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Reg. No. ....

(REVISION — 2015)

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

**MECHANICAL ENGINEERING**

[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. Define Uniform flow and Steady flow.
2. Identify the principle used behind the tube manometers.
3. Write down the usage of venturimeter in pipe flow and also list out its parts.
4. Write down any two classifications of steam turbines.
5. Write down the functions of draft tube used in reaction turbine.

(5×2 = 10)

**PART — B**

(Maximum marks : 30)

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

1. A peizometer connected to a pipe running full with water shows the rise of water level from the surface of the pipe as 100 cm. Determine the pressure inside the pipe.
2. Determine the total head of water in metres flowing with a velocity of 8 metres per second under a pressure of 80 kPa. The central line of the pipe is 5m above the datum line.
3. A pipe of sectional area 0.1 m<sup>2</sup> is suddenly enlarged to sectional area of 0.6 m<sup>2</sup>. Calculate the head loss due to this enlargement, if the quantity of water flowing through the pipe is 700 litres per second.
4. Compare the fire tube and water tube boilers.
5. Compare petrol and diesel engines.
6. Illustrate the working of the reciprocating pump.
7. Determine the specific speed and type of the turbine developing 625 kW under a head of 20 metres and at 150 rpm.

(5×6 = 30)

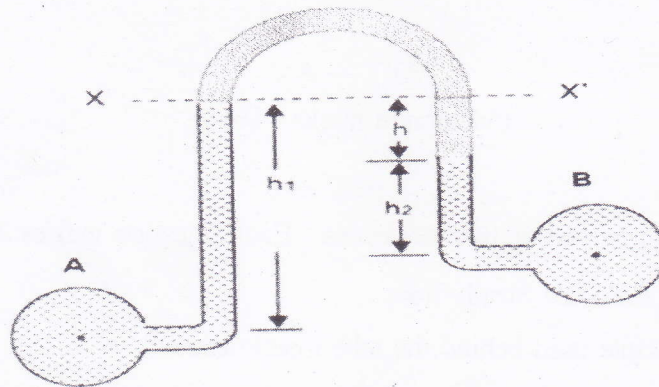
## PART — C

(Maximum marks : 60)

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

## UNIT — I

- III (a) Explain the working of a simple U tube manometer with a neat sketch. 7
- (b) Calculate the pressure difference in between the two pipes A and B containing water, if the manometer connected to the two pipes with a manometric liquid as oil of specific gravity 0.8 showed the reading as in the figure.



$$h_1 = 1.65 \text{ m}, h = 0.25 \text{ m}, h_2 = 0.5 \text{ m}$$

8

OR

- IV (a) The gauge pressure in a pipe is found to be 30 cm of mercury and the atmospheric pressure is 10.3 m of water. Calculate the Absolute pressure inside the pipe in kPa. 7
- (b) Explain the working of a inverted U tube differential manometer with a neat sketch. 8

## UNIT — II

- V (a) A horizontal pipe 100m long uniformly tapers from 300 mm diameter to 250 mm diameter. Calculate the pressure end at the smaller end, if the pressure at the larger end is 100 kPa and the pipe is discharging 650 litres of water. 7
- (b) In a lab experiment, it had been recorded that discharge of water in a pipe connected with a 100 mm × 60 mm venturimeter was 25.5 litres of water per second. The U tube differential manometer connected to the venturimeter with mercury as manometric liquid showed a level difference of 300 mm. Calculate the Coefficient of discharge of the venturimeter. 8

OR



		Marks
VI	(a) Explain the phenomenon water hammer and its harmful effects.	6
	(b) Calculate the loss of head, due to friction, in a pipe of 600 mm diameter and 2 kilometres long in which water is flowing with a velocity of 2 metres per second. Darcy's constant $f$ is given as 0.005.	9

## UNIT — III

VII	(a) Mention the advantages of steam turbines over steam engines.	7
	(b) Explain the working of a four stroke diesel engine with a neat sketch.	8

OR

VIII	(a) Compare between Impulse steam turbine and Reaction steam turbine.	7
	(b) Compare between two stroke and four stroke cycle engines.	8

## UNIT — IV

IX	(a) Compare Centrifugal and Reciprocating pumps.	7
	(b) Explain the working of Pelton Wheel with a neat sketch.	8

OR

X	(a) Explain the working of a Modern Francis turbine with a neat sketch.	8
	(b) Describe about the main parts of a Centrifugal pump.	7

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