R09

Code No: D9102

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
AIR CONDITIONING - II
(HEATING VENTILATION & AIR CONDITIONING)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks

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1.a) What are the advantages of all air-conditioned system over all water air-conditioned system?

b) Moist air at 28 ^{o}C DBT and 21 ^{o}C WBT flows over a 4 row cooling coil leaving air at 9.5 ^{o}C DBT and 45% RH find

i) Contact factor

ii) Apparatus dew point temperature

iii) If the air required to take a sensible heat gain of 8000 kJ/hr and latent heat gain of 1000 kJ/hr in the space being conditioned, calculate the mass of dry air which must be supplied to the room in order to maintain 21 ^{o}C DBT.

2. a) Differentiate between Central and Unitary air-conditioning systems.

b) Discuss the conditions of comfort you would prescribe for an office in a city like Nagpur which has hot and dry climate. Show the schematic arrangement of components in air conditioner and show the required processes to be undergone by the air for comfort in the office.

3.a) Explain the terms Throw, Drop, Spread, Decay and Induction in air distribution systems.

b) Discuss the various types of duct systems and their applications.

4. What are the different types of insulating materials used for air conditioned buildings? What factors are considered in selecting the insulating materials for air conditioned buildings?

5.a) What are the major effects of noise on the human comfort?

b) Discuss the relative merits and demerits of different methods of noise reduction.

6. Discuss the factors governing the performance of fans in air conditioning systems. On the basis of these factors, what are the performance differences between the different types of fans?

7. In an air cooling system of a jet aircraft, air is bled from the engine compressor at 3 bar and is cooled in heat exchanger to 10 ^{o}C. It is expanded in the air turbine with an expansion ratio 4.5. The isentropic efficiency of the turbine is 85%. The air is then discharged into the cabin and leaves the aircraft cabin at 25 ^{o}C. Calculate the temperature at which the air enters the cabin and the quantity of air required to produce refrigerating effect of one ton. Also calculate the power developed by the turbine.

8. Describe the reduced ambient type cooling system for an aircraft with the help of neat schematic diagram and show the processes on T-s plot.

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