

5257

Name:

Reg.No.

EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, JUNE 2010

ME04 804 D HEATING VENTILATION AND AIRCONDITIONING SYSTEM

Time: Three hours

Maximum: 100 marks

(Answer all questions)

- I. a). State the principles of refrigeration.  
b). List down any five desirable thermal properties of a good refrigerant.  
c). Explain in brief solar radiation.  
d). What is meant by stratification?  
e). Explain in brief static method of duct design.

f). Brief about all-water and all-air system.

g). Describe thermal analysis of human body.

h). Define sensible heating and cooling process.

(8x5: 40 marks)

- II. a). (i) Define the terms. Dew point, specific humidity and relative humidity

(5 marks)

(ii) Describe how a psychrometric chart is constructed. Explain using pertinent equations for all properties represented on it. (10 marks)

(OR)

b) (i) Air at 40 °C DBT and 27 °C WBT is to be cooled and dehumidified by passing it over a refrigerant coil to give a final condition of 15 °C and 90 % RH. Find the amounts of heat and moisture removed per kg of dry air.

- III. a). Discuss about various design temperature.

(OR)

b). A cold storage is meant to store apples at 276 K. The ambient temperature is 300K. The products are cooled to the storage temperature in 24 hours. The volume required for storage of apple is about 6m<sup>3</sup>/ton and 100 tons of potatoes are to be stored. The structure load has been estimated to be 45, 000 kJ/h. Six persons are serving inside the storage. Obtain the cooling load and the capacity of the refrigeration system. The ventilation air requirement is 70 m<sup>3</sup>/h. Taking 3.4 m<sup>3</sup>/ton of space for the storage of potato. Calculate the volume of the cold storage also.

- IV. a). Derive and explain about Bernoulli's equation for air conditioning system

(OR)