B.Tech. Degree IV Semester (Special Supplementary) Examination, March 2007

ME 403 THERMAL ENGINEERING II
(Prior to 2002 Admissions)

Time: 3 Hours
Maximum Marks: 100

(All questions carry *EQUAL* marks)

I a) The following are the details of a steam power plant operating on Rankine cycle.
   Pressure limits   : 3 MPa and 75 KPa
   Maximum temperature   : 350°C
   Obtain the thermal efficiency.

   b) Explain Binary Vapour Cycles.

OR

II a) Explain Rankine cycle with reheat.
    b) Explain the internal energy and enthalpy of wet and dry steam.

III a) Write notes on governing of turbines.
     b) Obtain an expression for the thermal efficiency of a Brayton cycle.

OR

IV a) Distinguish between open and closed cycle gas turbines.
    b) Explain a gas turbine cycle with regeneration.

V a) List out the characteristics of an ideal refrigerant.
   b) Draw and explain a vapour compression system of refrigeration.

OR

VI a) Obtain an expression for the C.O.P of reversed Brayton cycle.
    b) An ideal gas refrigeration cycle using air as working medium is to maintain a refrigerated space at –18°C while rejecting heat to the surrounding medium at 27°C. The pressure ratio of the compressor is 4. Obtain the C.O.P of the cycle.

VII Explain the following:
     i) Humidity ratio
     ii) Relative humidity
     ii) Wet bulb temperature
     iv) Dry bulb temperature
     v) Dew point temperature

OR

VIII a) Explain in detail how cooling load calculations are carried out for an air-conditioning system.
      b) Explain with a neat sketch a psychrometric chart.

IX a) Explain with a neat sketch the working of a thermal power plant.
    b) Explain with a neat sketch the major components of a nuclear reactor.

OR

X a) Explain the ash and dust handling systems of a thermal power plant.
   b) Explain the layout of a hydroelectric power plant.

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