1. *Calculate the fraction of atom sites that are vacant for lead at its melting point of 327 °C . Assume energy for vacancy formation of 0.55 eV/atom*
2. *Explain the differences in grain structure for a metal that has been cold worked and one that has been cold worked and then recrystallized?*
3. *What is the driving force for recrystallization?*
4. *What is the driving force for grain growth?*
5. *What thermodynamic condition must be met for a state of equilibrium to exist?*
6. *Cite one undesirable consequence of coring*
7. *What is the distinction between hypoeutectoid and hypereutectoid steels?*
8. *Name the two stages involved in the formation of particles of a new phase. Briefly describe each.*

9. *Cite two important differences between continuous cooling transformation diagrams for plain carbon and alloy steels.*
10. *On the basis of microstructure, briefly explain why gray iron is brittle and weak in tension.*
11. *What is the chief difference between heat-treatable and non-heat-treatable alloys?*
12. *Describe one problem that might exist with a steel weld that was cooled very rapidly.*
13. *Briefly explain the difference between hardness and hardenability*
14. *What influence does the presence of alloying elements (other than carbon) have on the shape of a hardenability curve?*
15. *How would you expect a decrease in the austenite grain size to affect the hardenability of a steel alloy?*