Assignment 7

The due date for submitting this assignment has passed. Due on 2018-03-28, 23:59 IST.
As per our records you have not submitted this assignment.

1) Ravi performed an experiment related to heat treatment of steel. He found that 20% of austenite was transformed into pearlite in 10 minutes whereas 25 minutes were required for 70% transformation of austenite. If it is assumed that kinetics of transformation of austenite to pearlite follows the Avrami equation \( y = 1 - \exp\left(-kt^n\right) \). The value of exponent 'n' will be

- 0.5
- 1.8
- 3.1
- 4.5

No, the answer is incorrect.
Score: 0
Accepted Answers: 1.8

2) In question no. 1, the value of constant 'k' will be

- \( 3.3 \times 10^{-3} \)
- \( 2.3 \times 10^{-4} \)
- \( 8.9 \times 10^{-2} \)
- \( 4.6 \times 10^{-5} \)

No, the answer is incorrect.
Score: 0
Accepted Answers: \( 3.3 \times 10^{-3} \)

3) In question no. 1, the total time (minutes) required to transform 90% of austenite in to pearlite will be

- 30.1
- 35.7
- 42.1
- 47.3

No, the answer is incorrect.
Score: 0
Accepted Answers: 35.7

4) In Avrami equation \( y = 1 - \exp\left(-kt^n\right) \), the expression for fraction transformed corresponding to maximum rate of transformation will be

1 point
5) In Avrami equation \( y = 1 - \exp(-kt^n) \), the constant ‘\( k \)’ and exponent ‘\( n \)’ are \( 4 \times 10^{-6} \) and 3, respectively. The fraction transformed corresponding to maximum rate of transformation will be

- \( 0.38 \)
- \( 0.59 \)
- \( 0.28 \)
- \( 0.49 \)

No, the answer is incorrect.
Score: 0
Accepted Answers:
\( f = 1 - \exp( - (n-1)/n) \)

6) For some transformation having kinetics that obey the Avrami equation \( y = 1 - \exp(-kt^n) \), the parameter \( n \) is known to have a value of 1.5. If, after 125 s, the reaction is 25% complete, total time for the transformation to get 90% completed will be

- 420 s
- 510 s
- 630 s
- 370 s

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

7) If a hypereutectoid steel sample is heated to 1000°C in a furnace and then continuously cooled in air to room temperature then the microstructure obtained will be

- Pearlite + Bainite
- Pearlite + Martensite
- Pearlite + Cementite
- Pearlite + Ferrite

No, the answer is incorrect.
Score: 0
Accepted Answers:
Pearlite + Cementite

8) During diffusion controlled growth, if the growth rate is \( G \) at time \( t \), then at time \( 4t \), the growth rate will be ______ times \( G \)

- 0.25
- 0.50
- 0.75
- 0.90

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.50
9) During interface controlled growth, with increase in the degree of undercooling, the growth rate
   - Always increases
   - Always decreases
   - First increases then decreases
   - First decreases then increases

   No, the answer is incorrect.
   Score: 0
   Accepted Answers:
   First increases then decreases

10) During heat treatment, due to increase in the cooling rate after heating to the same temperature, the hardness will
   - increase
   - decrease
   - remains constant
   - can not be decided

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