Engineering material homework 1

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Question 1: Substances of which something is made or composed of.

Ceramic, PVC, polyethylene, polypropylene,

Titanium, aluminum, steel, magnesium;

Question 2: 1. Metallic: Good thermal, conductive;

Strong and ductile at room temperature;

Many maintain good strength at high temperature;

2. Polymeric: Strength and ductility varies;

Some are excellent insulators;

Low densities;

Relatively low softening or decomposition temperature;

3. Ceramic: High-hardness;

High-temperature strength;

Good heat and wear resistance;

Reduced friction;

Tend to brittle;

4. Composite: The components don't dissolve in each other;

The constituents keep their properties;

Consist of selected filter or reinforcing materials and a compatible resin binder;

5. Electronic: Modified silicon is used to change its electrical properties;

Question 3: Systems at micrometer size scale that use smart materials and devices to sense, communicate and actuate.

Mems microphones are used in portable devices, such as mobile phone, headset and laptop;

Accelerometers based on mems are used to sense orientation, coordinate acceleration, vibration, shock;

Question 4: Using the combined knowledge of materials from material science and material engineering enables engineers to convert materials into the products needed by society.

On the individual view, the knowledge would empower them to do their work more effectively.

Question 5: Due to the vast amount of the existing materials and the rapid growth in materials' total amount, specific categorization can be helpful for recognizing different materials as well as their characteristics.

In material science and related fields, specific categorization can lead to more accurate researches.