R09

Code No: C9102

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

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

Answer any five questions
All questions carry equal marks

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1.a) Draw any two types of Psychrometric processes on chart and explain.
b) The sling-psychrometer reads 40^0C DBT and 28^0C WBT. Calculate the following
i) Specific humidity ii) Relative Humidity
iii) Vapour density in air iv) Dew point temperature
v) Enthalpy of the mixture per kg of dry air.
Assume atmospheric pressure to be 1.03 bar. Also find the above quantities if the pressure at height of 1000 meters is 0.35 bar.

2. 100 m^3 of air per minute at 40^0C DBT and 15% RH is passed through adiabatic humidifier. The air is coming out at 25^0C DBT and 20^0C WBT. Find
i) DPT ii) ϕ iii) Water carried by the air per minute.
Take Atmosphere pressure = 1 bar.

3. A cinema hall is air-conditioned when the following conditions are given.
Out door conditions = 40^0C DBT and 20^0C WBT
Required comfort conditions = 20^0C DBT and 60% RH
Seating capacity of cinema hall = 1500
Amount of out door air supplied = 0.3 m^3/min/person.
If the required condition is achieved first by adiabatic humidifying and their cooling, then find
i) Capacity of the cooling coil and surface temperature of coil if the by pass factor is 0.25
ii) Capacity of the humidifier and its efficiency.

4. Explain the following with the help of neat sketches.
a) Summer Air-conditioning b) Winter Air-conditioning
c) Year-Round Air-conditioning

5.a) Explain Heating coils with the help of a neat sketch.
b) Explain Adiabatic humidifier with sketch.

6.a) Discuss thermodynamics of human body in detail.
b) Explain briefly the term the body defence.

7. Explain briefly the following
i) Humidity and pressure controls ii) Refrigeration flow-charts
iii) Air conditioning control systems.

8. With the help of a sketch write a short note on the following
a) Sensible heat factor b) Cooling and de-humidification coil
c) Factors governing optimum effective temperature.

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