Engineering Materials (MSE-220)

Assignment #2

1. Which of the following is a physical property?

a. color
b. hardness
c. microstructure
d. valence
e. electronegativity
f. composition

2. List the chemical and physical properties that are important for a material to be used for a door knob.

3. Which of the following is not a chemical property?

a. corrosivity
b. chemical reactivity
c. composition
d. solubility
e. moisture absorption
f. specific gravity

4. Which of the following does not play a role in chemical properties of a material?

a. valence
b. melting point
c. composition
d. atomic number
e. corrosivity
f. friction

5. Calculate the energy required to heat a cast iron frying pan weighing 1kg to searing temperature of 200°C. (Assume no lost heat.)

6. Which of the following is the best heat insulator?

a. Fe
b. Ni
c. Ag
d. Ti
e. W
f. Mo

7. Calculate the ohmic resistance of 100 m of 1mm diameter copper wire, compared with the same length of nickel wire.

8. Which of the following is the best electrical conductor?

a. Cu
b. Ag
c. Pt
e. Hg
f. Ni
g. Au

9. A brick has dimensions of 60 x 80 x 400 mm and a weight of 3 kg. What is its apparent density?

10. What is the density of the alloy Monel (30% nickel, Cu remainder)?

11. Calculate the spring constant for a one-inch cube of polystyrene.

12. Explain the concept of tensile strain and how it is measured.

13. What is the principle behind a wire strain sensor (gage)?

14. Which of the following is considered to be an electrical conductor?

a. Hg
b. Cl
c. Na
d. O
e. N
f. B

15. What makes materials different colors?

16. What is the difference between electrical conductivity and resistivity?