Unit 8 - Week 6: Different Phase Diagrams

Assignment 6

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment. Due on 2018-10-10, 23:59 IST.

1) At what temperature, α-Fe transforms to γ-Fe?
   - 910°C  [2 points]
   - 1394°C
   - 727°C
   - 1147°C

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: 910°C

2) Percentage of carbon in cast iron is generally:
   - less than 0.8 wt%
   - less than 2 wt%
   - greater than 2 wt%
   - between 0.8 wt% to 1 wt%

   No, the answer is incorrect.
   Score: 0
   Accepted Answers: greater than 2 wt%

3) Answer questions 3 to 8, based on the information given in Iron-Carbon phase diagram as shown below.

   At 1147°C, ledeburite forms at the eutectic composition i.e. 4.3 wt% carbon in iron and is a eutectic mixture of austenite and cementite. At 727°C, pearlite forms at the eutectoid composition i.e. 0.76 wt% carbon in iron and is a eutectoid mixture of ferrite and cementite.
On cooling 0.4 wt% C steel from single phase austenite region, what would be the proportion of phase(s) just above 727°C?

- 48.7 wt% α-Fe and 51.2 wt% γ-Fe
- 51.2 wt% α-Fe and 48.7 wt% γ-Fe
- 94.3% α-Fe and 5.7% Fe3C
- 94.3% Fe3C and 5.7% α-Fe

No, the answer is incorrect.
Score: 0
Accepted Answers:
48.7 wt% α-Fe and 51.2 wt% γ-Fe

4) The proportions of α-Fe and Cementite (CM) at the eutectoid composition are

- 0.88 wt% α
- 0.12 wt% CM
- 0.12 wt% α
- 0.88 wt% CM

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.88 wt% α
0.12 wt% CM

5) The hypo-eutectoid region in steels is for

- Carbon content from 0.76 to 1.0 wt% below 727°C
- Carbon content from 0 to 0.76 wt% below 727°C
- Carbon content from 2.1 to 6.67 wt% between 1147°C and 727°C
- Carbon content from 2.1 to 4.3 wt% between 1147°C and 727°C

No, the answer is incorrect.
Score: 0
Accepted Answers:
Carbon content from 0 to 0.76 wt% below 727°C
Using Fe-C diagram, Grey cast iron is produced by:
- slow cooling from temperature just below eutectoid temperature
- fast cooling from temperature just below eutectoid temperature
- slow cooling from austenite and ledeburite region
- moderate cooling from austenite and ledeburite region

No, the answer is incorrect. Score: 0

Accepted Answers:
- slow cooling from austenite and ledeburite region
- moderate cooling from austenite and ledeburite region

Using Fe-C diagram, White cast iron can be produced by:
- fast cooling from austenite and ledeburite region, temperatures between eutectic and eutectoid temperatures
- slow cooling from austenite and ledeburite region, temperatures between eutectic and eutectoid temperatures
- fast cooling from the eutectoid temperature
- fast cooling from the temperature just below eutectoid temperature

No, the answer is incorrect. Score: 0

Accepted Answers:
- fast cooling from austenite and ledeburite region, temperatures between eutectic and eutectoid temperatures

Using Fe-C diagram, Malleable cast iron can be produced by:
- reheating the white cast iron to 950ºC and slow cooling it to eutectoid temperature and then fast cooling it to room temperature
- reheating the white cast iron to 750ºC and slow cooling it to room temperature
- reheating the white cast iron to 950ºC and slow cooling it to room temperature following by fast cooling to room temperature
- reheating the white cast iron to 950ºC and holding it at just above eutectoid temperature following by fast cooling to room temperature

No, the answer is incorrect. Score: 0

Accepted Answers:
- reheating the white cast iron to 950ºC and slow cooling it to room temperature

A grey cast iron's microstructure may consist of:
- Graphite flakes in ferritic matrix
- Graphite flakes in pearlitic matrix
- Pearlite in cementite matrix
- Pearlite in ferrite matrix

No, the answer is incorrect. Score: 0

Accepted Answers:
- Graphite flakes in ferritic matrix
- Graphite flakes in pearlitic matrix

Which of the statement is/are correct?

Score: 2 points

Answer:
- Graphite flakes in ferritic matrix
- Graphite flakes in pearlitic matrix
11. MCI (Malleable cast Iron) has higher strength and ductility over GCI (Gray cast Iron) 2 points

No, the answer is incorrect.
Score: 0
Accepted Answers:
MCI (Malleable cast Iron) has higher strength and ductility over GCI (Gray cast Iron)

11. Crystal structure of austenite (γ-Fe) phase of Fe is 2 points

- Simple Cubic
- Face Centred Cubic
- Body Centred Cubic
- Orthorhombic

No, the answer is incorrect.
Score: 0
Accepted Answers:
Face Centred Cubic

12. Presence of Si contents higher than 2-3% in cast irons generally favours formation of 2 points

- white cast iron
- malleable cast iron
- grey cast iron
- nodular cast iron

No, the answer is incorrect.
Score: 0
Accepted Answers:
grey cast iron

13. In Cu-Zn phase diagram, at what temperature β (disordered) to β' (ordered) phase happens at 2 points

- 465°C
- 903°C
- 700°C
- 835°C

No, the answer is incorrect.
Score: 0
Accepted Answers:
465°C

14. The approximate amount of Zn in α-Brass is: 2 points

- less than 37%
- between 37-47%
- Higher than 47%
- 50%

No, the answer is incorrect.
Formation of nodules of graphite in cast irons is favoured by addition of which of the following elements?

- Mg
- Ca
- Na
- Ce

No, the answer is incorrect.

Score: 0
Accepted Answers:
Mg
Ce