

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — OCTOBER, 2019**

HYDRAULICS

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. What is coefficient of discharge ?
2. Define compressibility.
3. What is laminar and turbulent flow ?
4. What is vena contracta ?
5. Define weirs.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. State Pascal's law.
2. Explain the experimental determination of Cv.
3. Differentiate between uniform and non-uniform flow.
4. Distinguish among atmosphere pressure, gauge pressure and absolute pressure.
5. State the use of foot valve and strainer in centrifugal pump.
6. Differentiate between sharp crested and broad crested weir.
7. Explain the effect of water hammer.

(5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

III (a) A pipe of uniform diameter 400mm carries a water at a velocity 20 m/s.

The data pertaining to two points P and Q.

Point P → Pressure intensity = 4 kg/cm² Elevation = 28m

Point Q → Pressure intensity = 3 kg/cm² Elevation = 31m

For a steady flow, find the loss of head between P and Q.

8

(b) Describe the working of Pitot tube.

7

OR

	Marks
IV (a) State and prove Bernoulli's theorem.	8
(b) Describe pressure measuring instrument.	7

UNIT — II

V (a) Explain Kaplan turbine with neat sketches.	8
(b) What is orifice ? Describe the types of orifice.	7

OR

VI (a) Explain Francis turbine.	8
(b) A head of water over an orifice of diameter 10 cm is 10 m. The water coming out from the orifice is collected in a circular tank of diameter 1.5 m. The rise of water level in this tank is 0.1 in 25 seconds. Also the coordinates of a point on the jet measured from vena contracta are 4.3 m horizontal and 0.5 m vertical. Find Cd, Cv, Cc.	7

UNIT — III

VII (a) Advantages of triangular notch over rectangular notch.	6
(b) Derive the formulae for the discharge over rectangular notches.	9

OR

VIII (a) Explain the function of surge tank, penstock and anchor block.	7
(b) Derive the formulae for the discharge over broad crested weirs.	8

UNIT — IV

IX (a) Water flows through a pipe 15 cm dia & 300m long with a velocity of 2.4 m/s. Find the head lost in friction. (i) Using Darcy's formulae (ii) using Chezy's formulae. Take the pipe as old one.	8
(b) Explain hydraulic gradient line and total energy line.	7

OR

X (a) A trapezoidal channel has side slopes 2 vertical to 3 horizontal. The discharge in the channel is 20 cumecs with a bed slope of 1 in 2000. Design the channel for its best form. Use Manning's formulae. Take $N = 0.01$	8
(b) Derive the conditions for most economical section of rectangular channels.	7