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**R09**

**Code No: C2108**

**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-$\theta$ 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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