

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

**PAPER ID : 2106**

Roll No.

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**B. Tech.**

(SEM. V) ODD SEMESTER THEORY EXAMINATION 2013-14

**IC ENGINES AND COMPRESSORS**

Time : 2 Hours

Total Marks : 50

**Note :** Attempt **ALL** the questions.

1. Attempt any **two** questions :— **(7×2=14)**
- (a) Explain the difference between two stroke and four stroke engines. Draw the actual valve timing diagram for a 4 stroke and 2 stroke S.I. Engine.
- (b) Discuss the effects of gasoline volatility on cold starting, hot starting, warm up and vapour lock. What is performance number and diesel index ?
- (c) Following data was obtained during the trial of two cylinders, 2 stroke engine :
- Bore 10 cm, stroke 14 cm, speed 1500 rpm, Area of the positive and negative loop are 6 cm<sup>2</sup> and 0.25 cm<sup>2</sup> respectively. Length of indicator diagram is 6 cm, spring constant of indicator is 3.8 bar/cm, Net brake load on the dynamometer is 237.5 N, Brake drum radius is 0.4 m, Fuel consumption is 4.7 kg/hr, calorific value of fuel 45000 kJ/kg. Find indicated power, brake power, mechanical and thermal efficiencies.
2. Attempt any **two** questions :— **(6×2=12)**
- (a) Explain the stages of combustion in S.I. Engine. Explain the terms flame speed and ignition delay.

- (b) Discuss the effect of following engine variables on S.I. engine performance :
- (i) Compression ratio
  - (ii) Ambient pressure and temperature
  - (iii) Air-fuel ratio
  - (iv) Turbulence.
- (c) Explain the construction and working of simple carburettor in a S.I. engine. Explain the carburetion by compensating jet method with sketch.
3. Attempt any *two* questions :— (6×2=12)
- (a) What is ignition delay in case of C.I. engines ? Discuss the variables affecting ignition delay.
  - (b) Explain the types of fuel injection systems in diesel engine.
  - (c) What are the types of combustion chamber used in C.I. engines ?
4. Attempt any *two* questions :— (6×2=12)
- (a) Differentiate between centrifugal compressor and axial flow compressor.
  - (b) Show advantages of multistage compression with help of PV and TS diagram. Derive optimum pressure ratio for 2 stage minimum work of compression.
  - (c) Write short notes on any *two* :
    - (i) Roots blower
    - (ii) Supercharging
    - (iii) Surging and choking.
    - (iv) Radiator.