 Roll No .....

MMTP - 105

M.E./M.Tech., I Semester

Examination, June 2014

IC Engines and Alternate Fuels

Time : Three Hours

Maximum Marks : 70

Note : Attempt any five questions. All questions carry equal marks.

1. a) What is the significance of the ASTM distillation curve? Explain in brief.

   b) Explain the difference between the continuous injection and intermittent or pulsed injection.

2. a) What is generalized performance map of IC engines? What is its advantage over conventional performance curves?

   b) A four cylinder four stroke SI engine has a compression ratio of 8 and bore of 100 mm, with the stroke equal to the bore. The volumetric efficiency of each cylinder is equal to 75%. The engine operates at a speed of 4800 rpm with an air fuel ratio 15.

   Given that the calorific value of fuel = 42 MJ/kg, atmosphere density = 1.12 kg/m^3, mean effective pressure in the cylinder = 10 bar and mechanical efficiency of the engine = 80%, determine the indicated thermal efficiency and the brake power.

3. a) What is dual fuel engine? Explain in brief.

   b) Describe with suitable sketch the working principle of wankel rotary combustion engine.

4. a) Explain alcohols as alternate fuels for IC engines bringing out their merits and demerits.

   b) What is transesterification? Explain the process in brief.

5. a) Explain the phenomenon of auto ignition. Explain how auto ignition is responsible for knocking in S.I. engine.

   b) Explain the principle of carburetion in brief.

6. a) What is meant by supercharging? What is its effect on engine performance?

   b) What are the emissions that come out of engine exhaust?

7. a) What is stratified charge engine? What are the various methods of charge stratification?

   b) What are the advantages and disadvantages of using LPG as an alternate fuel for S.I. engines?

8. Write short note on (any three)

   i) Multi fuel engines

   ii) Hydrogen as an alternate fuel

   iii) HCCI engine

   iv) Storage of substitute fuels

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