ASSIGNMENT: 8

1. Following data is given for a diesel engine:
   Cylinder bore = 100 mm,
   Length of connecting rod = 350 mm,
   FOS = 6,
   Maximum gas pressure = 4 MPa,
   l/d Ratio for piston pin bearing = 2,
   l/d Ratio for crank pin bearing = 1.3,
   Allowable bearing pressure for piston pin bearing = 12 MPa
   Allowable bearing pressure for crank pin bearing = 7.5 MPa

   Determine: (i) Dimensions of cross section of the connecting rod (ii) Dimensions of small and big end bearings of connecting rod.

2. Write the procedure to design a centre crankshaft subjected to maximum bending moment with neat sketch.

3. The following data is given for a single cylinder four stroke diesel engine having CI Piston: Cylinder bore = 0.30 m, Stroke length = 0.375 m, Speed = 500 rpm Maximum gas pressure = 8 MPa, Break Mean effective pressure = 1.15 MPa Break specific fuel consumption = 0.22 kg/ kW –h, H.C.V. of fuel = 42000 kJ/kg, Thermal conductivity factor = 46.5 W / m 0C, Allowable tensile stress = 37.5 N/ mm2 Temperature difference between centre and edge of piston head is 2200C Assume 5% of the total heat is developed in cylinder is transmitted by piston. Design (1) Piston Head (2) Piston pin.

4. Find the thickness of a piston crown based on thermal considerations for 4 stroke engine with following specifications:
   Engine speed = 1500 rpm
   Piston diameter = 87 mm
   Length of stroke = 96 mm
   Brake mean effective pressure = 0.7 N/mm2
   BSFC = 0.26 kg/kw-h vi. l/r ratio = 04
   Heat conducted through crown = 10% of heat generated during combustion
   Calorific value of fuel = 42 MJ/kg
   Assume that the piston is made of aluminum alloy with thermal conductivity of 175 w/moc and allowable temperature difference of 111 oc.