Assignment 03

The due date for submitting this assignment has passed. Due on 2018-09-05, 23:59 IST.
As per our records you have not submitted this assignment.

1) A chef is cooking mutton stew in a pan that is (a) uncovered, (b) covered with a light lid, (c) covered with a heavy lid. For which case will the cooking time be the shortest.

- (a)
- (b)
- (c)
- same in all cases

No, the answer is incorrect.
Score: 0
Accepted Answers: (c)

2) Quality (X) is a property of saturated liquid-vapour mixture. Which of the following formula correctly represents the property?

- \( \frac{m_{\text{vapour}}}{m_{\text{liquid}}} \)
- \( \frac{m_{\text{liquid}}}{m_{\text{vapour}}} \)
- \( \frac{m_{\text{vapour}}}{m_{\text{total}}} \)
- \( \frac{m_{\text{liquid}}}{m_{\text{total}}} \)

No, the answer is incorrect.
Score: 0
Accepted Answers: \( \frac{m_{\text{vapour}}}{m_{\text{total}}} \)

3) Tick the correct option about the following statement.

No substance can exist in the liquid phase in stable equilibrium at pressure below the critical point pressure

- True
- False

No, the answer is incorrect.
Score: 0
Accepted Answers: False

4) Behaviour of a gas deviates from its ideal state under which of the following conditions?

- high temperature and high pressure

No, the answer is incorrect.
Score: 0
Accepted Answers: False
5) Phase diagram is characterized by which of the following plots?

- P vs. v
- T vs. v
- P vs. 1/T
- P vs. T

No, the answer is incorrect.
Score: 0
Accepted Answers: low temperature and high pressure

6) Van der Waals equation of state was proposed to improve the ideal gas law and is governed by the following equation

\[(P + a/V^2)(V-b) = RT\]

Which of the following statement is correct?

- the constant ‘a’ is related to volume occupied by gas molecules
- the constant ‘b’ is related to intermolecular attraction force
- the constant ‘b’ is related to volume occupied by gas molecules
- none of these

No, the answer is incorrect.
Score: 0
Accepted Answers: the constant ‘b’ is related to volume occupied by gas molecules

7) Water in a 5-cm deep pan is observed to boil at 98 °C. At what temperature will the water in a 40-cm deep pan boil? Assume both pans are full of water and take density of water to be 1000 kg/m³.

- 88 °C
- 108 °C
- 120 °C
- 99 °C

No, the answer is incorrect.
Score: 0
Accepted Answers: 99 °C

8) A rigid container of 1.348-m³ is filled by R-134a of mass 10 kg at an initial temperature of -40°C. The container is then heated until the pressure is 200 kPa. Determine the final temperature and the initial pressure.

- 66.3 °C and 51.25 kPa
- 33.2 °C and 51.25 kPa
- 51.3 °C and 66.25 kPa
- 33.2 °C and 66.25 kPa

No, the answer is incorrect.
Score: 0
Accepted Answers: 66.3 °C and 51.25 kPa
9) A rigid tank with a volume of 1.8 m$^3$ contains 15 kg of saturated liquid-vapor mixture of water at 90°C. Now the water is slowly heated. Determine the temperature at which the liquid in the tank is completely vaporized.

- 100 °C
- 203 °C
- 190 °C
- 245 °C

No, the answer is incorrect.
Score: 0
Accepted Answers:
203 °C

10) A 1-m$^3$ tank containing air at 25 °C and 500 kPa is connected through a valve to another tank containing 5 kg of air at 35 °C and 200 kPa. Now the valve is opened, and the entire system is allowed to reach thermal equilibrium with the surroundings, which are at 20 °C. Determine the volume of the second tank and the final equilibrium pressure of air. Consider the gas constant of air to be $R = 0.287$ kPa.m$^3$/kg.K

- 2.21 m$^3$ and 153.1 kPa
- 2.1 m$^3$ and 153.1 kPa
- 2.21 m$^3$ and 284.1 kPa
- 2.1 m$^3$ and 284.1 kPa

No, the answer is incorrect.
Score: 0
Accepted Answers:
2.21 m$^3$ and 284.1 kPa

11) The specific volume of superheated water vapor at 3.5 MPa and 450 °C based on (a) the ideal-gas equation, (b) the generalized compressibility chart are to be calculated. Determine the error involved with reference to (a).

- 2%
- 5.1%
- 3.9%
- none of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
3.9%