

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2018**

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. Sketch a simple manometer and mark the components.
2. What are the classifications of orifice ?
3. Distinguish between laminar flow and turbulent flow.
4. Write down the conditions for most economical rectangular channel.
5. What is meant by water hammer ?

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

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

1. A rectangular plate 2 × 3m is immersed in water in such a way that its greatest and least depths are 6m and 4m respectively from the water surface. Calculate the Total Pressure on the plate.
2. What are the minor losses occur in a pipe due to flowing of water ?
3. A jet of water issues from an orifice of diameter 20mm under a head of 1m. What is the coefficient of discharge for the orifice ? If actual discharge is 0.85lit/sec.
4. What are the advantages of a triangular notch over a rectangular notch ?
5. Explain with sketch hydraulic gradient line and total energy line.
6. A rectangular channel is 1.5 m deep and 6m wide. Find the discharge through Channel, when it runs full. Take slope of the bed as 1 in 900 and Chezy's constant as 50.
7. Describe with sketch different types of draft tubs.

(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) Explain with sketch working of Bourdon's tube pressure gauge. 8
- (b) State and prove equation of continuity of flow. 7

OR

- IV (a) Explain with sketch inverted differential manometer. 8
- (b) A venturi meter 200×100 mm fitted in vertical pipe carrying water, the flow being Upwards. The throat section is 200 mm above the entrance section of venturi meter. The differential gauge between throat and entrance shows a deflection 250mm. Assuming the venturi coefficient as 0.98, find the discharge. 7

UNIT — II

- V (a) When a sudden contraction is used in a horizontal pipe from 400mm to 200mm, the pressure change from 100 kPa. to 80 kPa. If the coefficient of contraction for the jet is 0.62, find the discharge through the pipe. 8
- (b) List out any seven comparison of centrifugal pump and reciprocating pump. 7

OR

- VI (a) A pipe of section 0.1m^2 suddenly changes to 0.4m^2 area. The quantity of water flowing in the pipe is $0.3\text{m}^3/\text{s}$ and pressure at the smaller part of pipe is 85kPa. Find head loss due to sudden enlargement and pressure at the larger end of the pipe. 8
- (b) Explain the working of a centrifugal pump. 7

UNIT — III

- VII (a) Derive an equation for discharge over a triangular notch. 8
- (b) A rectangular channel of 1.5m width is used to carry 0.2 m^3 of water. The rate of flow is measured by placing a 90° notch. If the maximum depth of water is not to exceed 1.2m. Find the position of the apex of the notch from the bed of the channel. Assume $C_d = 0.6$. 7

OR