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NPTEL

**Courses  »  Heat Treatment and Surface Hardening-I**

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# Unit 5 - Week-4

## Course outline

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# Assignment-4

**The due date for submitting this assignment has passed.** **Due on 2018-03-07, 23:59 IST.**
**As per our records you have not submitted this assignment.**

1) Q1: Identify the correct statement for relation of contact angle of       *1 point*
water droplet with nature of solid surface from the available options.

- ○ (a) If the contact angle is 180 $^0$, the surface of solid is hydrophilic.
- ○ (b) If the contact angle is 0 $^0$, the surface of solid is hydrophobic.
- ○ (c) If the contact angle is 180 $^0$, the surface of solid is hydrophobic.
- ○ (d) None of these.

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*(c) If the contact angle is 180 $^0$, the surface of solid is hydrophobic.*

2)                                                      *1 point*

- ○
- 
- ○
- 
- ○
- 
- ○

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**



3) Q3 For an ideal solution between A and B, the composition for       *1 point*
which molar Gibbs free energy of mixing is minimum at temperature and
pressure of 300 K and 1atm, respectively.

- ○ (a)  $X_A = 1, X_B = 0.5,$
- ○ (b) $X_A = 2, X_B = 0,$
- ○ (c) $X_A = 0.5, X_B = 0.5$
- ○ (d) $X_A = 0.5, X_B = 2,$

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**

*(c)* $X_A = 0.5, X_B = 0.5$

4) Q4 What is the degree of freedom at the invariant point in a phase diagram?                                             *1 point*

- (a) 1
- (b) 0
- (c) 2
- (d) 3

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*(b) 0*

5) Q5 For transformations that occur at constant temperature and pressure, the most stable transformation corresponds to                                             *1 point*

- (a) Highest Gibbs free energy change
- (b) Highest Helmholtz free energy change
- (c) Highest internal energy and highest enthalpy change
- (d) Highest entropy change

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*(a) Highest Gibbs free energy change*

6) Q6 The line/surface in an equilibrium diagram, which indicates the temperature of the beginning of solidification or completion of melting is called as:                                             *1 point*

- (a) Solidus
- (b) Liquids
- (c) Melting point
- (d) None of these

**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**
*(b) Liquids*

7)                                             *1 point*

- ○

- ○

- ○



- ○



**No, the answer is incorrect.**
**Score: 0**

**Accepted Answers:**

8) Q8 A binary phase diagram (AB) is shown in the figure   *1 point*
below. The alloy composition is 40 wt%-B (shown in the
figure). Mass fraction of α at the temperature of $150^0$C will
be:

- (a) 0.35
- (b) 0.50
- (c) 0.66
- (d) 0.60

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(c) 0.66*

9) Q9 In single component system, the maximum number of phases that *1 point*
can co-exist in equilibrium is/are:

- (a) 1
- (b) 4
- (c) 3
- (d) 5

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(c) 3*

10) Q10 The degrees of freedom at any point along the ice-water phase   *1 point*
boundary in the phase diagram of water will be:

- (a) 0
- (b) 1
- (c) 2
- (d) Can not be calculated.

**No, the answer is incorrect.**

**Score: 0**

**Accepted Answers:**

*(b) 1*

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