Roll No .....

MMTP - 105

M.E./M.Tech. I Semester

Examination, June 2013

I.C. Engines and Alternate Fuels

Time : Three Hours

Maximum Marks : 70

Note: *Attempt any five questions.*
All questions carries equal marks.

1. Explain with construction and working of MPFI system with neat sketch. Also explain the term "rating of gasoline engine".

2. a) Explain various types of pollutants emitted from SI engine.

   b) Explain performance maps in detail with neat sketch.

3. In a test on single cylinder four stoke cycle gas engine with explosion in every cycle, the gas consumption given by the meter was 0.216 m^3/min, the pressure and temperature of the gas being 75mm of water and 17°C respectively. Air consumption was 2.84 kg/min, the temperature being 17°C and barometer reading 745 mm of mercury. The bore of the engine was 250 mm and stroke 475mm and rpm 240. Find volumetric efficiency of the engine referred to volume of change at NTP. Assume R for air $287 \frac{Nm}{Kg\,K}$.

4. a) Why substitute new fuel in IC engines?

   b) What are the merits over the conventional fuels?

   c) What kinds of drawbacks may possible with new fuels?

   d) What kinds of transportation may possible with new fuels?

5. a) Describe what occurs when a SI engine Knocks.

   b) With a Knock sensor the normal knock strategy is related the spark timing when knock is detected until knock no longer occurs. Explain why this strategy is effective.

   c) In a knocking engine, the crank ample at which auto ignition occurs and the magnitude of the pressure oscillations which result vary substantially, cycle-by-cycle. Suggest reasons why this happens.

6. Write about the following points associated to automotive engines.

   a) Remedial measurements

   b) Rotary engine

   c) Storing of substitute fuels

7. a) Differentiate between the pumping losses and friction losses in IC engine.

   b) Differentiate between normal and abnormal detonation in engine.

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