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Roll No

MMTP-105**M.E./M.Tech. I Semester**

Examination, June 2017

IC Engines & Alternative Fuels*Time : Three Hours**Maximum Marks : 70*

- Note:** i) Attempt any Five questions.
 ii) All questions carry equal marks.
 iii) Assume suitable data if missing.

1. a) Explain various combustion stages in pressure angle diagram with neat sketch.
 b) How higher engine speeds affect IMEP?
2. a) Discuss different methods of supercharging used in practice.
 b) Discuss various elements of MPFI system and also write its merits and demerits.
3. a) What are major difficulties to be faced if a single jet carburetor is used?
 b) A 4 cylinder, four stroke engine has diameter = 10cm and stroke = 12cm. The diameter of a venture of a carburetor is 3cm. Determine the head required to cause the flow of air. Take volumetric efficiency = 0.7, $C_{da} = 0.8$, density of air = 1.29 kg/m³.

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4. a) Describe the working of dual fuel engine with neat sketch and discuss its performance characteristics.
 b) Discuss the performance characteristics of variable compression ratio engine with conventional IC engine.

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5. a) Describe working of rotary Wankel engine with help of neat sketch.
 b) Differentiate normal and abnormal combustion.
6. a) What are the causes of formation of NO_x in petrol engine? Explain the effect of A : F ratio and spark advance on emission of NO_x.
 b) What are the sources of HC formation in petrol engine?

7. a) Compare ethanol and methanol as a substitute to gasoline.
 b) Discuss different properties of H₂ if used as a substitute fuel for petrol.

8. Write short notes on the following: (any four)

- a) Pumping losses
- b) Multi fuel
- c) Supercharging
- d) Detonation
- e) Carburetion

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