Unit 4 - Week 1 :

Assignment 1

The due date for submitting this assignment has passed. **Due on 2019-08-14, 23:59 IST.**
As per our records you have not submitted this assignment.

1) The temperature of water is increased from -10°C to 110°C keeping the pressure constant at 0.5 kPa. Which among the following statements regarding the phase of water in this process is TRUE? *1 point*

(a) Ice sublimes directly from the solid to the vapour phase.
(b) Ice melts first into a liquid and then subsequently evaporates.
(c) Ice melts into a liquid and remains as a liquid till the temperature reaches 110°C.
(d) None of the above

a
b
c
d

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

2) The temperature of water is increased from -10°C to 50°C keeping the pressure constant at 10 kPa. Which among the following statements regarding the phase of water in this process is TRUE? *1 point*

(a) Ice sublimes directly from the solid to the vapour phase.
(b) Ice melts into a liquid and remains as a liquid till the temperature reaches 50°C.
(c) Ice melts first into a liquid and then subsequently evaporates.
(d) None of the above

a
b
c
d

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

3) Determine the phase of water for each of the following states. *1 point*

(1) 100°C, 90 kPa
(2) 100°C, 110 kPa
(3) 100°C, 1 m³/kg

(a) (1) Superheated vapour, (2) Subcooled liquid, (3) Saturated liquid-vapour mixture
(b) (1) Subcooled liquid, (2) Superheated vapour, (3) Superheated vapour
(c) (1) Subcooled liquid, (2) Superheated vapour, (3) Saturated liquid-vapour mixture
(d) (1) Superheated vapour, (2) Superheated vapour (3) Subcooled liquid

a
b
c
d

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

4) A pressure cooker has the lid screwed on tight. A small opening with $A = 6$ mm² is covered with a petcock that can be lifted to let steam escape. How much mass should the petcock have to allow boiling at 120°C with an outside atmosphere at 100 kPa? Assume $g = 10$ m/s². *1 point*

(a) 60 grams
(b) 102 grams
(c) 162 grams
(d) 222 grams

a
b
c
d

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

5) **Common data for Question 5 to 7:**
Determine the missing properties for water. *1 point*

T [°C]	P [kPa]	v [m³/kg]	x (if applicable)	Phase description
50	P_1	7.72	x_1	Phase 1

The value of P_1 (in kPa) is

(a) 7.384
(b) 12.350
(c) 19.941
(d) 101.3

a
b
c
d

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

6) The value of x_1 is *1 point*

(a) 0.24
(b) 0.34
(c) 0.44
(d) 0.64

a
b
c
d

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

7) Phase 1 is *1 point*

(a) Compressed liquid
(b) Superheated vapour
(c) Saturated liquid-vapour mixture
(d) Cannot be determined

a
b
c
d

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

8) **Common data for Question 8 and 9:**
Determine the missing properties for water. *1 point*

T [°C]	P [kPa]	v [m³/kg]	Phase description
250	400	v_2	Phase 2

The value of v_2 (in m³/kg) is

(a) 0.595
(b) 0.773
(c) 1.01
(d) 1.24

a
b
c
d

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

9) Phase 2 is *1 point*

(a) Compressed liquid
(b) Superheated vapour
(c) Saturated liquid-vapour mixture
(d) Cannot be determined

a
b
c
d

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

10) **Common data for Question 10 and 11:**
Determine the missing properties for water. *1 point*

T [°C]	P [kPa]	v [m³/kg]	Phase description
140	500	v_3	Phase 3

The value of v_3 (in m³/kg) is

(a) 0.509
(b) 0.306
(c) 0.217
(d) 0.001

a
b
c
d

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

11) Phase 3 is *1 point*

(a) Superheated vapour
(b) Saturated liquid-vapour mixture
(c) Compressed liquid
(d) Cannot be determined

a
b
c
d

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

12) **Common data for Question 12 to 13:**
Determine the missing properties for water. *1 point*

T [°C]	P [kPa]	v [m³/kg]	x
T_4	1000	v_4	0.75

The value of T_4 (in °C) is

(a) 151.86
(b) 179.91
(c) 198.32
(d) 212.42

a
b
c
d

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

13) The value of v_4 (in m³/kg) is *1 point*

(a) 0.0011
(b) 0.0978
(c) 0.1461
(d) 0.1933

a
b
c
d

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