C09-C-304

3220

BOARD DIPLOMA EXAMINATION, (C-09)

OCT / NOV-2015

DCE - THIRD SEMESTER EXAMINATION

HYDRAULICS

Time : 3 hours] [*Total Marks* : 80

PART - A 3 X 10 = 30

Instructions : (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Define specific gravity and compressibility.
2. State the relation among atmospheric pressur, gauge pressure and vacuum pressure.
3. A Pitot static tube having a coefficient of 0.98 is placed at the centre of a pipe line in which benzene is flowing. The Pitot tube shows a reading of 10 cm. Calculate the velocity at the centre line of the pipe.
4. Draw the neat sketches of the following:
(a) External mouth piece
(b) Convergent mouth piece
(c) Convergent divergent mouth piece
5. State the types of notch.
6. Define weir. State the classification of weirs based on shape of the opening and shape of the crest.
7. Explain the reason for connecting two tanks with a pipe in parallel.
8. Explain the term open channel.
9. State the classification of turbines according to direction of flow along with an example each.
10. Explain with neat sketches surge tank and penstock.

PART - B

10 X 5 = 50

Instructions : (1) Answer any **five** questions.
(2) Each question carries **ten** marks.
(3) Answers should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11. A circular plane of 2 m dia is immersed in water so that its plane makes an angle of 30^0 and the heighest point or plane is 1.6 m below the surface. Find the total pressure and centre of pressure.

12. A vertical tapering pipe has top dia 0.7 m and bottom dia 0.9 m. The water is flowing down in full. The pipe is 6 m long. The frictional loss between top and bottom points may be taken as 0.15 time the velocity head at inlet. The velocity at the inlet is 6 m / sec. Determine the pressure at top in N /mm^2, when the pressure head at the bottom is 8.8 m of water.

13. A partially drowned orifice is 1.6 m wide and 80 cm deep. The water level on one side of the orifice is 1.8 m above the top edge and on the other side the water level is 40 cm below the top edge. Determine the discharge through the orifice, if $C_d = 0.63$

14. The water is discharging over a weir 4 m long under a constant head of 800 m. Using Bazin's formula, determine the discharge over a weir if the channel approaching the weir is 5 m wide and 1 m deep.

15. A pipe 1.2 km long 30 cm is discharging water at a velocity of 2.8 m/s. Find the loss of head due to friction using *(a)* Darcy's formula and *(b)* Chezy's formula $F = 0.018$.

16. Water is flowing at the rate of 16.5 cum/s in an earthen trapezoidal channel with bed width 9 m depth of water 1.2m and side slope 1V:0.5H. Calculate the bed slope, if the value of 'c' in the Chezy's formula is 49.5.

17. With the help of a sketch, briefly explain the working of an air lift pump.

18. (a) Calculate the discharge through a pipe of diameter 15 cm when the difference of pressure head between the two ends of a pipe 600 m apart is 4.5 m of water. Assume F=0.009.

(b) A rectangular channel carries 11.3 m^3 / s with a longitudinal slope of 1 in 1000. Determine the dimensions for the best channel section. Take $C = 55$.

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