

**NEW YORK CITY COLLEGE OF TECHNOLOGY  
OF THE CITY UNIVERSITY OF NEW YORK**

**ENVIRONMENTAL CONTROL TECHNOLOGY PROGRAM**

**COURSE CODE: ENVC 2321**

**COURSE TITLE: Air Conditioning Systems Laboratory II**

**SECTION NUMBER: \_\_\_\_\_**

**PROJECT NAME: Psychrometrics**

**DATE COMPLETED: \_\_\_\_\_**

**NAME OF STUDENT: \_\_\_\_\_**

**NAME OF INSTRUCTOR: \_\_\_\_\_**

**PURPOSE:** To learn how to find the properties of air that are used in the design and testing of environmental control systems.

**EQUIPMENT:** Environmental room with an air conditioning system

**TOOLS AND INSTRUMENTS:** Psychrometer, Barometer

**PROCEDURE:**

1. Measure the dry and wet bulb temperatures of the supply air at the blower coil unit.

Supply Air Dry Bulb Temperature at Blower Coil Unit = \_\_\_\_\_ °F

Supply Air Wet Bulb Temperature at Blower Coil Unit = \_\_\_\_\_ °F

2. Measure the dry and wet bulb temperatures of the return air at the blower coil unit.

Return Air Dry Bulb Temperature at Blower Coil Unit = \_\_\_\_\_ °F

Return Air Wet Bulb Temperature at Blower Coil Unit = \_\_\_\_\_ °F

3. Measure the size of the environmental room.

Room Length = \_\_\_\_\_

Room Width = \_\_\_\_\_

Room Height = \_\_\_\_\_

4. Measure barometric pressure.

Barometric Pressure = \_\_\_\_\_ "Hg

**RESULTS:**

1. Locate the following points on a psychrometric chart, enclose each point with a symbol and identify it with the appropriate letter. (10)

Point A = Supply air at blower coil unit

Point B = Return air at blower coil unit

2. Determine the following properties of the air at points A and B. (10)

Dry Bulb Temperature at A = \_\_\_\_\_ °F

Dry Bulb Temperature at B = \_\_\_\_\_ °F

Wet Bulb Temperature at A = \_\_\_\_\_ °F

Wet Bulb Temperature at B = \_\_\_\_\_ °F

Dew Point Temperature at A = \_\_\_\_\_ °F

Dew Point Temperature at B = \_\_\_\_\_ °F

Humidity Ratio at A = \_\_\_\_\_ gr/lb

Humidity Ratio at B = \_\_\_\_\_ gr/lb

Humidity Ratio at A = \_\_\_\_\_ lb/lb

Humidity Ratio at B = \_\_\_\_\_ lb/lb

Enthalpy at A = \_\_\_\_\_ BTU/lb

Enthalpy at B = \_\_\_\_\_ BTU/lb

Relative Humidity at A = \_\_\_\_\_ %

Relative Humidity at B = \_\_\_\_\_ %

Specific Volume at A = \_\_\_\_\_ cu-ft/lb

Specific Volume at B = \_\_\_\_\_ cu-ft/lb

3. Calculate the dry bulb temperature difference for the blower coil unit. (10)

Dry Bulb Temperature Difference = Dry Bulb Temp. B - Dry Bulb Temp. A

= \_\_\_\_\_ °F - \_\_\_\_\_ °F = \_\_\_\_\_ °F

4. Calculate the humidity ratio difference for the blower coil. (10)

Humidity Ratio Difference = Humidity Ratio B - Humidity Ratio A

= \_\_\_\_\_ gr/lb - \_\_\_\_\_ gr/lb = \_\_\_\_\_ gr/lb

5. Calculate the enthalpy difference for the blower coil. (10)

Enthalpy Difference = Enthalpy B - Enthalpy A

= \_\_\_\_\_ BTU/lb - \_\_\_\_\_ BTU/lb = \_\_\_\_\_ BTU/lb

6. Calculate the volume of the room. (10)

Room Volume = (Room Length) x (Room Width) x (Room Height)

= \_\_\_\_\_ ft x \_\_\_\_\_ ft x \_\_\_\_\_ ft = \_\_\_\_\_ cu-ft

7. Calculate the weight of the air in the room. (10)

Weight of Air in Room = (Room Volume) / (Return Air Specific Volume)

= \_\_\_\_\_ cu-ft / \_\_\_\_\_ cu-ft/lb = \_\_\_\_\_ lb

8. Find the sensible heat factor of the blower coil unit. (10)

Draw a line connecting points A and B on a psychrometric chart.

Determine the sensible heat factor (ratio) of this line.

Blower Coil Unit Sensible Heat Factor = \_\_\_\_\_

The answers to the following should be in complete sentences. Points will be deducted for spelling errors, grammar errors, and poor appearance. Use quotation marks and indicate the source when copying information from a reference. (20)

9. Define dry bulb temperature.

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10. Define wet bulb temperature.

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**11. Define dew point temperature.**

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**12. Define relative humidity.**

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**13. Define humidity ratio.**

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