

**DIPLOMA IN MECHANICAL ENGINEERING
(DME)**

Term-End Examination

June, 2013

BME-053 : APPLIED THERMAL ENGINEERING

Time : 3 hours

Maximum Marks : 70

*Note : Answer **any ten** questions. All questions carry equal marks. Use of scientific calculator is **permitted**.*

1. What is cut off ratio ? How does it affect the air standard efficiency of a Diesel cycle ? 7
2. Calculate the thermal efficiency of an engine working on the Otto cycle. The bore and stroke of the cylinder are 17 cm and 30 cm respectively. The clearance volume is $20-25 \text{ cm}^3$. 7
3. How does a two - stroke engine differ from a four stroke engine ? 7
4. Define calorific value of fuel. Differentiate between higher calorific value and lower calorific value of fuel. 7
5. Describe in brief the types of electronic ignition system of SI engine with the help of neat diagram. 7
6. Describe water cooling system in IC engines with the help of neat diagrams 7

7. Explain important parts of Lubrication system of I.C engine. Also describe the purpose of oil filters. 7
8. Explain the effect of clearance on volumetric efficiency of reciprocating air compressor. 7
9. An air compressor is required to compress air from a pressure of 1 bar to 10 bar. Calculate the amount of work required per kg of air, when $n=1.2$ for compression. 7
Assume initial temperature as 15°C and R for air is 0.287 kJ/kg. K .
10. What are the methods for improving the performance of a simple gas turbine plant ? Explain them briefly. 7
11. State the purpose of the following parts of an IC engine : 7
- (i) Spark plug
 - (ii) Piston rings
 - (iii) Crank and crank shaft
 - (iv) Crank shaft
 - (v) Valve mechanism
 - (vi) Fly wheel
 - (vii) Piston.
12. Differentiate between open cycle and closed cycle gas turbine. Also explain the application of Gas Turbine. 7