

# Materials Science Essentials

Materials Science · Answer Key · 9 Questions

---

**1. In metallic bonding, what term describes the behavior of valence electrons?**

- A) Locked in ionic bonds
- B) Shared in covalent pairs
- C) A 'sea' of delocalized electrons**
- D) Transferred permanently to non-metals

**2. Bronze is an alloy traditionally composed of which two primary chemical elements?**

- A) Iron and Carbon
- B) Copper and Tin**
- C) Zinc and Lead
- D) Aluminium and Magnesium

**3. Which type of polymer can be repeatedly melted, reshaped, and hardened by cooling?**

- A) Thermosetting polymer
- B) Ceramic polymer
- C) Thermoplastic polymer**
- D) Crystalline polymer

**4. The Mohs scale is used to determine which specific property of a material?**

- A) Electrical conductivity
- B) Scratch resistance**
- C) Melting point
- D) Magnetic flux

**5. In reinforced concrete, why is steel rebar added to the mixture?**

- A) To decrease the weight
- B) To prevent chemical oxidation
- C) To increase tensile strength**
- D) To lower the melting point

**6. Nitinol, a 'shape memory alloy' used in medical stents, is primarily composed of which two metals?**

- A) Nickel and Titanium**
- B) Gold and Silver
- C) Iron and Copper
- D) Aluminium and Zinc

**7. Which element is the primary semiconductor used in the manufacturing of modern microchips?**

- A) Gallium
- B) Silicon**
- C) Carbon
- D) Germanium

**8. What is a common characteristic of most ceramic materials?**

- A) High ductility
- B) High electrical conductivity
- C) High melting points and brittleness**
- D) High flexibility

**9. What is the name of the process where iron reacts with oxygen and moisture to form rust?**

- A) Polymerization
- B) Oxidation**
- C) Galvanization
- D) Distillation