Assignment 5

The due date for submitting this assignment has passed. Due on 2018-10-03, 23:59 IST. As per our records you have not submitted this assignment.

1) Which of the following is/are true about pearlite?

- Pearlite is a phase.  
- Pearlite is mixture of two phases.  
- Pearlite is formed after cooling of ferrite phase.  
- Pearlite is formed after cooling of austenite phase.  

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
Pearlite is mixture of two phases.  
Pearlite is formed after cooling of austenite phase.

2) The phase reaction that yields two new solid phases (\(\beta\) and \(\gamma\)) on cooling from a single solid phase (\(\alpha\)) is called

- Eutectoid  
- Peritectoid  
- Eutectic  
- Congruent

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

3) The boundary between two solid regions in a phase diagram is called as

- Solvus  
- Liquidus  
- Eutectic  
- Hypoeutectic

No, the answer is incorrect.  
Score: 0

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4) What is solutionizing process?  
☐ To heat a material at high temperature in single phase region and hold it.  
☐ To cool down the material and hold it at low temperature.  
☐ Heating into two phase region and holding.  
☐ Slowly cooling down.  

**No, the answer is incorrect.**  
Score: 0  
Accepted Answers:  
*To heat a material at high temperature in single phase region and hold it.*

5) A colony or set of parallel features in a eutectic mixture during cooling is called as  
☐ Lamellar  
☐ Golublar  
☐ Nodules  
☐ Flakes  

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

6) In general, which of the following morphologies depicts the coexistence of eutectoid mixture and pro-eutectoid phase?  
☐ Proeutectoid phase has elongated shape while eutectoid mixture has lamellar structure  
☐ Proeutectoid phase has elongated shape while eutectoid mixture has globular or equiaxed morphology  
☐ Proeutectoid phase has nearly globular or equiaxed shape, eutectoid mixture has lamellar structure  
☐ Both have lamellar morphology  

**No, the answer is incorrect.**  
Score: 0  
Accepted Answers:  
*Proeutectoid phase has nearly globular or equiaxed shape, eutectoid mixture has lamellar structure*

7) The Al–Si phase diagram is of a simple eutectic type phase diagram. At 577°C, solid Al (1.5% Si), solid Si (100% Si) and liquid (12.5%) Si are in equilibrium. Consider an aluminium wire welded to a silicon substrate. Just below the weld inside the substrate, the microstructure shows 2% of a eutectic-like mixture in a Silicon matrix. What is the likely composition at this location?  
☐ 98.00% Si  
☐ 95.60% Si  
☐ 98.28% Si  
☐ 97.36% Si  

**No, the answer is incorrect.**  
Score: 0  
Accepted Answers:  
*98.28% Si*

8) Use the information provided the phase diagram shown below and correlate it with the microstructures shown below to answer questions 8-12.  

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**Answer:**

The given text contains questions related to phase diagrams, solutionizing process, and the characteristics of eutectic mixtures. It also involves questions about the composition of a eutectic-like mixture in a silicon matrix and requires an understanding of the Al–Si phase diagram to provide accurate answers. The text is structured in a clear manner, making it easy to follow and understand the context of each question.
The microstructure at point A is

☐ 1
☐ 2
☐ 3
☐ 5

No, the answer is incorrect.
Score: 0
Accepted Answers: 3

9) Microstructure at point B

☐ 1
☐ 2
☐ 3
☐ 4

No, the answer is incorrect.
Score: 0
Accepted Answers: 1

10) Microstructure at point C

☐ 1
☐ 2
☐ 3
☐ 5

No, the answer is incorrect.
11. Microstructure at point D

No, the answer is incorrect.

Score: 0
Accepted Answers: 2

12. Microstructure at point E

No, the answer is incorrect.

Score: 0
Accepted Answers: 4

13. Use the following phase diagram for a lead–tin alloy. For an alloy of composition 80 wt% Sn – 20 wt% Pb and at 180°C (335°F), answer the following questions:

The mass fractions of α and β phases are:
14) The mass fractions of primary $\beta$ and eutectic microconstituents are:

- 0.224 and 0.776 respectively
- 0.776 and 0.224 respectively
- 0.826 and 0.174 respectively
- 0.174 and 0.826 respectively

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.224 and 0.776 respectively

15) The mass fraction of eutectic $\beta$ is:

- 0.287
- 0.224
- 0.280
- 0.272

No, the answer is incorrect.
Score: 0
Accepted Answers:
0.272