



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

PAPER ID : 140505

Roll No.

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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 $C_p = 1.005 \text{ k J/kg.K}$, $C_v = 0.718 \text{ k J/kg.K}$ and $\gamma = 1.4$.
- 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.