



C16-C-303

6224

BOARD DIPLOMA EXAMINATION, (C-16)

JUNE—2019

DCE—THIRD SEMESTER EXAMINATION

HYDRAULICS

Time : 3 hours ]

[ Total Marks : 80

PART—A

3×10=30

**Instructions :** (1) Answer **all** questions.

(2) Each question carries **three** marks.

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

1. What is meant by viscosity and write the relationship between dynamic viscosity and kinematic viscosity.
2. Define (a) atmospheric pressure, (b) gauge pressure and (c) absolute pressure.
3. State the Bernoulli's theorem and express it in equation form.
4. What is (a) coefficient of contraction and (b) coefficient of discharge.
5. List the classification of weirs.
6. Write any three minor losses in pipes giving formula for each.
7. Define HGL and TEL.
8. What do you understand by the term most economical section of channel.
9. State the turbines according to the specific speed of the turbine.
10. What are the main components of hydro-electric power plant?

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**PART—B**

10×5=50

**Instructions :** (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer

11. An annular plate 3 m external dia and 1 m internal dia is immersed in an oil of specific gravity 0.8 with its greatest and least depths below the oil surface of 3 m and 1 m respectively. Determine the total pressure and depth of centre of pressure on face of the plate.
12. A venturimeter is to be fitted in a pipe 0.25 m dia where the pressure head is 7.6 m of flowing liquid and the maximum flow is 8.1 m<sup>3</sup>/min. Find the least diameter of the throat to ensure that the pressure head does not become negative. Take coefficient is 0.96
13. Calculate the discharge passing through an orifice 80 cm wide and 60 cm deep in the side of tank. It is having a water level of 3.5 m above the upper edge of the orifice and tail water is 20 cm above the lower edge of the orifice. Take  $C_d = 0.62$
14. A broad crested weir with flat top is constructed across the entire 2.7 m width of a rectangular channel. If the head on the weir crest is 41.5 cm, find the discharge over the weir. Take  $C_d = 0.97$
15. Water flows through a pipe 250 cm diameter 80 m long with a velocity of 3.5 m/sec find the loss of friction using (a) Darcy's formula and (b) Chezy's formula.
16. A horizontal pipe line 50 m long is connected to a water tank at one end and discharges freely in to atmosphere at the other end for the first 30 m of its length from the tank the pipe is 0.2 m dia and its diameter is suddenly enlarged to 0.4 m. The height of water level in the tank is 10 m above the centre of pipe. Calculate all the losses in head and determine the rate of flow. Take  $f = 0.01$
17. A trapezoidal channel has side slopes 1 : 1 and is discharging 20 m<sup>3</sup>/sec with bed slope of 0.5 m per 1000 m. Mannings  $n = 0.01$ . Determine the section of the channel.
18. Explain the working of single acting reciprocating pump with neat sketch.

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