



C-09-M-405

3505

BOARD DIPLOMA EXAMINATION, (C-09)

MARCH / APRIL - 2019

DME - IV SEMESTER EXAMINATION

THERMAL ENGINEERING - II

Time : 3 Hours]

[Total Marks : 80

PART - A

3×10=30

- Instructions :**
- (1) Answer **ALL** questions.
 - (2) Each question carries **THREE** marks.
 - (3) Answer should be brief and straight to the point.

- 1 Differentiate air cooling from water cooling system.
- 2 Define 'Top Dead Centre' and 'Bottom Dead Centre'.
- 3 Write any three differences between axial flow and radial flow compressors.
- 4 Write the applications of gas turbines.
- 5 Write the functions of front axle of an automobile.
- 6 How do you classify Boiler Draught ?
- 7 List any six mountings of a steam boiler.
- 8 A steam nozzle is supplied with steam having an initial velocity of 50m/s. the initial and exit enthalpies are $H_1 = 3000kJ/kg$ and $H_2 = 2600 kJ/kg$. Neglecting friction, find the exit velocity of steam.
- 9 What do you mean by compounding of steam turbines?
- 10 Write the working principle of a reaction turbine.

PART - B**10×5=50**

- Instructions :**
- (1) Answer any **FIVE** questions.
 - (2) Each question carries **TEN** marks.
 - (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11 An engine working on Otto cycle has compression ratio of 8. It uses petrol having a calorific value of 44000kJ/kg . If the brake thermal efficiency of the engine is 60% of the air standard efficiency, determine the specific fuel consumption in kg/kWh . Take $\gamma = 1.4$ for air.
- 12 Determine the cylinder dimensions of a 8 kW air compressor, which compresses air from 1 bar pressure to 7 bar according to the law $pV^{1.2} = \text{Const}$. Average piston speed is 160m/min. Assume stroke to diameter ratio. is 1.5 : 1 and neglect clearance volume.
- 13 (a) Explain the working of Rocket propulsion unit with a neat sketch.
(b) Explain the working of Ramjet engine with a neat sketch.
- 14 Discuss in detail the constructional features of clutch components.
- 15 Explain the working principle of a La-Mont boiler with a neat sketch.
- 16 A convergent divergent nozzle for a steam turbine has to deliver 320kg of steam per hour under a supply condition of 10bar, dry and saturated and a back pressure of 0.15bar. Initial velocity of steam is 140m/s . Neglecting friction, find throat and outlet areas.
- 17 (a) Write the classification of Steam Turbines.
(b) Describe the principle of operation of a reaction turbine.
- 18 (a) Explain quality governing method of an IC engine.
(b) Derive an expression for work done and power developed by an Impulse turbine.