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Courses » Fire Protection, Services and Maintenance Management of Building

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# Unit 7 - Week 6

## Course outline

How to access the portal

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

- Introduction to HVAC
- Governing Equations for HVAC Process
- Numerical Problem on HVAC System
- Numerical Problem on HVAC System Continued
- Psychrometric Chart: Equation based Approach
- PDF of lecture slides for week 6

## Assignment 6

The due date for submitting this assignment has passed. As per our records you have not submitted this **Due on 2018-09-12, 23:59 IST.** assignment.

Please try to get all your doubts related to missing data, assignment answering and submission clarified before the due date in order to minimize the number of re-evaluations. In multiple choice questions, please mark the closest answer in case of minor differences due to rounding off the numbers.

In a room of volume  $2000 \text{ m}^3$ , the outside design conditions are  $45^\circ\text{C}$  temperature and 50% R.H (relative humidity). The desirable inside condition is  $25^\circ\text{C}$  temperature and 30% R.H (which corresponds to a moisture content of  $0.00625 \text{ kg/kg}$  of dry air). The infiltration rate is 1.5 air changes per hour.

Given, specific heat of air =  $1010 \text{ J/kg/s}$ ; Latent heat of vaporization of water =  $2500 \text{ kJ/kg}$ ; density of air at  $20^\circ\text{C}$  is  $1.2 \text{ kg/m}^3$ ; atmospheric pressure =  $1.013 \text{ bar}$ . Answer questions 1 to 6 based on the above given information.

1) Determine the moisture content (in  $\text{kg/kg}$  of dry air) corresponding to the outside design conditions.

**No, the answer is incorrect.**  
**Score: 0**

**Accepted Answers:**  
(Type: Range)  $0.0325, 0.0365$

**5 points**

2) Determine the latent heat gain through infiltration (in kW).

- 45.12
- 64.17
- 86.32

**4 points**

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Week 8	ce De	<input type="text"/>
Week 9		
Week 10		
Week 11		
Week 12		

**Hint**

**No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
(Type: Range) 16,18

**4 points**

4) Determine the temperature of the air mixture (in °C), if recirculated and fresh air constitute two thirds and one third proportion of the mixture (by mass) respectively. You may assume the total mass flow rate of the mixture to be 18 kg/s.

**No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
(Type: Range) 31,32

**2 points**

5) What is the specific enthalpy of air (in kJ/kg) for the properties corresponding to indoor design conditions?

**No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
(Type: Range) 41,41.7

**3 points**

6) What should be the temperature of supply air (in °C) if the temperature differential is 6°C?

**No, the answer is incorrect.**  
**Score: 0**  
**Accepted Answers:**  
(Type: Numeric) 19

**2 points**

