Sankalchand Patel College of Engineering,Visnagar.

Mid-term Examination March-2009

B.E second semester (ME, EE, EC, CE, CIVIL, IT)

Subject : Elements Of Mechanical Engineering. **Time: 10.30 a.m to 12.00 p.m**

Date: 25/03/2009 **Max.marks: 40**

Q-1 The following reading were taken during the test of single cylinder four stroke oil engine. (08)

Cylinder diameter=250mm
Stroke length=400mm
Mean effective pressure=6.5 bar
Engine speed= 250rpm
Net load on brake= 1080N
Effective dia. Of brake=1.5m
Fuel used per hour= 10kg
C.V of fuel=44300kj/kg
Calculate: indicated power, brake power, mechanical efficiency and indicated thermal efficiency.

Q-2 Attempt any two. (12)

(1) Explain with neat sketch vapour compression refregerator sysyem.
(2) Explain with neat sketch lancashire boiler.
(3) Define: Dryness fraction of steam, Wetness fraction of steam and superated steam.

Q-3 Attempt any two. (08)

(1) Define L.C.V & H.C.V
(2) Define system and also explain types of system.
(3) Define : compression ratio, and swept volume.

Q-4 Attempt any two. (12)

(1) The initial volume of 0.9 kg of a certain gas was 0.75 m^3 at a temperature of 15 °c and a pressure of 1 bar. After adiabatic compression the volume is reduced to 0.28 m^3 and the pressure was found to be 4 bar. Calculte ratio of compression heats, c_p and c_v and change in internal energy.
(2) Explain with neat sketch centrifugal pump.
(3) During the test of steam with throttling calorimeter, sample uis taken from main pipe at 15 bar pressure and temperaturew after throttling are 1.2 bar and 150 °c respectively. Determine dryness fraction of sample of steam.

Absolute Pressure	**Saturated temperature °C**	**Specific Enthalpy Kj/Kg**			**Sp. Entropy Kj/Kg °K**			**Sp. Volume m^3/Kg**	
P	**Ts**	**h_f**	**h_{fg}**	**h_g**	**s_f**	**S_{fg}**	**S_g**	**V_f**	**V_g**
15	198.3	844.7	1945.2	2789.9	2.314	4.126	6.44	0.00115	0.132
1.2	104.8	439.4	2244.1	2683.4	1.360	5.937	7.298	0.00104	1.428