

## Unit 13 - Week 11: Gas-vapor Mixtures

### Course outline

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Week 02 : Thermodynamic Property Relations

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## Assignment 11

The due date for submitting this assignment has passed.  
As per our records you have not submitted this assignment.

**Due on 2019-10-16, 23:59 IST.**

- 1) When the temperature of a fixed mass of unsaturated moist air is reduced at constant pressure till it attains saturation, its 1 point
- absolute humidity reduces, but relative humidity increases  
 relative humidity reduces, but absolute humidity increases  
 relative humidity increases, but absolute humidity remains constant  
 absolute humidity increases, but relative humidity remains constant

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*relative humidity increases, but absolute humidity remains constant*

- 2) For an unsaturated sample of moist air, 1 point
- dry bulb temperature > wet bulb temperature > dew point temperature  
 dry bulb temperature > dew point temperature > wet bulb temperature  
 dew point temperature > wet bulb temperature > dry bulb temperature  
 wet bulb temperature > dew point temperature > dry bulb temperature

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*dry bulb temperature > wet bulb temperature > dew point temperature*

- 3) The temperature of a fixed mass of unsaturated moist air is reduced. Among the following processes, which you will allow the sample to attain the dew point the fastest? 1 point
- an isobaric process  
 an isochoric process  
 an isentropic process  
 a poytropic process described by the process equation  $Pv^2 = \text{constant}$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*an isobaric process*

- 4) Which one among the following statements is true for an adiabatic saturation process? 1 point
- temperature remains constant, while both absolute and relative humidity increase  
 temperature remains constant, while both absolute and relative humidity decrease  
 temperature decreases, while both absolute and relative humidity increase  
 temperature decreases, while both absolute and relative humidity decrease

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*temperature decreases, while both absolute and relative humidity increase*

- 5) A process represented by a vertically downward line on the psychrometric chart is 1 point
- a humidification process  
 a dehumidification process  
 a sensible heating process  
 a sensible cooling process

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*a dehumidification process*

- 6) The most desirable air conditioning process suitable for hot and dry climate is 1 point
- a heating and dehumidification process  
 a cooling & dehumidification process  
 a heating & humidification process  
 a cooling & humidification process

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*a cooling & humidification process*

- 7) A sample of moist air is initially at 100 kPa, 25°C, and relative humidity of 75%. If it is heated to 30°C, the modified relative humidity (correct to 1 decimal place) is \_\_\_\_\_%.

Hint

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*(Type: Range) 53,59*

1 point

- 8) A domestic heating system receives fresh air from an ambient at  $-10^\circ\text{C}$  temperature and 30% relative humidity. It is required to deliver an air flow rate of  $1 \text{ m}^3/\text{s}$  at  $20^\circ\text{C}$  temperature and 40% relative humidity. If a constant pressure of 100 kPa can be assumed, then the rate at which water needs to be added (correct to 1 decimal place) is \_\_\_\_\_ kg/h.

Hint

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*(Type: Range) 25.2,26*

1 point

- 9) A sample of completely dry air with a flow rate of 2 kg/s is cooled down to  $10^\circ\text{C}$  by spraying liquid water at  $10^\circ\text{C}$  into it, such that it becomes saturated moist air at  $10^\circ\text{C}$ . The process happens at steady state at a constant pressure of 100 kPa. If no heat and work transfer is involved, then the temperature of the dry air sample (correct to 1 decimal place) is \_\_\_\_\_  $^\circ\text{C}$ .

Hint

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*(Type: Range) 28.6,29.6*

1 point

- 10) A saturated moist air sample at  $20^\circ\text{C}$ , 100 kPa, is contained in a  $5\text{-m}^3$  closed tank in equilibrium with 1 kg of liquid water. The tank is heated to  $80^\circ\text{C}$ . Corresponding amount of heat transfer (correct to 1 decimal place) is \_\_\_\_\_ MJ.

Hint

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*(Type: Range) 2.5,2.8*

1 point