No. of Printed Pages : 2

BME-052

DIPLOMA IN MECHANICAL ENGINEERING (DME) / ADVANCED LEVEL CERTIFICATE COURSE IN MECHANICAL ENGINEERING (DMEVI / ACMEVI)

Term-End Examination

00610

June, 2016

BME-052 : BASICS OF THERMAL ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Answer any **seven** questions. All questions carry equal marks. Use of scientific calculator, Steam tables, Mollier diagram are permitted. Assume missing data, if any.*

1. Explain Kelvin-Planck Statement of Second Law of Thermodynamics. What do you understand by System, Surroundings and Boundary ? Explain with diagram. *10*

2. A piston cylinder device containing a gas has a piston mass of 60 kg and a cross-sectional area of 0·04 m^2. The local atmospheric pressure is 0·97 bar.

(i) Determine the pressure inside the cylinder.

(ii) If some heat is transferred to the gas and its volume doubles, do you expect the pressure inside the cylinder to change ? *10*

3. Derive an expression of thermal efficiency for Carnot cycle showing all the processes on p-V diagram. *10*

4. A rigid tank contains 10 kg of water at 90°C. If 8 kg of water is in the liquid form and the rest in the vapour form, determine

(i) the pressure in the tank, and

(ii) the volume of the tank. *10*

5. Explain the working principle of Babcock and Wilcox Boiler with neat diagram. *10*

6. Explain the working of Bourdon type pressure gauge with a neat diagram. *10*

7. What are the different types of compounding of Impulse Turbine ? Explain one of them with a neat diagram. *10*

8. Discuss the working principle of a Barometric Condenser with a diagram. *10*

9. Define and explain Conduction, Convection and Radiation in detail. *10*

10. What is wind energy ? Discuss the working of wind energy conversion system with a diagram. *10*
