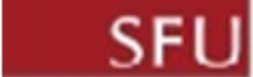


MSE-220 — Engineering Materials



Quiz 1- Sep, 29th, 2017

Student Name:

Student Number:

- Answer the following question, fill in the blanks and choose the right answer whichever is appropriate.

- 1- What are the four major components of material science and material engineering? (Ch 1-prt 1-Slide 9)
 - a. Structure of Materials
 - b. Properties of Materials
 - c. Processing of Materials
 - d. Performance of Materials

- 2- Materials are classified in the four broad categories which are: (Ch 1-prt 1-Slide 29)
 - a. Metals
 - b. Ceramics
 - c. Polymers
 - d. Composites

- 3- What is an indicator of the density of an element in periodic table? (Ch 2-Slide 13)

- Ans: Atomic weight

- 4- Name 2 applications and 2 key characteristics for the following engineering materials: (Ch 2-Slide 16)
 - Metals: Applications: building frame, autos, heavy equipment, etc.
 - Key: cheap, strong and ductile, easily fabricated
 - Ceramics: Applications: Electronics, cutting tools, glass, building materials, etc.
 - Key: Extremely hard w/high temp capability (little thermal expansion)
 - Polymers: Applications: packaging, medical equipment, moderate load carrying applications, etc.
 - Key: Cheap, reasonably strong, variety of materials
 - Composites: Applications: Autos, aerospace, etc.
 - Key: high strength to weight ratio
- 5- What are the four common or typical crystal structures? (Ch 2-Slide 16)
 - Ans: Simple cubic, Body-centred cubic, Face-centred cubic and Hexagonal closed-pack

- **6- What are the four methods for strengthening metals and preventing failure due to dislocation? (Ch 2-Slide 32)**
- **Ans: Alloying, Cold working, Heat treatment (Precipitation hardening), Quenching (Dispersion Hardening)**

- **7- What is the significance of alumina? (Ch 2-Slide 39)**
- **Ans: Aluminium oxide which is also commonly called alumina.**

- **Al₂O₃ is significant in its use to produce aluminum metal, as an abrasive owing to its hardness, and as a refractory material owing to its high melting point**

- **8- What is the most important characteristics of composites? (Ch 2-Slide 50)**
- **Ans: Having high-strength to weight ratio**

- **9- Material selection is based on their (Ch 3-Slide 3)**
- **Ans: Properties**

- **10 Name five chemical and five physical properties of engineering materials. (Ch 3-Slide 5)**

- **Ans:**

