

Register
Number

--	--	--	--	--	--	--

III Semester Diploma Examination, Nov./Dec. 2013

FLUID MECHANICS AND MACHINERY

Time : 3 Hours]

[Max. Marks : 100

Note : (i) Section – I is compulsory.

- (ii) Answer two full questions from each Section III & IV.
(iii) Assume missing data if any, suitably.

SECTION – I

(a) Fill in the blanks with appropriate word/s :

- (i) Draft tubes are used in _____ turbines.
(ii) Manometer is used to measure _____.
(iii) The difference between Theoretical discharge and Actual discharge in Reciprocating pump is called _____.
(iv) The property of liquid which enables it to resist tensile stress is _____.
(v) Bulk modulus is the reciprocal of _____.
(b) Differentiate between slip and negative slip.

5 × 1 = 5

SECTION – II

- (a) State Bernoulli's equation and list the assumptions made. 5
(b) Explain capillarity with neat sketch. 5
(c) Find the loss of head due to friction in a pipe of 500 mm diameter, 1.5 k.m. long the velocity of water in the pipe of one metre per second. Take $f = 0.005$. 5
(a) Explain with a neat sketch pitot tube. 5
(b) Explain buoyancy and metacentre. 5
(c) Water is flowing through a pipe 1500 metre long with a velocity of 0.8 metre per second. What should be the diameter of pipe if loss at head due to friction is 8.7 metre. Take $f = 0.01$. 5

[Turn over

4. (a) Briefly explain flow nozzle.

(b) Sketch and explain flow through siphon.

(c) A pipe line 250 metre long and 75 mm diameter as a nozzle fitted at the discharge and find the diameter of the nozzle so that minimum power is transmitted. Take $f = 0.01$.

SECTION - III

5. (a) Explain force of jet impinging on a moving plate.
(b) A jet of 100 mm diameter moving with a velocity of 12 metres per second impinges on a series of vanes moving with a velocity of 8 metre per second. Determine

(i) Force exerted

(ii) Work done

(iii) Efficiency

6. (a) Explain with neat sketch Pelton wheel turbine.

(b) A Pelton wheel working under a head of 620 metre has co-efficient of velocity 0.97, hydraulic efficiency 0.85%. Find the suitable size of the wheel. Taking speed as 500 rpm, assume $u = 0.46V$.

7. (a) Differentiate between impulse and reaction turbine.

(b) Explain surge tank with a sketch.

(c) Write a note on anchor block.

SECTION - IV

8. (a) Explain with a neat sketch, types of casing of centrifugal pump.

(b) A centrifugal pump is to lift water to a total head at 40 metre at the rate of 50 litres per second. Find the power required by the pump if its overall efficiency is 62%.

(c) Explain priming of centrifugal pump.

3

Differentiate between centrifugal pump and reciprocating pump.

What is a submersible pump ? Mention its uses.

Write note on cavitation in pumps.

Explain with a neat sketch double acting reciprocating pump.

What is an air vessel ? Where it is used ?

A single acting reciprocating pump having a bore of 150 mm diameter and stroke of 300 mm length discharges 200 litres of water per minute at 40 rpm neglecting losses. Find

- (i) Theoretical discharge in litres per minute
- (ii) Co-efficient of discharge
- (iii) Percentage slip of pump

www.QuestionsPaper.in