### Assignment 8

**Due date for submitting this assignment has passed.**

All grade results for this assignment will be provided on [Grade View](#).

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**Problem 1:**

1. The following element is known to segregate/misplace during solidification of steel:

   - Si
   - C
   - Mn
   - Fe

   **Required:** Mn

2. High segregation will result in the following problems during solidification:

   - Lower liquation
   - Lower viscosity
   - Higher solid phase
   - No effect

   **Required:** Lower liquation

3. Build fraction \( f_b \) during casting increases from 0 to 1. 20% corresponds to:

   - \( f_b = 0 \)
   - \( f_b = 0.67 \)
   - \( f_b = 0.69 \)
   - \( f_b = 1 \)

   **Required:** \( f_b = 0.67 \)

4. Build fraction \( f_b \) during casting increases from 0 to 1. 20% corresponds to:

   - \( f_b = 0 \)
   - \( f_b = 0.67 \)
   - \( f_b = 0.69 \)
   - \( f_b = 1 \)

   **Required:** \( f_b = 0.69 \)

5. Strength of steel during solidification depends on:

   - Grain thickness
   - Length
   - Properties of solid and liquid
   - Nuclear interaction

   **Required:** Properties of solid and liquid

6. The following is the approximate rise in temperature zone during solidification:

   - \( f_b = 1 \)
   - \( f_b = 0.5 \)
   - \( f_b = 0.3 \)
   - \( f_b = 0 \)

   **Required:** \( f_b = 0.5 \)

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**Problem 2:**

1. The transformation in \( 0.04 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Widmanstatten

2. The transformation in \( 0.01 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Ferrite

3. The transformation in \( 0.005 \%\) C steel occur in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 3:**

1. The transformation in \( 0.5 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 4:**

1. The transformation in \( 0.04 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 5:**

1. The transformation in \( 0.01 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Ferrite

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**Problem 6:**

1. The transformation in \( 0.005 \%\) C steel occur in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 7:**

1. The transformation in \( 0.5 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 8:**

1. The transformation in \( 0.04 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 9:**

1. The transformation in \( 0.01 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Ferrite

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**Problem 10:**

1. The transformation in \( 0.005 \%\) C steel occur in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 11:**

1. The transformation in \( 0.5 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 12:**

1. The transformation in \( 0.04 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 13:**

1. The transformation in \( 0.01 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Ferrite

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**Problem 14:**

1. The transformation in \( 0.005 \%\) C steel occur in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 15:**

1. The transformation in \( 0.5 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 16:**

1. The transformation in \( 0.04 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 17:**

1. The transformation in \( 0.01 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Ferrite

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**Problem 18:**

1. The transformation in \( 0.005 \%\) C steel occur in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 19:**

1. The transformation in \( 0.5 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 20:**

1. The transformation in \( 0.04 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 21:**

1. The transformation in \( 0.01 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Ferrite

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**Problem 22:**

1. The transformation in \( 0.005 \%\) C steel occur in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite

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**Problem 23:**

1. The transformation in \( 0.5 \%\) C steel occurs in following stages:

   - Austenite
   - Ferrite
   - Widmanstatten
   - Pearlite

   **Required:** Pearlite