Printed Pages : 3

EME-505

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 140505

Roll No.

B. Tech.

(SEM. V) (ODD SEM.) THEORY EXAMINATION, 2014-15

IC ENGINES & COMPRESSORS

Time : 2 Hours] [Total Marks : 50

Note : All questions carry equal marks.

1 Attempt any four parts :

a) Compare Otto, Diesel and Dual cycles for the

I. same compression ratio and heat input

II. same maximum pressure and temperature

b) Discuss the use of LPG as SI Engine fuel.

c) Discuss variables effecting the delay period.

d) Write short notes on diesel knock and its control.

e) Sketch and explain working principle of a typical thermostat used in engine cooling system.

f) Write short notes on Surging and stalling.

2 Attempt any two parts :

a) Following data relates to 4 cylinders, 2 stroke petrol engine. Air/Fuel ratio by weight 16:1. Calorific value of the fuel = 45200 kJ/kg, Mechanical efficiency = 82%. Air standard efficiency = 52%, Relative efficiency =70%, Volumetric efficiency = 78%, Stroke/bore ratio = 1.25, Suction conditions = 1 bar, 25°C Speed = 2400 rpm, Power at brakes of 72 kW. Calculate

I. Compression ratio.

II. Brake specific fuel consumption

III. Bore and stroke.

b) A single cylinder four stroke diesel engine working on dual combustion cycle has a compression ratio of 15:1. The engine draws in air at 1bar, 27°C and the maximum pressure in the cylinder is limited to 55 bar. If the heat transfer at constant volume is twice that at constant pressure, determine

I. Constant volume pressure ratio

II. Cut off ratio

III. Thermal efficiency of the cycle.

Assume C_p=1.005 k J/kg.K, C_v = 0.718 k J/kg.K and γ = 1.4.

c) Discuss the important qualities of an SI and CI engine fuel.

d) Explain the construction and working of a root blower and axial flow compressor with a neat sketch.

3 Attempt any two parts :

a) Discuss the general principles of SI engine combustion chamber design.

b) Explain why simple carburetor cannot meet the various engine requirements.

c) List various Electronic ignition systems in use. Describe any one of them clearly stating its advantages over the conventional ignition system.

d) Briefly explain the various methods of supercharging an engine.

4 Attempt any two parts :

a) Sketch some important designs of open combustion chamber for CI engines.

b) How are the injection system classified ? Describe them briefly. Why the air injection system is not used nowadays ?

c) Explain the stages of combustion in a CI Engine

d) What is meant by Crankcase ventilation ? Explain the details.