

The test will mainly focus on material in Chapters 1-3. Study your lecture notes, and homework assignments. Expect to solve problems. Test yourselves by doing problems similar to the homework under time constraints. **MAKE SURE YOU BRING SCANTRONS.** You will be responsible for pages 1-93 of the text.

The following sample questions are meant to get you started in review and to touch on topics covered in these chapters. The actual exam will most likely be multiple choice.

TRUE OR FALSE:

Chapter 1:

- 1) Scientific results must be verified by constructing believable theories.
- 2) A rock weighs 12 lbs on earth. On the moon, where gravity is 1/6 that of earth, the rock would weigh 2 lbs.
- 3) A chemical property of sulfur is that it is yellow.
- 4) A solid is the state which has a definite volume and indefinite shape.
- 5) The element boron, B, is a metal.
- 6) The energy due to the motion of an object is its potential energy.
- 7) A meter is slightly shorter than a yard.
- 8) The prefix nano means 10^{-9} .
- 9) The freezing point of water is 273 K.
- 10) 180°F is the same as 72°C.
- 11) It takes 600 calories of heat to raise the temperature of 15 g of water from 15°C to 55°C.
- 12) The density of gold is 19.3 g/cm³. The volume of a 2.00 g of gold is 1.04 cm³.
- 13) The vaporization of liquid mercury is an example of a physical change.
- 14) The capacity to do work is called kinetic potential.
- 15) There are 20 mLs in 0.2 L.
- 16) Saltwater (after it is adequately filtered) is a good example of homogeneous mixture.
- 17) There are 3 significant figures in 0.00300 mLs.

Chapter 2:

- 1) Neutrons have almost no mass (in amu) and no charge.
- 2) The fact that 2 different elements may have atoms with the same atomic mass violates Dalton's atomic theory.
- 3) Deuterium differs from hydrogen in the number of protons it has.
- 4) In the quantum mechanical model of the atom, electrons are confined to charge clouds known as "energy levels".
- 5) The number of valence electrons in sulfur (₁₆S) is 16.
- 6) The electron configuration of ₂₃V is: $1s^2 2s^2 2p^6 3s^2 3p^6 3d^5$
- 7) There are 25 neutrons in ₂₃⁵⁰V²⁺.
- 8) Br⁻ has more valence electrons than Sr²⁺.
- 9) He is a nonmetal.
- 10) Alkali metals have s¹ valence electrons.
- 11) The identity of an element is determined by its atomic mass number.
- 12) Iron (Fe) is not an alkaline earth metal.
- 13) Ionization energy is the energy change that occurs when an electron is added to a neutral gaseous atom.
- 14) The element with the largest atomic radius is F.
- 15) Silver is a halogen.

Chapter 3:

- 1) The bromide ion is Br²⁺.
- 2) SCl₂ has ionic bonds.
- 3) O₂ is a substance which is made up of polar covalent molecules.
- 4) The correct Lewis structure for CaS has a double bond.
- 5) The correct electron dot structure for HCN is H:C::N: .
- 6) N is an element which is known to violate the octet rule.
- 7) The hydrogen phosphate ion is H₃PO₃⁻.
- 8) The ammonium ion is NH₄⁻.
- 9) Magnesium sulfate is MgSO₄.
- 10) The correct formula for the potassium ion is P⁺.
- 11) In the compound LiCl, the atoms are held together by polar covalent bonds.
- 12) The following substance is polar: CO₂.
- 13) The atoms of F₂ are held together by nonpolar covalent bonds.
- 14) The atoms of carbon monoxide are held together by double bonds.
- 15) The geometric shape of ammonia (NH₃) is tetrahedral according to the VSEPR model.
- 16) H₂O is an example of a bent molecule according to VSEPR.

- 17) The simplest stable compound of nitrogen with chlorine is NCl_2 .
- 18) The charge of P in Al_2P_3 is -3.