

6224

BOARD DIPLOMA EXAMINATION, (C-16)

OCTOBER/NOVEMBER—2023

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. List out the different properties of fluid. 3
2. Define atmospheric pressure and state the value of standard atmospheric pressure in terms of head of mercury. 3
3. Define stream line flow and turbulent flow. Give one example to each. 3
4. State the classification of mouth pieces according to shape and its position. 3
5. Write any three advantages of triangular notch over a rectangular notch. 1×3
- * 6. How do you differentiate broad crested weir and sharp crested weir? 1½+1½
7. List the major and minor energy losses in pipes. 3
8. Explain the terms (a) wetted perimeter and (b) hydraulic mean depth. 1½+1½
9. Write about (a) volute casing and (b) vortex casing. 1½+1½
10. Write any three functions of surge tank. 1×3

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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 criterion for valuation is the content but not the length of the answer.

- 11.** A sluice gate of breadth 3.2 m and depth 2.6 m is provided under a wall, the height of water on U/S above the top of the gate is 3 m and on D/S it coincides with the top of the gate. Calculate the total pressure and centre of pressure.
- 12.** A pipe 5 m long is inclined at an angle of 30° with the horizontal. The smaller section of the pipe, which is at lower level is 8 cm in dia and the larger section of the pipe is 24 cm dia. Determine the difference of pressure between the two sections, if the pipe is uniformly tapering and the velocity of flow at the smaller end is 1 m/sec.
- 13.** Calculate the discharge passing through an orifice 80 cm wide and 60 cm deep in the side of a tank. It is having water level at 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.** Determine the discharge over a broad crested weir 20 m long with a head of 70 cm over the crest. $C_d = 0.95$ the width of approach channel is 40 m and its depth below the crest of weir is 60 cm.
- 15.** A compound piping system consists of three pipes of lengths 1500 m, 1200 m and 1000 m and of diameters 0.5 m, 0.4 m and 0.3 m respectively are connected in series. Convert the system to
- (a) an equivalent length of 0.4 m dia pipe
(b) an equivalent size pipe of 3700 m long
- 16.** A pipe of 1000 mm dia connects two reservoirs having a difference of level of 6.2 m, if the total length of the pipe is 850 m and rises to a max height of 3.5 m above the level of water in the higher reservoir at a distance of 250 m from the entrance. Find the discharge in the pipe and what is the pressure head at the summit point?

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17. Find the most economical cross-section of a rectangular channel to carry $0.3 \text{ m}^3/\text{sec}$ of water, the bed slope is in 1000. Assume Chezy's 'C' = 60.
18. Differentiate between impulse and reaction turbines.

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