure gauges fitted upstream and downstream of the orifice meter gives reading of 19.62N/cm<sup>2</sup> and 9.81 N/cm<sup>2</sup> respectively.co-efficient of discharge for the orifice meter is given as 0.6.find the discharge of water through pipe. CO3- App (8)
14. A cipolletti weir of crest length 60cm discharges water .the head of water over the weir is 360mm.find the discharge over the weir iif the channel is 80cm wide and 50cm deep. take Cd=0.60 CO4- App (8)
15. A centrifugal pump is to discharge 0.118m<sup>3</sup>/s at a speed of 1450 r.p.m. against a head of 25m.the impeller diameter is 250mm,its width at outlet is 50mm and manometric efficiency is 75%.determine the vane angle at the outer periphery of the impeller. CO5- App (8)