Quizlet NAME _____

20 Multiple choice questions

1. a quantum (bundle) of energy
    a. photon
    b. holes
    c. n-type
    d. photocells

2. uses magnetic levitation for propulsion
    a. Planck, Max
    b. germanium
    c. maglev train
    d. maltese cross

3. occurs as a consequence of the wave nature of electrons; electrons exhibit diffraction when they pass through a crystal lattice
    a. electron sea model
    b. electron diffraction
    c. electron guns
    d. electron-hole pairs

4. the screen of a cathode ray tube whose surface is coated with a material that fluoresces to emit light when struck with electrons; it is used to form an image of an electrical signal
    a. florescent screen
    b. maltese cross
    c. photocells
    d. filament

5. an evacuated tube with a metal cross in it; used to show that cathode rays travel in straight lines
    a. photocells
    b. maglev train
    c. maltese cross
    d. paddle wheels

6. represent where the electron energies of large number of electrons in matter are spread over bands; the highest occupied energy band is the valence band; above the valence band is the conduction band; between these bands is the forbidden energy gap
    a. energy bands
    b. germanium
    c. electron guns
    d. n-type

7. a German physicist who demonstrated the existence of electromagnetic waves after James Clerk Maxwell had predicted them; he also discovered the photoelectric effect but failed to investigate it further
    a. energy bands
    b. maltese cross
    c. germanium
    d. Hertz, Heinrich

8. semiconductor material has electrons as the majority carriers and holes as the minority carriers; doped with group V atoms
    a. filament
    b. n-type
    c. holes
    d. photon

9. a group IV element, which was originally used in semiconductor devices but now superseded by silicon as the preferred choice
    a. energy bands
    b. photon
    c. germanium
    d. filament

10. occur at temperatures above 0 K when some electrons gain sufficient energy to escape from their bonds and exist as free electrons, which leaves a hole behind; the electron and hole form an electron-hole pair
    a. electron guns
    b. electron diffraction
    c. electron sea model
    d. electron-hole pairs

11. the emission of electrons by materials when subjected to electromagnetic radiation of appropriate frequency; Einstein explained the photoelectric effect and showed the particle nature of light
    a. photocells
    b. photoelectric effect
    c. meissner effect
    d. electron guns

12. a thin wire with high electrical resistance; when current passes through it, it gets hot
    a. filament
    b. holes
    c. photon
    d. n-type

13. electrical conduction in doped semiconductors
    a. electron diffraction
    b. electron sea model
    c. extrinsic conduction
    d. energy bands

14. describes the circumstances by which in a metal, positive ions in the lattice are surrounded by a moving 'sea' of electrons
    a. electron guns
    b. electron sea model
    c. electron diffraction
    d. electron-hole pairs

15. a German scientist credited with discovering quantum theory when investigating black body radiation; he found he could only get agreement between experiment and theory by postulating that light came in photons or quanta or bundles of energy
    a. Planck, Max
    b. n-type
    c. photocells
    d. maglev train

16. cells in which the electrons initiating an electric current are produced by the photoelectric effect
    a. holes
    b. n-type
    c. photon
    d. photocells

17. devices that produce a narrow beam of electrons in a cathode ray tube by thermionic emission, which consists of a filament, a cathode and two open-cylinder anodes
    a. electron sea model
    b. electron guns
    c. electron-hole pairs
    d. energy bands

18. represent the absence of an electron in an energy level; formed when a group IV element (e.g. silicon) is doped with a group III element
    a. holes
    b. filament
    c. photon
    d. n-type

19. the exclusion of a magnetic field by a superconductor
    a. meissner effect
    b. filament
    c. maltese cross
    d. photoelectric effect

20. discharge tubes used to show that cathode rays carry energy and momentum
    a. photocells
    b. paddle wheels
    c. maltese cross
    d. maglev train