JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.Tech I - Semester Examinations, March/April-2011
ADVANCED IC ENGINES
(THERMAL ENGINEERING)

Time: 3hours   Max. Marks: 60

Answer any five questions
All questions carry equal marks

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1.a)   Derive an expression for geometrical properties of reciprocating engines.
  b)   Explain the following:
       i) Engine design and performance data
       ii) Road load power.   [12]

2.   A petrol engine uses a fuel of calorific value 42000 Kg/kg. The compression and
       expansion curves follow the law $Pv^{1.B}$ = constant. At 25% and 75% of the stroke
       on the compression curve, the pressures are found to be 2 bar and 5.2 bar
       respectively. If the relative efficiency of the engine is 50% and mechanical
       efficiency is 75%, find the specific fuel consumption on B.P basis.   [12]

3.   Briefly discuss the following:
       i) Characterization of Flames
       ii) Combustion stochiometry
       iii) Enthalpies of formation
       iv) Squish.   [12]

4.a)   Sketch and explain the working of stages of combustion is S.I. Engines with P-θ
       diagram.
  b)   What are the factors affecting to flame propagation in S.I. Engines. Explain in
       detail.   [12]

5.   Explain the following:
       i) Fuel spray behavior in CI Engine.
       ii) Common land fuel injection system
       iii) Multi-point fuel injection system in S.I Engine.   [12]

6.a)   Exhaust emission and factors affecting the emission in S.I. Engines. Discuss
       green-House effect in detail.
  b)   Discuss green-House effect in detail.   [12]

7.a)   Describe with a neat sketch the working Wankel engine.
  b)   Discuss in detail:
       i) Lean living and Adiabatic concepts
       ii) Exhaust gas treatment.   [12]

8.   Write short notes on:
       a) Free positron engine
       b) Modification to IC Engines to suet Bio-fuels
       c) Swirl.   [12]

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