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

Examination, December 2015

**I.C. Engines and Alternate Fuels***Time : Three Hours**Maximum Marks : 70*

**Note :** Attempt any five questions. All questions carry equal marks.  
Draw neat diagrams wherever required.

1. a) Explain the principle of carburetion in brief with neat sketch.  
b) Discuss the elements of MPFI system. State its advantages. List the advantages and disadvantages.
2. a) What is the significance of the ASTM distillation curve? Explain in brief.  
b) Contrast high-turbulence, high compression ratio combustion chambers with those designed for lower compression ratios.
3. Define the following terms related to performance of I.C. engines:
  - a) Breathing capacity
  - b) Pumping losses
  - c) Friction losses

4. a) What are the emissions that come out of engine exhaust?  
b) What is supercharging? What is its effect on engine performance? State its advantages.
5. a) A turbocharged Diesel engine has an exhaust gas flow rate of 0.15 kg/s. The turbine entry conditions are 450°C at 1.1 bars. Calculate the turbine isentropic efficiency and power output.  
b) Why do turbochargers most commonly use radial flow compressors and turbines with non-constant pressure supply to the turbine?
6. a) Explain the working principle of Wankel Rotary combustion engine with suitable sketch.  
b) What is a non-conventional I.C. engine? What is multi-fuel engine? Explain in brief.
7. a) State brief about various hydrogen storage techniques.  
b) What is necessity for substitute fuels in I.C. engines? State its advantages and disadvantages.
8. Write short notes on following: (**Any Two**)
  - a) Electronic fuel injection system.
  - b) Hydrogen production methods.
  - c) Biogas as substituted fuel in I.C. engines.

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