Tutorial 1
Engineering Materials
PROC2097

1. **For each of the following classes of materials, give two specific examples that are a regualr part of your life. (a) Metals (b) ceramics (c) polymers (d) semi-conductors. Specify the object that each materials is found in and explain why the material is used in each specific application.**

2. **Describe the enabling material property of each of the following and why it is so-**

   (a) Silica tiles for space shuttle
   (b) Steel for I beam in skyscrapers
   (c) Cobalt Chrome Molybdenum alloy for hip implants
   (d) Polycarbonate for eye glass lenses
   (e) Bronze for sculptures

3. **You would like to design an aircraft that can be flown by human power non-stop for 30 km. What type of materials properties would you recommend? What materials might be appropriate?**

4. **The Hull of the space shuttle consists of ceramic tiles bonded to an aluminum skin. Discuss the design requirement of the shuttle hull that led to the use of this combination of materials. What problems in producing the hull might the designers and manufacturers have faced?**

5. **You would like to physically separate different materials in a scrap recycling plant. Describe some possible methods that might be used to separate materials such as polymers, aluminum alloys and steels from one another.**

Reference: Askeland, D., Wright, W., Bhattacharya, D., & Chhabra, R. (2017). The science and engineering of materials (Seventh edition SI edition.). Cengage Learning. Chapter 18: Construction Materials.