

19 Multiple choice questions

1. a hard brittle iron carbide compound with formula Fe_3C , found in carbon
 - a. ferrite
 - b. current
 - c. austenite
 - d. cementite
2. applies to any one of several processes involving heating metals to controlled temperatures for specific period of time, and afterwards cooling them at controlled rates; these may be applied to soften work-hardened material but more generally they are used to strengthen alloys
 - a. current
 - b. annealing
 - c. austenite
 - d. heat treatment
3. discontinuities in the crystal lattice of a metal; the movement of these under stress may be used to explain slip, creep, etc.
 - a. ductility
 - b. cast iron
 - c. dislocations
 - d. annealing
4. a system of forces that exerts a resultant moment but no resultant force
 - a. current
 - b. couple
 - c. bronze
 - d. magnet
5. involves changing the shape or size of metal by plastic deformation; carried out below the recrystallisation point, usually at room temperature; hardness and tensile strength are increased while ductility and impact values are lowered
 - a. cast iron
 - b. cold working
 - c. case hardening
 - d. annealing

6. an alloy of copper and up to 10% tin, known as tin bronze; alloys of copper and up to 10% aluminium are known as aluminium bronzes, while alloys of copper and up to 5% silicon are known as silicon bronzes
 - a. brass
 - b. ferrite
 - c. couple
 - d. bronze
7. a face centred cubic (FCC) phase in the iron-carbon equilibrium diagram, designated by the symbol gamma (γ), this is a non-magnetic solid solution of carbon in iron
 - a. ductility
 - b. austenite
 - c. cementite
 - d. current
8. the purpose of this process may be to remove stresses, soften, obtain a desired structure or improve machinability and cold working properties; it involves heating steel to and holding at a suitable temperature, followed by a relatively slow cooling
 - a. ferrite
 - b. ductility
 - c. cementite
 - d. annealing
9. those metals in which primary constituent is iron (Fe)
 - a. brass
 - b. ferrous
 - c. current
 - d. ferrite
10. an alloy of iron and carbon in which carbon is an excess of the amount that can be retained in solid solution in austenite at the eutectic temperature; carbon is usually present in the range of approximately 2% to 4.5%; in addition, silicon, manganese, sulphur and phosphorus are contained in varying amounts
 - a. brass
 - b. current
 - c. austenite
 - d. cast iron
11. a metal and element, this substance is lightweight, corrosion resistant, ductile, malleable, machinable and has excellent castability
 - a. austenite
 - b. ductility
 - c. cementite
 - d. aluminium

12. it gets its name from the way that the direction of electron flow changes or alternates; in this process the positive and negative charges at either end of the conductor switch positions which results in reversals of electron direction.
 - a. heat treatment
 - b. current
 - c. annealing
 - d. alternating current
13. body centred cubic (BCC) phase in the iron-carbon phase diagram; may exist in either a low temperature alpha or a high temperature delta form
 - a. bronze
 - b. ferrite
 - c. ferrous
 - d. cementite
14. provides a constant flow of electrons in a single direction from negative to positive
 - a. current
 - b. case hardening
 - c. direct current (DC)
 - d. heat treatment
15. a piece of iron or other material exhibiting the properties of magnetism, i.e. it generates a force or magnetic field that attracts other ferromagnetic materials such as iron and attracts or repels other magnets
 - a. current
 - b. magnet
 - c. couple
 - d. bronze
16. the rate of electrically charged particles measured in amperes
 - a. ferrous
 - b. ferrite
 - c. current
 - d. magnet
17. the ease with which a material deforms plastically while undergoing tensile forces
 - a. ferrite
 - b. aluminium
 - c. austenite
 - d. ductility

18. an alloy of copper and up to 43% zinc
- a. ferrous
 - b. brass
 - c. bronze
 - d. magnet
19. a process of surface hardening involving a change in the composition of the outer layer of a ferrous alloy; typical hardening processes are carburising, cyaniding, carbonating and nitriding
- a. case hardening
 - b. cold working
 - c. annealing
 - d. cast iron