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C14–C–**303**

# 4227

## BOARD DIPLOMA EXAMINATION, (C–14)
## OCT/NOV—2018
## DCA—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:

    *(a)* Mass density

    *(b)* Specific weight

    *(c)* Specific gravity.

2. State the types of manometers used for measuring gauge pressures.

3. Distinguish between laminar flow and turbulent flow.

4. Define:

    *(a)* Vena-contracta

    *(b)* Co-efficient of contraction

**5.** State the formulae for discharge over (a) Sharp crested weir and (b) Broad crested weir.

**6.** Calculate the head over a rectangular notch, if the length of the notch is 1.6m and discharge is $5m^3$ / sec. Take $C_d$ 0.623.

**7.** Find the loss of head due to friction in a pipe of diameter 200 mm and length 60m, when the velocity of water in the pipe is 2.5m/sec. Use Chezy's formula. Assume C=55.

**8.** Define wetted perimeter and hydraulic mean depth.

**9.** List out the component parts of centrifugal pump.

**10.** Write any three functions of surge tank.


## PART—B                                                    10×5=50

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

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

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

**11.** The end gates of a lock are 10m height and when closed include an angle of 120°. The width of lock chamber is 6m. Each gate is supported on two hinges placed at 500 mm from top and bottom of the gate. If the water leavels are 6m and 4.2 m on the u/s and d/s respectively, determine the magnitude of the forces on the hinges due to the water pressure.

**12.** A 200 mm × 100 mm venturimeter is mounted in a vertical pipe carrying water the flow being upwards. The throat section is 300 mm above the entrance section of the venturimeter. For a certain flow through the meter the differential guage between the throat and entrance indicates a guage deflection of 300 mm assuming the coefficient of venturimeter is 0.95. Find the discharge.

**13.** A circular tank 1 m dia. with its axis vertical has a sharp edged circular orifice 50 mm dia in the base. There is no inflow. The head is lowered from 2m to 0.8m in 150 sec. Determine $C_d$. What is the rate of discharge, if the head is steady at 2m?

**14.** Water flows over a rectangular notch of 1.1m length over a depth of 0.14 m. The same quantity of water passes through a right-angled triangular notches as 0.62 and 0.59 respectively.

**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 liters per head should be delivered within 8 hours, what must be the size of the supply, if the head available is 12m? Take, C=45 in Chezy's formula.

**16.** *(a)* Water is flowing through a pipe 2.00 km long and 1.1m diameter with a velocity of 1m/sec. Find the head loss due to friction using Chezy's formula. Take C=64.

*(b)* The bed slope of a river was found to be 0.000146. If the hydraulic mean depth was 2.1 m and the velocity as determined by vertical float is 0.84m/sec, find the values of Chezy's and Bazin's constants.

**17.** A rectangular channel caries water at the rate of 400 lit/sec when bed slope is 1 in 2000. Find the most economical dimensions of the channel if Manning's constant n=0.012.

**18.** Differentiate between impulse and reaction turbines.

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