4227

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH /APRIL-2019
DCE - THIRD SEMESTER EXAMINATION
HYDRAULICS

Time: 3 Hours]   [Max. Marks : 80

PART-A

10x3=30M

Instructions: 1) Answer **all** the questions. Each question carries **three** marks.

2) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1) At a point in a layer of oil, the shear stress is $0.2N/m^2$ and velocity gradient is 0.25m/sec/m. Calculate the coeffient of dynamic viscosity.

2) What is a Piezometer? What are its limitations?

3) What is uniform flow and non-uniform flow? Give one example to each.

4) State the classification of mouthpieces according to shape .

5) A broad crested weir 10m long has a maximum discharge of $10m^3/sec$. Determine the head of water on the upstream side of weir.

*   Take $C_d = 0.62$.

6) What is a notch? Classify the notches based on the shape of opening.

7) State the Darcy-Weisbach equation for head loss due to friction in pipes and name the terms.

8) Differentiate between pipe flow and channel flow in any three aspects.

9) Write any three functions of draft tube.

10) Sketch a typical layout of hydro-electric power plant installation.

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

11) A rectangular body 2m X 4m is immersed inclined to free surface of liquid such that the greatest and least heights are 3m and 1m respectively. Calculate a) total pressure and b) centre of pressure.

12) Water is flowing through a horizontal tapering pipe AB with a discharge of 0.5 cumecs. The diameters at A and B are 300mm and 600mm respectively. If the presure at 'A' is 7m of water, find the pressure at 'B' neglecting the losses.

13) Derive an expression for the discharge through a large rectangular orifice.

14) The catchment area of a tank is 5×10^6 m^2. The maximum rainfall in the catchment is 50mm per hour. Out of this 80% will reach the tank. Find the length of the weir if the head of water is not to exceed 1m. The piers are 1 m wide and clear span is 5.0 m between piers for supporting a superstructure.

15) Two reservoirs are connected by a straight pipe 1.6Km long. For the first half of its length, it is 160mm diameter and then suddenly reduced to 80mm dia. the water leves in the two reserviors differ by 30m. Tabulate all the losses of head and determine the flow in lit/sec. Take f= 0.01 and coefficient of contraction =0.62.

16) (a) A horizontal pipe of diameter 500 mm is suddenly contracted to a diameter of 250mm. If the discharge throughe the pipe is 270 lit/sec, find the practical loss of head due to sudden contraction of pipe.

    (b) A rectangular channel 4m wide and 2m deep is laid at a slope of 1 in 2000. Find the discharge using Kutter's formula taking N = 0.01.

17) A trapezoidal channel has side slopes 2V:3H. It is discharging water at the rate of 25 cumecs with a bed slope 1 in 2000. Design the channel for its best form. Use Manning's formula taking n=0.01.

18) Compare the centrifugal pump with reciprocating pump on different aspects.

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