



Printed Pages : 4

TME - 602

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

PAPER ID : 4094

Roll No.

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B. Tech.

(SEM. VI) EXAMINATION, 2008-09

I C ENGINES

Time : 3 Hours]

[Total Marks : 100

- Note :**
- (1) Attempt **all** the questions.
 - (2) All questions carry **equal** marks.
 - (3) If any data missing, assume suitably.

1 Attempt any **two** parts of the following: 10x2

- (a) Differentiate between a Otto cycle and diesel cycle.

An engine works on air standard diesel cycle whose compression ratio is 14. The pressure and temperature at the beginning of the cycle are 1 bar and 300° K respectively. The maximum temperature of the cycle is limited to 2500°C. Determine the thermal efficiency and mean effective pressure of the cycle.

- (b) What are the main differences between two stroke and four stroke engines ? List the various



merits and demerits of two stroke over four stroke. Explain the working of four stroke cycle diesel engine.

(c) Write notes on:

- (i) Rating of SI engine fuels
- (ii) Alternative fuels for I.C. Engines.

2 Attempt any **two** part of the following: **10x2**

- (a) What are the disadvantages of carburettors? Describe a MPFI System used for multicylinder engines.
- (b) What design considerations are made for a combustion chamber for SI engines? Describe with a neat sketch a F. head. Combustion Chamber.
- (c) Describe with a neat sketch, the battery ignition system. What are the factors which affect the voltage generated at the spark point?

3 Attempt any **four** parts of the following: **5x4**

- (a) What are the requirements of an ideal injection system? Describe a solid injection system.
- (b) Derive an equation of mass flow of fuel through a nozzle of single orifice.
- (c) What are the effects of injection timing and rate of fuel injection on the diesel knock?



- (d) Define Squish, Swirl and Turbulance. Explain their importance in the design of C.I. engine combustion chamber.
- (e) What do you understand by Scavenging? Explain the scavenging process in two stroke engines.
- (f) Explain the role of 'Afler Burner' in pollution control.

4 Attempt any **four** parts of the following:

5x4

- (a) Describe a thermostatic cooling system. Discuss the merits and demerits of water cooling with air cooling system.
- (b) With a neat sketch describe a type of radiator. Discuss the importance of fan in a radiator.
- (c) Differentiate between dry and wet sump lubrication, where dry sump lubrication is preferred and why?
- (d) What do you understand by Crank Case Ventilation? Discuss the types of Crank Case Ventilation.
- (e) Discuss the effect of super charging on the following parameters:
 - (i) Power output
 - (ii) Mechanical efficiency
- (f) Describe the method of measurement of brake power with rope brake with suitable diagram.



5 Attempt any **two** part of the following 10x2

- (a) The free air delivery of a single cylinder single stage reciprocating air compressor is $2.5 \text{ m}^3/\text{min}$. The ambient air is at STP conditions and delivery pressure is 7 bars. The clearance volume is 5% of the stroke volume and law of compression and expansion is $p v^{1.25} = C$. If $L = 1.2 D$ and the compressor runs at 150 RPM, determine the size of the cylinder.
- (b) Explain the phenomena of surging and choking in Centrifugal Compressors. Give the advantages and limitations of reciprocating compressors over rotary compressors.
- (c) Write notes on :
- (i) volumetric efficiency of a reciprocating compressor
 - (ii) Inter cooler.

