ASSIGNMENT

UNIT –IV

**Q1.** With the help of p-v and T-s diagram, show that for the same maximum pressure and temperature of the cycle and the same heat rejection,

ηDiesel > ηDual > ηOtto

**Q2.** Derive an expression for Efficiency in following cycles

1. Stirling Cycle

2. Air Standard Cycle

3. Bryaton Cycle

**Q3.** (a) Explain the working of four stroke and two stroke petrol engine with neat diagram.

**(b)**  List out the differences between S.I. engine and C.I. engine.

**Q4.** Determine the efficiency of diesel engine

**Q5.** Derive an expression for pressure ratio, temperature ratio and efficiency for otto cycle.

**Q6.** Derive an expression for pressure ratio, temperature ratio and entropy difference for dual cycle.

Q.7 A Carnot engine operates between two reservoirs at temperatures T 1 and T1. The work output of the engine is 0.6 times the heat rejected. The difference in temperatures between the source and the sink is 200o C. Calculate the thermal efficiency, source temperature and the sink

Temperature.

Q.8 An air engine, working on Stirlling cycle, has lower limit of temperature as 400o C. The maximum and minimum pressure limits are 12 bars and 2 bars. If the expansion ratio of the cycle is 3, find its ideal efficiency.

Q.9 An Ericssonregenerative engine works between the temperatures limits of 45oC and 230° C. If the ratio of expansion is 2, Determine :). Workdone per kg of air, and 2. Efficiency

of the cycle.

Q.10 An engine; working on the Otto cycle, has a cylinder diameter of 150 mm and a stroke of 225 mm. The clearance volume is 1.25 x 10-3 m3. Find the air standard efficiency of this engine.Take γ = 1.4.

Q.11 In an Otto cycle, air at I bar and 290 K is compressed isentropically until the pressure is 15 bar. The heat is added at constant volume until the pressure rises to 40 bar. Calculate the air standard efficiency and the mean effective pressure for the cycle. Take Cv = 0.717 kJ/kg K and Ru = 8.314 k//kg mole K.

Q.12 An ideal Diesel engine has a diameter 150 mm and stroke 200 tam. The clearance volume is 10 percent of the swept volume. Determine the compression ratio and the air standard efficiency of the engine if the cut -off takes place at 6 percent of the stroke.

Q.13 An oil engine, working on the dual combustion cycle, has a compression ratio 10 and cut-off takes place at 1/10 of the stroke. If the pressure at the beginning of compression is 1bar and maximum pressure 40 bar, determine the air standard efficiency of the cycle. Take γ = 1.4.