# Unit 5 - Week 3 Properties of pure substances



## Assignment 3

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

**Due on 2019-08-21, 23:59 IST.**

1) Among the following statements, which one is TRUE for a substance which expands on freezing? *1 point*

- It can stay as liquid below its triple point temperature.
- It can stay as liquid below its triple point pressure.
- It can stay as solid above its triple point temperature.
- It cannot stay as vapor below its triple point pressure.

No, the answer is incorrect.
Score: 0

Accepted Answers:
*It can stay as liquid below its triple point temperature.*

2) Compressibility factor for an ideal gas is *1 point*

- zero
- positive, but less than one
- one
- greater than one

No, the answer is incorrect.
Score: 0

Accepted Answers:
*one*

3) A real gas is likely to resemble the ideal gas behavior at *1 point*

- low temperature and low pressure
- low temperature and high pressure
- high temperature and low pressure
- high temperature and high pressure

No, the answer is incorrect.
Score: 0

Accepted Answers:
*high temperature and low pressure*

4) Density of a sample of water is found to be greater than the density of saturated liquid water at the same temperature. Then the thermodynamic state of this sample is *1 point*

- compressed liquid
- saturated liquid
- saturated liquid-vapor mixture
- superheated vapor

No, the answer is incorrect.
Score: 0

Accepted Answers:
*compressed liquid*

5) Some quantity of water is supplied with 10 MPa pressure and 0.003 $m^3$/kg specific volume. The thermodynamic state of this particular sample can be identified as *1 point*

- compressed liquid
- saturated liquid
- saturated liquid-vapor mixture
- superheated vapor

No, the answer is incorrect.
Score: 0

Accepted Answers:
*saturated liquid-vapor mixture*

6) Vapour pressure of solid ammonia (in mm of mercury) is given by, $lnP = 23.03 - \frac{3754}{T}$ That of liquid ammonia is given as, $lnP = 19.49 - \frac{3063}{T}$ Here P is in in mm of mercury and T is in K. Then the temperature of ammonia at the triple point (correct to 1 decimal place) is _____ K.

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
*(Type: Range) 194.5,195.9*

*1 point*

7) If water at 120°C with a quality of 0.25, is heated till its temperature rises by 20°C in a constant volume process, its new quality (correct to 2 decimal places) will be _____ .

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
*(Type: Range) 0.43,0.45*

*1 point*

8) An isentropic steam turbine receives 2 kg/s of steam at 6 MPa & 500°C, and leaves at a pressure of 0.3 MPa. If the expansion process can be assumed to be isentropic, then the work output from the turbine (correct to 2 decimal places) is _____ MW.

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
*(Type: Range) 1.30,1.65*

*1 point*

9) A pressure gage on a 1.2 $m^3$ oxygen tank reads 500 kPa. If the temperature is 24 °C and the atmospheric pressure is 97 kPa, then the mass of oxygen in the tank (correct to 1 decimal place) is _____ kg.

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
*(Type: Range) 9.2,9.4*

*1 point*

10) A 1 $m^3$ tank contains 2.841 kg of steam at 0.6 MPa. Using the critical-point properties of water and the van der Waals equation of state, the temperature of steam (correct to 1 decimal place) can be calculated to be _____ K.

Hint

No, the answer is incorrect.
Score: 0

Accepted Answers:
*(Type: Range) 460,470*

*1 point*