

**Nomenclature Problems**

1. Find out the speed and mep at which a 4 cylinder engine using natural gas can develop a brake power of 50 kW. Air-gas ratio is 9:1, Fuel Calorific value is 34MJ/m<sup>3</sup>,  $r_k=9$ ,  $\eta_{vol}=70\%$ ,  $\eta_{th}=80\%$ , Total Volume=2 litres.
2. A 4 stroke, 4 cylinder, diesel engine at 2000 rpm, develops 60kW.  $\eta_{Brth} = 0.3$ , Fuel Calorific value is 42 MJ/kg, bore is 120 mm, stroke is 100mm,  $\rho_{air}=1.15\text{kg/m}^3$ , Air-fuel ratio is 15:1,  $\eta_{mech}=0.8$ . What is the rate of fuel consumption, air consumption, indicated thermal efficiency, volumetric efficiency, brake mean effective pressure and mean piston speed?
3. A engine has full load BHP of 50 and FHP of 8.5 kW. What are its full, half and quarter load efficiencies?
4. A 4 stroke engine has IHP of 40 kW, with 4 cylinders, and a mean piston speed of 10 m/s. A 2 stroke engine with 10 kW, has half the bore of the 4 stroke engine given with equal mep. What is its piston speed?