

# Unit 11 - Week 9: Refrigeration Cycles

## Course outline

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### Week 02 : Thermodynamic Property Relations

### Week 3 Properties of pure substances

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- Vapor compression refrigeration cycle
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- Vapor absorption refrigeration cycle
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## Assignment 9

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

**Due on 2019-10-02, 23:59 IST.**

1) For an ideal refrigerator (R) and an ideal heat pump (HP) working within the same temperature range, which among the following relations is TRUE? **1 point**

- $COP_{HP} = COP_R + 1$
- $COP_{HP} = COP_R - 1$
- $COP_{HP} = COP_R$
- $COP_{HP} = 1 / COP_R$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $COP_{HP} = COP_R + 1$

2) Among the followings, which one(s) is/are identified as the biggest practical hindrance of a reversed Carnot cycle working with condensable vapor as the working medium? **1 point**

- compressing a mixture of liquid and vapor
- heat absorption at constant temperature
- heat rejection at constant temperature
- all of the above

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*compressing a mixture of liquid and vapor*

3) Which process(s) of a reversed Carnot cycle is/are modified is a standard saturated single-stage cycle? **1 point**

- heat addition and heat rejection
- heat addition and compression
- compression and heat rejection
- heat rejection and expansion

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*heat rejection and expansion*

4) Which among the followings is not an effect of reducing the condenser temperature of a standard VCRS, while maintaining a constant evaporator temperature? **1 point**

- reduction in compressor work
- reduction in maximum cycle temperature
- increase in COP
- increase in amount of heat rejection

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*increase in amount of heat rejection*

5) The chemical symbol of refrigerant R12 is **1 point**

- $CCl_3F$
- $CCl_2F_2$
- $CClF_3$
- $CHCl_2F$

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
 $CCl_2F_2$

6) An inorganic refrigerant is represented as R7xx. Here xx represents **1 point**

- number of carbon atom in a molecule
- number of hydrogen atom in a molecule
- molecular weight
- specific gravity

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*molecular weight*

7) Use of a regenerator in the absorber circuit of a standard VARS enhances COP by **1 point**

- increasing evaporator heat absorption
- reducing generator heat requirement
- reducing condenser heat rejection
- reducing pump work

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*reducing generator heat requirement*

8) An ideal R-12 based VCR system is operating with a condenser temperature of 40°C and an evaporator temperature of 0°C. The state at the exit of the evaporator is of saturated vapor and at the exit of the condenser is of saturated liquid. Then the COP of the cycle (correct to 1 decimal place) is \_\_\_\_\_.

Hint

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*(Type: Range) 4.1,4.5*

**1 point**

9) An ideal VCR system works with R-22 as the working medium, and with condenser & evaporator temperatures of 40°C & 5°C respectively. It has been designed to produce a cooling capacity of 40 TR. It is now made to operate with an evaporator temperature of – 35°C. If the condenser temperature and volume flow rate of the refrigerant remains identical, then the modified cooling capacity (correct to 1 decimal places) is \_\_\_\_\_ TR.

Hint

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*(Type: Range) 6.4,6.8*

**1 point**

10) A heat pump uses ammonia with a low temperature of 25°C and a high pressure of 5 MPa. If it receives 1 MW of shaft work as input, then the amount of heat transferred at the high temperature (correct to 2 decimal places) is \_\_\_\_\_ MW.

Hint

No, the answer is incorrect.  
Score: 0

Accepted Answers:  
*(Type: Range) 4.3,4.5*

**1 point**