No. of Printed Pages : 3

BME-053

DIPLOMA IN MECHANICAL ENGINEERING (DME)

Term-End Examination

00421

June, 2015

BME-053 : APPLIED THERMAL ENGINEERING

Time : 2 hours *Maximum Marks : 70*

Note : *Answer any* ***five*** *questions. Use of scientific calculator is allowed. Assume any missing data suitably.*

1. (a) Draw the thermodynamic cycle of a gas turbine plant on T-S or P-V diagram. Explain its processes. *6*

(b) An engine working on Otto cycle is supplied with air at 0·1 MPa, and 35°C. The compression ratio is 8. Heat supplied is 2100 kJ/kg. Calculate

(i) the maximum pressure and temperature of the cycle,

(ii) the cycle efficiency, and

(iii) the mean effective pressure.

(Given C_p = 1·005 kJ/kg-K and C_v = 0·718 kJ/kg-K) *8*

2. (a) Explain the working of a 2-stroke petrol engine with the help of a suitable sketch. 7

(b) What do you mean by governing of petrol engine ? Describe the various methods of governing in brief. 7

3. (a) List the various tests which are conducted to ascertain the burning properties of coal. Describe any one of them. 7

(b) Describe the various characteristics of petroleum. How are petroleums classified ? 7

4. (a) Give comparison of battery ignition and magneto ignition systems. 7

(b) Describe transistorized assisted contact ignition system with the help of a suitable sketch. 7

5. (a) Explain the functions of the following components of engine cooling system : 7

(i) Radiator

(ii) Pump

(b) Differentiate between air cooling system and water cooling system of IC engines. 7

6. (a) Describe the working of a wet sump lubrication system with the help of a suitable sketch. 7

(b) What do you mean by crank case ventilation ? Why is it necessary and how is it done ? 7

7. (a) What is meant by friction horse power ? List the different methods of measurement of friction horse power. *4*

(b) Find the cylinder diameter and stroke length of a 2-stroke, 2-cylinder I.C engine having the following data : *10*

Engine speed = 4000 rpm

Volumetric efficiency = 0·77

Mechanical efficiency = 0·75

Fuel consumption = 10 litres/hour

Specific gravity of fuel = 0·73

Air fuel ratio = 18 : 1

Piston speed = 600 m/min

Indicated m.e.p. = 5 bar

Given : R for gas mixture at

S.T.P. = 281 J/kg-K.

Also find the brake power.

8. Write short notes on the following : $4 \times 3\frac{1}{2} = 14$

(a) Morse Test

(b) Blast Furnace Gas

(c) Ignition Advance

(d) Gas Chromatography
