6224

C16-C–303

6224

BOARD DIPLOMA EXAMINATION, (C-16)

JANUARY/FEBRUARY—2022

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. Define mass density, specific weight and specific gravity.

2. State the relation among atmospheric pressure, gauge pressure and absolute pressure.

3. Distinguish between uniform and non-uniform flow.

4. Define orifice. List the different types of orifices according to shape.

5. What is notch? Classify the notches based on the shape of opening.

6. Write any three advantages of triangular notch over rectangular notch.

7. State Chezy's and Darcy's formulae for frictional loss in pipe flow.

8. Define *(a)* wetted perimeter and *(b)* hydraulic mean depth.

9. List the parts of a centrifugal pump.

10. Write any three functions of a surge tank.

PART—B

10×5=50

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

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

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

11. An isosceles triangular plate has a base of 50 cm and height 60 cm. It is immersed vertically such that its apex which is above the base is at a depth of 40 cm from the water surface. Find the total pressure and the depth of centre of pressure.

12. A horizontal Venturi meter 16 cm × 8cm is used to measure the flow of an oil of specific gravity 0.8. Determine the deflection of oil mercury gauge, if the discharge of the oil is 50 liters/sec.

13. A sharp edged orifice of 20 mm dia is discharging water under a constant head of 4 m. The jet drops 1 m in a horizontal distance of 3.9 m. The measured rate of discharge is 1.725 Lit/sec. Find the three hydraulic coefficients.

14. A broad crested weir of 50 m length has 0.5m height of water above its crest. Find the maximum discharge. Take C_d=0.6,neglect velocity of approach.

15. A 2 km long water main has to carry a discharge of 0.54 m^3/sec. If the maximum allowable loss of head due to friction is 26 m.Find the minimum diameter required use Darcy's equation. Assume f = 0.008.Neglect minor losses.

16. Water is discharged through a pipe 1220 m long which is 400 mm in diameter for 610 m length and 250 mm for the rest of its length. Calculate the flow, taking only friction into account, end of the pipe is 30·5 m below the reservoir level. Take f = 0.004 for 400 mm pipe and f = 0.006 for the 250 mm pipe.

17. Design the most economical section of a trapezoidal channel to carry a discharge of 2.833m^3/sec. Adopt bed slope as 1 in 1200 and side slopes 1 vertical to 2 horizontal. Take C in Chezy's formula as 30.

18. Explain with neat sketch the principle and working of Pelton wheel.

★★★