ANURAG GROUP OF INSTITUTIONS

Autonomous
II – B.Tech – II – Semester – II – Assignment Test 2018 -2019
Subject: TE-I

1. a trail of single cylinder oil engine working dual cycle the following observations are made: Compression ratio =15,oil consumption = 10.2 kg/hr, calorific valve= 43890 kj/kg, air consumption= 3.8 kg/min, speed=1900 rpm, torque on the brake drum= 186 n-m, quantity of cooling water used= 15.5kg/min, temp raise= 36 c, exhaust gas temp= 410 c, room temp= 20 c, Cp for exhaust gas=1.17 KJ/KGk, calculate the 1) B.P 2)BSTC 3) efficiency of brake thermal and draw the heat balance sheet on minute basis.

2. Air consumption for the four stroke petrol engine is measured by the means of circular orifice of Dia 3.2cm the coefficient of discharge for the orifice is 0.62 & pressure across the orifice is 150mm of water. The barometer reads 760mm of Hg. The temperature of air in the room is 20 c .The piston displacement volume is 0.00178 m3.The compression ratio is 6:5, fuel consumption is 0.135 kg/min of calorific value 43900 KJ/KG . The brake power developed at 2500 RPM is 28 KW. Determine the 1) the efficiency on the basis of air alone 2)Air fuel ratio 3) B.M.E.P 4)Relative efficiency on the brake thermal efficiency basis.

3. Derive the expression for work done of a single stage reciprocating compressor with an without clearance.

4. Following data relate to a performance test of single acting 14cm*10 cm reciprocating compressor. Suction pressure= 1 bar, suction temperature = 20 c, Discharge pressure =6 bar, discharge temperature = 180 c, speed of comp= 1200 rpm, shaft power = 6.25 KW, mass of air delivered = 1.7 Kg/min, calculate the 1) the actual volumetric efficiency , 2) Indicated power, 3) Isothermal efficiency 4) Mechanical efficiency 5) Overall isothermal efficiency.

5. Derive the expression for work done by two stage reciprocating air compressor with complete intercooling & incomplete intercooling.

6. A two stage single acting compressor takes in air at the rate of 0.2 M3/SEC. The intake pressure & temperature of air 0.1 MPA &16 c. The air is compressed to a final pressure of 0.7 MPA . The intermediate pressure is ideal $ intercooling is perfect. The compression index in both the stage is 1.25 & the compressor runs at 600 rpm . Neglecting clearance Find 1) Intermediate pressure 2) Power required to drive the compressor 3) Total volume of the each cylinder 4) Rate of heat rejection in the intercooler, Take Cp= 1.005 Kj/kg , R= 287 j/kg.