



C14-C-303

4227

BOARD DIPLOMA EXAMINATION, (C-14)
SEPTEMBER/OCTOBER - 2020
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.

1. Define (a) surface tension and (b) capillarity.
2. State any three types of manometer for measuring gauge pressures.
3. Name three energies of fluid in motion.
4. Define orifice. State the classifications according to size.
5. State the classification of notches according to shape of opening.
6. Water is flowing over a rectangular weir 2 m long under a head of 250 mm. Find the discharge by using Francis formula.
7. Define laminar flow and turbulent flow in pipe flow.
8. State three differences between pipe flow and channel flow.

- * 9. State different types of turbine.
10. List out the component parts of hydroelectric power plant.

PART—B

10×5=50

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

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

11. Determine the total pressure and position of center of pressure on a circular plate of diameter 1.5 m which is immersed vertically in water, such that bottom of the plate is 3 m below the free surface of water.
12. Calculate the discharge flowing through 40 cm × 20 cm, horizontal venturi meter having $C_d = 0.98$, if the differential mercury gauge connected to the inlet and throat of meter reads 25 cm of mercury.
13. A rectangular tank 5 m × 3 m contains water to a depth of 1.2 m. The water is discharged through an orifice of area 2000 cm² provided at the bottom to tank. Calculate the time taken to empty the tank completely. Take $C_d = 0.64$.
14. In the laboratory test, conducted over a right angled V notch 40 liters of water is collected in one minute under a head of 45 mm. Calculate the C_d of notch.
- * 15. A 2 km long pipe has to carry a discharge of 0.5 m³/sec and loss of head due to friction is 25 m. Find the diameter of pipe required. Assume $f = 0.008$. Neglect minor losses.
16. A trapezoidal channel having most economical section is 6 m bed width. Find the discharge if the bed slope is 1 in 1200 and the side slope is 1H : 2V. Assume Chezy's constant as 50.

- * **17.** (a) Define total energy line and hydraulic gradient line in pipes.
(b) A rectangular channel carries water at the rate of 300 lit/sec. When bed slope is 0.0005, find the most economical dimensions of the channel, if $C = 50$.
- 18.** Compare the centrifugal pump with reciprocating pump on different aspects.

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