

## III SEMESTER DIPLOMA EXAMINATION IN ELECTRICAL &amp; ELECTRONICS ENGG

**MECHANICAL ENGINEERING**

max.marks :100

Time :3hrs

**PART A**

I.

(Answer in one or two sentences. Each questions carry 2 marks each)

- 1) Mention the limitations of piezometer.
- 2) State Bernoullis theorem
- 3) Classify steam turbines
- 4) Kaplan turbine in an axial flow reaction turbine. Justify.
- 5) Define critical velocity

5x2=10

**PART B**

II.

(Answer any five questions, each carry 6 marks each)

- 1) Determine the gauge and absolute pressure at a point 3m below the free surface of water . Take atmosphere pressure as 760 mm of Hg.
- 2) A circular plate 2m in diameter is held vertically in water such that the centre of plate is 1.5 m below the free surface of water. Find the total pressure acting on the plate.
- 3) Distinguish between laminar and turbulent flow. Mention the significance of Reynolds number on it.
- 4) Determine the loss of head due to sudden contraction of a pipe line from 20cm to 10 cm diameter. The discharge of water through the pipe line being 15000 Lit/minute.
- 5) Compare fire tube and water tube boiler
- 6) Explain specific speed. How does it help in the selection of turbine.
- 7) Draw a neat sketch of reciprocating pump and explain its working.

5x6=30

(Answer any full question from each unit. full question carry 15 marks.)

MODULE I

III.

1) A simple U tube manometer containing mercury is connected to pipe in which a fluid of sp.gravity 0.8 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in the pipe, if the difference of mercury level in two limbs is 40cm and the height of fluid in the left limb from the centre of pipe is 15 cm below (8)

2) A rectangular plane surface 1.5 m wide and 2m deep lies in water in such a way that its plane makes an angle of 30 degree with the free surface of water. Determine the total pressure acting on the plate, when the upper edge is 1m below the water surface. (7)

OR

IV.

1) Explain different types of fluid flow (6)

2) Two points in a horizontal pipeline are connected by a U tube differential manometer. Oil having specific gravity of 0.8 flows through the pipeline and mercury is used as the gauge liquid. If the difference of mercury level in the two limbs is 300mm, determine the difference of pressure between the two points in (i) meters of water (ii) in kPa. (9)

V

UNIT II

1) Explain the constructional details of venturimeter with a neat sketch . (7)

2) Find the head loss due to friction in a pipe of diameter 200mm and length 10m, through which water is flowing at a velocity of 3m/s using (i) Darcy's formula (ii) Chezy's formula. Take  $f = 0.009$  and  $C = 50$ . (8)

OR

VI

1) Illustrate syphon pipe, and its working. (6)

2) Determine the flow rate of oil having sp.gravity 0.8, through a venturimeter 200mmX100mm. The reading of oil mercury differential manometer is 25 cm. Take  $c_d = 0.98$  (9)

UNIT III

VII.

1) list out the advantages of steam turbine over steam engine. (7)

2) Explain the working of water tube boiler with neat sketch. (8)

OR

VIII

- 1) Explain the working principle of reaction steam turbine. Compare reaction steam turbine and impulse steam turbine. (7)
- 2) Explain the working of De-level impulse turbine with neat sketch (8)

UNIT IV

IX

- 1) Classify water turbine (6)
- 2) Explain the working of centrifugal pump with neat sketch (9)

OR

X

- 1) Describe the working of air vessel (6)
  - 2) Explain the working of Francis turbine with neat sketch (9)
- 

MADIN Polytechnic College