



C14-C-303

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BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—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.

1. Calculate the density, specific weight and weight of one liter of petrol of specific gravity = 0.7. 1+1+1=3
2. State the relation among atmospheric pressure, gauge pressure and absolute pressure. 1+1+1=3
3. State the equation of continuity of flow. 3
4. Sketch and name four types of mouthpieces. Also write down the the values of C_d . 3
5. Differentiate between sharp crested weir and broad crested weir. 1½+1½=3
6. List the classifications of weirs. 3

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7. Define critical velocity and Reynolds number. 3
8. Write any three differences between pipe flow and channel flow. $1\frac{1}{2}+1\frac{1}{2}=3$
9. Explain the terms (a) turbines and (b) draft tube. $1\frac{1}{2}+1\frac{1}{2}=3$
10. Sketch a typical hydroelectric installation and name the parts. 3

PART—B

10×5=50

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

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

11. A triangular gate which has a base of 2 m and an altitude of 3 m lies in a vertical plane. The vertex of the gate is 1 m below the surface of a tank which contains oil of specific gravity 0.8. Find the force exerted by oil on the gate and its position. 10
12. A pipe 300 mm long has a slope 1 in 100 and tapers from 1.25 m dia at the high-end to 625 mm dia at the lower end. Determine the pressure at the lower end, if the pressure at the high-end is 0.1 N/mm^2 and the discharge through the pipe is 100 lit/sec of water. 10
13. A tank of cross-sectional area 1.5 sq. m contains water 2 m deep. An orifice of 60 mm dia is provided at its bottom. Find the fall of water level after 2 minutes. Take $C_d = 0.6$. 10
14. Water passing over a rectangular notch flows subsequently over a right angled triangular notch. The length of the rectangular notch is 0.6 m and its coefficient of discharge is 0.62 if the coefficient of triangular notch is 0.59 m. What will be the head through the triangular notch when the head over rectangular notch is 0.15 m? 10

15. A town having a population of 100000 is to be supplied with water from a reservoir at 5 km distance. If one half of the daily supply of 150 liter per head should be delivered within 8 hours, what must be the size of the supply pipe, if the head available is 12 m? Take $C = 45$ in Chezy's formula. 10
16. Determine the dimension of a trapezoidal channel of the most economical section, to carry a discharge of 6 cumecs at a velocity of 1.6 m/sec. The side slopes of a channel are $\frac{1}{2}$ horizontal to 1 vertical. If Chezy's constant C is 60, what is the bed fall per km, length of the channel? 10
17. (a) An earthen channel with a base 3 m wide and side slopes 1:1 carries water with a depth of one meter. The bed slope is 1 in 1600. Taking the value of N in the Manning's formula as 0.04, calculate the discharge. 6
- (b) What is a compound pipe? How would you determine the equivalent size of a compound pipe? 4
18. Explain with neat sketch the principle of working of Pelton wheel. 10
