1. Amorphous solids are composed of atoms or molecules
   A) that are randomly arranged, with no structure or pattern.

2. Crystalline solids are composed of atoms or molecules
   B) arranged in an orderly, structured, and repeatable fashion.

3. Table salt is a compound with the chemical formula NaCl, which means there is one sodium atom for every atom of chlorine.
   A) It is crystalline, with the sodium and chlorine atoms stacked alternately on a three-dimensional lattice.

4. You are looking at x-ray diffraction patterns. Your lab partner insists that two very different patterns both belong to the same aluminum sample.
   C) If one pattern is aluminum, the other cannot be aluminum, or any other material with a face-centered structure.

5. You are looking at x-ray diffraction patterns. Your lab partner insists that two similar patterns both belong to the same aluminum sample.
   B) Aluminum has a face-centered structure; the other similar pattern may be aluminum, but may also be nickel, which has the same face-centered crystal structure.

6. Aluminum and iron are both crystalline metals. This means that
   B) both have long-range order, but they do not necessarily have the same pattern of stacking the atoms.

7. Are polymers crystalline or amorphous solids?
   C) Sort of both. Chains of molecules create short-range order, but the chains are tangled, preventing the establishment of long-range order.

8. An inelastic object (like clay or putty) is stretched slightly and released.
   B) It will remain stretched. You have done permanent damage to the object.

9. An elastic object (like a rubber band or a spring) is stretched slightly and released.
   C) The elastic object will return to its original shape as soon as it is released.

10. Which of the following is true about elasticity?
    B) It is possible to permanently stretch an elastic material; you can see the permanent damage when you release the object and it does not regain its original shape.

11. According to Hooke's Law, the amount an elastic material will stretch
    B) is directly proportional to the force applied.

12. A spring stretches by 2 cm when 100 g of mass is hung from it. When 300 g are hung from the spring, the stretch will be closest to
    A) 1 cm
    B) 2 cm
    C) 3 cm
    D) 4 cm
    E) 6 cm

13. A spring stretches by 4 cm when a 6 N force is applied. When you apply only 3 N of force
    A) the stretch is 2 cm.

14. A spring stretches by 2 cm when a 4 N force is applied. When you apply 8 N of force,
    C) the stretch is 4 cm.

15. As you add mass to the hanger, one lab partner measures the stretch of the spring while another plots the data. He notices that the first four points look linear, but the two after that don’t fall on or near the line. You immediately remove all the mass from the hanger, and
    B) you see several coils that are deformed; the spring has been permanently damaged.

16. A 5-ft woman weighing 100 lb is subjected to a mysterious alien grow-ray. She suddenly grows to twice her original height. At 10 feet tall, her new weight is closest to
    A) 100 lb!
    B) 200 lb!
    C) 400 lb!
    D) 600 lb!
    E) 800 lb!

17. The definition of density is
    B) mass per volume.

18. You have two beakers of water. One holds 10 g of water, and the other holds 100 g.
    C) The density of the water is the same for either beaker.
19. The density of iron is 8 g/cm$^3$. How massive is an iron cube that measures 2cm on each side? Assume the cube is perfectly shaped.
   A) 4 g  B) 8g  C) 16g  D) 32g  E) 64g

20. The density of aluminum is 3 g/cm$^3$. How massive is an aluminum cube that measures 2 cm on each side? Assume the cube is perfectly shaped.
   A) 0.375 g  B) 1.5g  C) 6g  D) 24 g

21. The density of water is
   A) 1 g/cm$^3$. When water freezes, though, its density decreases.

22. Osmium (Os) has a greater density than platinum (Pt). This is because
   B) osmium has a lower atomic weight than platinum, but it occupies less volume, making it denser.