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BOARD DIPLOMA EXAMINATION, (C–16)
OCT/NOV—2018
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 the terms viscosity, capillarity and surface tension.

2. What is manometer? Write the different types of manometers.

3. Write the diffrence between laminar flow and turbulent flow with an example.

4. What is vena-contracta? State the various hydraulic co-efficient.

5. Find the discharge over a rectangular notch having width 2m and a constant head of 30cm. Assume C_d = 0.62.

6. Define weir and classify according to the shape of crest.

7. Define Reynolds' number. How it is useful in determining the type of flow?

8. State Chezy's formula and Manning's formula and name the terms.

9. Define turbine and classify according to the direction of flow of water through runner.

10. State the component parts of a hydroelectric power plant.

PART–B   10×5=50

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

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

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

11. A circular plate 3m in diameter is immersed in water with its greatest and lowest depths below the water surface being 2m and 1m respectively. Find the total pressure and depth of centre of pressure.

12. The diameter of a pipe changes gradually from 150mm at point A to 100mm at point B, which are situated at 20m and 16m respectively above the datum. Determine the pressure at B, if the pressure at A is 0.2 N/mm^2 and velocity of flow at A is 1.1m/sec. Neglect the losses between A and B.

13. *(a)* Define co-efficient of contraction and decuce the relation between the three hydraulic co-efficient.

(b) An internal mouthpiece of diameter 60mm is discharged water under a constant head of 9m. Find the discharge in lit/sec, if the mouthpiece is (i) running free, (ii) running full.

14. Water flows over a rectangular notch of 1m length over a depth of 15cm. If the same quantity of water passing through a right angel triangular notch, find the depth of water through the notch. Take C_d values for rectangular notch and trangular notch as 0.62 and 0.59 respectively.

15. Water flows through a pipe 250cm diameter, 80m long with a velocity of 3.5m/sec. Find the losses in friction by using (a) Darcy's formula, (b) Chezy's formula. Assume Chezy's constant as 55.

16. A main pipe divides into two parallel pipes of 0.8m and 0.5m diameter with equal lengths. Parallal pipes meet again at the lower end. Find the discharge in each parallal pipe, if discharge in main pipe is 2.5 cumec. The Co-efficient of friction for each parallal pipe is same.

17. *(a)* Derive the condition for a rectangular channel section to be most economical.

(b) A rectangular channel having most economical section is 6m wides. Find the discharge , if the bed slope is 1 in 1200. Assume C as 50.

18. List any ten differences between impulse turbine and reaction turbine.

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