

TED (15) – 3034

Reg. No.....

(REVISION — 2015)

Signature

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

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. Express atmospheric pressure in meters of water.
2. What is the reason for minor losses in pipe flow ?
3. Define the term “coefficient of discharge” of a venturimeter.
4. Write one example each for fire tube and water tube boilers.
5. What is the function of a foot valve ?

(5×2 = 10)

PART — B

(Maximum marks : 30)

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

1. A pressure gauge fitted to the delivery pipe of a centrifugal pump reads 70 kPa. Find the absolute pressure of water pumped in kPa assuming atmospheric pressure as 10.3 m of water.
2. Explain about the following type of fluid flows (i) steady & unsteady flow (ii) Uniform & Non uniform flow (iii) Laminar & Turbulent flow.
3. With the help of a neat diagram, explain the process of discharge measurement using venturimeter.
4. State Bernoulli's theorem and express it in the form of an equation.
5. What are the draw backs of two stroke engines ?
6. What are the advantages of a steam turbine compared to steam engine ?
7. Explain about the working of airlift pump.

(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 simple manometer containing mercury is used to determine the pressure of oil of specific gravity 0.8 flowing in a pipe. Its right limb is open to atmosphere and left limb is connected to the pipe. The centre of the pipe is 90 mm below the level of mercury in the right limb. If the difference of mercury level in the two limbs is 150 mm, find the pressure of oil in the pipe.

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- (b) With neat diagrams, explain about the following devices: (i) Piezometer (ii) Simple U-tube manometer (iii) Differential U-tube Manometer.

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OR

- IV (a) A differential mercury manometer is used to measure the difference of pressure of oil of specific gravity 0.8 contained in two pipes at the same level. If the deflection of the manometric liquid is 100 mm, determine the difference of pressure of oil in the two pipes in kPa.

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- (b) An oil of specific gravity 0.8 is under a pressure of 140 kN/m^2 . What is the pressure head expressed in meters of water and meters of oil ?

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UNIT — II

- V (a) A horizontal venturimeter has inlet and throat diameters of 150 mm and 75 mm respectively. The Kerosine of specific gravity 0.8 is flowing through the pipe. The differential manometer connected to the inlet and throat of the meter reads a difference of mercury level of 85 mm. If $C_d = 0.98$, find the discharge.

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- (b) Water flows through a pipe of diameter 350 mm in diameter and 75 m long at the rate of 270 litres per second. Find the head lost due to friction using (i) Darcy's formula when $f = 0.0026$ and (ii) Chezy's formula when $C = 55$.

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OR

- VI (a) Explain about water hammer in pipes.
- (b) A pipe of 250 mm diameter is suddenly reduced to 150 mm diameter. If the discharge of water through the pipe is 25 litres/second, calculate the head loss due to sudden contraction.

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UNIT — III

- VII (a) With neat diagrams, explain the working of a four stroke Diesel engine.
- (b) With a neat diagram, explain the working of an impulse-reaction steam turbine.

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OR

- VIII (a) What are the differences between a Petrol engine and a Diesel engine ?
- (b) With the help of a diagram, explain the different parts of an internal combustion engine.

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UNIT — IV

- IX (a) Explain in detail about manometric head and manometric efficiency of a centrifugal pump.
- (b) Explain about selection of hydraulic turbines based on head and specific speed.

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OR

- X (a) With a neat diagram, explain the working of Pelton turbine.
- (b) Write the differences between centrifugal pump and reciprocating pump.

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