

Printed Pages: 3

NME-505

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

Paper ID : 2012258

Roll No.

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**B.TECH.****Regular Theory Examination (Odd Sem - V), 2016-17****I.C. Engines & Compressors****Time : 3 Hours****Max. Marks : 100****Section - A****Note: Attempt all parts. All parts carry equal marks.****Write answer of each part in short. (10×2=20)**

- 1
- Define compression Ratio.
  - Compare SI and CI Engine with respect to Compression ratio & Ignition.
  - Why a rich mixture is required for maximum power?
  - What is supercharging in a IC engine?
  - Define ignition delay.
  - What is the cause for diesel smoke?
  - List the use of LPG as SI Engine fuel.
  - What is the significance of flash and fire points of a lubricant?
  - Differentiate between single stage and multi stage air compressor.
  - Define volumetric efficiency.

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## Section - B

**Note: Attempt any five questions from this section**

**(5×10=50)**

2. An amount of a perfect gas has initial condition of volume  $1\text{ m}^3$ , pressure 1 bar and temperature  $18^\circ\text{C}$ . It undergoes ideal diesel cycle operation, the pressure after isentropic compression being 50 bar and the volume after constant pressure expansion being  $0.1\text{ m}^3$ . Calculate the temperature at the major point of the cycle and evaluate the thermal efficiency of diesel cycle.
3. Briefly explain with a neat sketch the operation of a simple float type carburetor.
4. Describe high tension magneto ignition system with a neat sketch.
5. Explain the stages of combustion in a CI Engine.
6. How are the injection system classified? Describe them briefly.
7. A six cylinder, 4 stroke SI engine having a piston displacement of  $700\text{ cm}^3$  per cylinder developed 78 kW at 3200 rpm and consumed 27 kg of petrol per hour. The calorific value of petrol is 44 MJ/kg. Estimate
  - a) Volumetric efficiency of the engine if the air fuel ratio is 12 and intake air is at 0.9 bar,  $32^\circ\text{C}$ .
  - b) Brake thermal efficiency and
  - c) Braking torque.

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8. A single stage single acting reciprocating air compressor has a bore of 200 mm and a stroke of 300 mm. It receives air at 1 bar and 20°C delivered it at 5.5 bar. If the compression follows the  $p v^{1.3} = C$  and clearance volume is 5% of stroke volume, determine :
- a) Mean effective pressure,
  - b) Power to drive the compressor, if it runs at 500 rpm.
9. Describe with a neat sketch the working principle of vane blower.

**Section - C**

**Note: Attempt any two questions from this section**

**(2×15=30)**

10. a) Explain the significance of fuel air cycle. **(5)**  
b) Compare the following :  
i) Two stroke and four stroke engine.  
ii) Otto, diesel & dual cycle. **(10)**
11. a) Explain the stages of combustion in SI Engine. **(7)**  
b) Sketch some important designs of open combustion chamber for CI engines. **(8)**
12. Discuss Engine cooling and lubrication systems in detail with required sketches. **(20)**



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