1. Which type of phase diagram represents the relationship between temperature and composition for alloys where two completely soluble components form a single phase?
a) Isomorphous
b) Eutectic
c) Peritectic
d) Eutectoid

Answer: a) Isomorphous

Explanation: In an isomorphous phase diagram, two completely soluble components form a single-phase solution across all compositions and temperatures.

2. What is the composition of a eutectic alloy at the eutectic point?
a) Pure metal
b) Mixture of two metals
c) Intermediate composition
d) Alloy with impurities

Answer: b) Mixture of two metals

Explanation: At the eutectic point, a eutectic alloy consists of a specific composition of two metals that solidify simultaneously from the liquid phase.

3. Which phase transformation involves the simultaneous transformation of austenite into ferrite and cementite?
a) Eutectoid
b) Peritectic
c) Isomorphous

d) Eutectic

Answer: a) Eutectoid

Explanation: The eutectoid transformation involves the simultaneous transformation of austenite into ferrite and cementite in specific proportions.

4. What is the phase that forms when a eutectoid steel is cooled from the austenite phase at a slow rate?
a) Pearlite
b) Bainite
c) Martensite
d) Ferrite

Answer: a) Pearlite

Explanation: When a eutectoid steel is cooled slowly from the austenite phase, it forms pearlite, which is a lamellar mixture of ferrite and cementite.

5. Which type of cast iron contains graphite flakes dispersed in a matrix of ferrite or pearlite?
a) Gray cast iron
b) White cast iron
c) Ductile cast iron
d) Malleable cast iron

Answer: a) Gray cast iron

Explanation: Gray cast iron contains graphite flakes dispersed in a matrix of ferrite or

pearlite, which gives it its characteristic gray color.

6. What is the main alloying element in stainless steel to enhance corrosion resistance?
a) Chromium
b) Nickel
c) Carbon
d) Manganese

Answer: a) Chromium

Explanation: Chromium is the main alloying element in stainless steel to enhance its corrosion resistance properties.

7. Which type of stainless steel is non-magnetic and commonly used in applications requiring high corrosion resistance?
a) Austenitic stainless steel
b) Ferritic stainless steel
c) Martensitic stainless steel
d) Duplex stainless steel

Answer: a) Austenitic stainless steel

Explanation: Austenitic stainless steel is non-magnetic and exhibits high corrosion resistance, making it suitable for various applications including food processing, chemical industry, and medical equipment.

8. Which term describes the ability of a material to return to its original shape after deformation when the load is removed?

a) Elastic
b) Anelastic
c) Viscoelastic
d) Plastic

Answer: a) Elastic

Explanation: Elastic behavior refers to the ability of a material to return to its original shape after deformation when the load is removed, without permanent deformation.

9. What type of behavior involves temporary deformation under stress, with gradual recovery upon removal of the stress?
a) Anelastic
b) Viscoelastic
c) Plastic
d) Elastic

Answer: b) Viscoelastic

Explanation: Viscoelastic behavior involves both elastic and viscous components, resulting in temporary deformation under stress and gradual recovery upon removal of the stress.

10. Which type of cast iron has a high carbon content and appears white due to the presence of cementite?
a) White cast iron
b) Gray cast iron
c) Malleable cast iron
d) Ductile cast iron

Answer: a) White cast iron

Explanation: White cast iron has a high carbon content and appears white due to the presence of cementite, resulting from rapid cooling during solidification.

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