

3220
BOARD DIPLOMA EXAMINATION, (C-09)
JUNE - 2019
*** DIPLOMA IN CIVIL ENGINEERING**
HYDRAULICS
THIRD SEMESTER EXAMINATION

Time: 3 Hours

Total Marks: 80

PART - A (10 x 3 = 30 Marks)

Note 1: Answer all questions and each question carries 3 marks

2: Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Estimate the capillary rise or depression in a tube of 3 mm dia. When the tube is immersed in
 - a) Water
 - b) Mercury. Surface tension for water and Mercury at 20⁰C is 0.075N/m and 0.52N/m respectively.
2. Convert the intensity of pressure of 103kN/m² into
 - (a) Pressure head of water
 - (b) Pressure head of mercury
3. A Pitot static tube having a co-efficient 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. An internal mouth piece of dia. 60mm is discharging water under a constant head of 9m. Find the discharge in lit/sec if the mouth piece is running full
5. Differentiate between sharp crested and broad crested weirs.
6. What are the advantages of V notch over a rectangular notch?
7. Mention any four uses of siphon.
8. What do you understand by the term 'most economical section' of a channel?
9. State the classification of turbines according to direction of flow along with an example each.
10. What is hydro electric project? What is its use?

PART - B (5 x 10 = 50 Marks)

Note 1: Answer any five questions and each question carries 10 marks

2: The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. A pair of lock gates 7m high and 6m wide includes an angle of 140⁰ in closed position between them. Each gate is supported on two hinges located at 60cm from top and bottom. If the depth of water on u/s and d/s are 5m and 3.2m respectively, find
 1. Magnitude and position of resultant pressure.
 2. Reaction between the two gates.
 3. Magnitude of hinge reactions.
12. A pipe 200m long slopes down at 1 in 10 and tapers from 0.8 m dia at the high end and 0.4 m dia at the lower end and carries 100 lits of oil of specific gravity 0.85. If the pressure gauge at the lower end reads 50 kPa, determine the velocity at the two ends and the pressure at the high end. Neglect all losses.

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13. A partially drowned orifice is 1.6m wide and 80cm deep. The water level on one side of the orifice is 1.8m above the top edge and on the other side the water level is 40cm below the top edge. Determine the discharge through the orifice, if $C_d = 0.63$
14. a) Calculate the head over a rectangular notch, if the length of the notch is 1.8m and discharge is equal to $6\text{m}^3/\text{sec}$ Take $C_d = 0.623$
b) State the formula for discharge over triangular and trapezoidal notches.
15. A pipe of diameter 20 cm and length 50 m is connected to a tank at one end and other end of the pipe is open to the atmosphere. The velocity of the fluid flowing through the pipe is 2.734 m/s. The pipe is horizontal and the height of water level in the tank is 4 m above the centre of the pipe. Draw HGL and TEL for the pipe. Take $f = 0.009$.
16. A most economical trapezoidal channel is laid with a bed slope of 1 in 2200. Determine the bed width, if the side slope is 1:1. Also find the discharge, if the depth of water is 4m. Take $C = 50$.
17. a) Describe with a neat sketch the Vortex casing of a Centrifugal pump.
b) What is the function of foot valve and strainer in a Centrifugal pump?
- 18A. Water is flowing through a pipe 1500m long with a velocity of 0.8m/s. What should be the diameter of the pipe, if the loss of head due to friction is 8.7m? Take 'f' for the pipe as 0.01.
- B. A rectangular channel of width 4m and depth of water 3m is having a bed slope of 1 in 1500. Find maximum discharge through the channel. Take value of $C = 50$.

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