

Name: \_\_\_\_\_ Period: \_\_\_\_\_ Date: \_\_\_\_\_

## Chapter 11 Test 2012-2013

All questions are worth one point each

**Multiple Choice** - Identify the letter of the choice that best completes the statement or answers the question.

- \_\_\_\_\_ 1. Carbon-14 forms Nitrogen-14 by
- a. gamma decay.
  - b. alpha decay.
  - c. beta decay.
  - d. none of the above
- \_\_\_\_\_ 2. During nuclear \_\_\_\_\_, great amounts of energy are produced from very small amounts of mass.
- a. fission
  - b. excitation
  - c. expansion
  - d. transfiguration
- \_\_\_\_\_ 3. When U-235 splits, it usually emits
- a. no particles at all.
  - b. three neutrons.
  - c. many electrons.
  - d. many protons.
  - e. one neutron.
- \_\_\_\_\_ 4. In general, the nucleus of a small atom is stable. In this kind of atom, \_\_\_\_\_
- a. the strong nuclear force is **much weaker** than the electric force.
  - b. the strong nuclear force is **much greater** than the electric force.
  - c. the strong nuclear force **equals** the electric force.
  - d. the strong nuclear force and the electric force are **both attractive**.
- \_\_\_\_\_ 5. When Uranium (92 protons) emits an alpha particle, the nucleus left behind has
- a. 92 protons.
  - b. 89 protons.
  - c. 88 protons.
  - d. 91 protons.
  - e. 90 protons.
- \_\_\_\_\_ 6. The half-life of a radioactive material is the amount of time it takes for
- a. all the sample to decay.
  - b. half the sample to decay into something else.
  - c. the age of an artifact to be calculated.
  - d. detectable radiation to be absorbed by a sample.
- \_\_\_\_\_ 7. The type of radiation that will penetrate farthest into a material is
- a. a beta particle.
  - b. an alpha particle.
  - c. a gamma ray.
  - d. They all penetrate material the same distance.
- \_\_\_\_\_ 8. When radium-226 decays to form radon-222, the radium nucleus emits a(an)
- a. alpha particle.
  - b. gamma ray.
  - c. beta particle.
  - d. electron.

- \_\_\_\_\_ 9. The **atomic number** of an atom or ion refers to the number of
- neutrons, protons, and electrons
  - neutrons.
  - protons.
  - electrons.
- \_\_\_\_\_ 10. Radioactivity is the process in which an unstable atomic nucleus emits \_\_\_\_\_ or energy
- light
  - heat
  - charged particles
  - sound
- \_\_\_\_\_ 11. Which radiation has **no charge**?
- alpha
  - gamma
  - beta
- \_\_\_\_\_ 12. The force that holds the nucleus **together** is the
- gravitational force.
  - strong nuclear force.
  - electric force.
  - nucleonic force.
- \_\_\_\_\_ 13. The half-life of Iodine-131 is 5 years. After about 15 years, how much of a sample of will be left?
- |                   |                  |
|-------------------|------------------|
| a. $\frac{1}{10}$ | c. $\frac{1}{2}$ |
| b. $\frac{1}{4}$  | d. $\frac{1}{8}$ |
- \_\_\_\_\_ 14. The discovery of radioactivity by Henri Becquerel involved a \_\_\_\_\_
- |                   |                   |
|-------------------|-------------------|
| a. Geiger counter | c. Bubble chamber |
| b. Piece of film  | d. Electroscope   |
- \_\_\_\_\_ 15. Many people work near a source of nuclear radiation. To measure the amount of exposure they personally have to radiation **over a long time**, they most likely will use a
- |                   |                 |
|-------------------|-----------------|
| a. Flux Capacitor | c. lead shield. |
| b. radon kit.     | d. dosimeter.   |
- \_\_\_\_\_ 16. Transmutation is a radioactive decay that changes the \_\_\_\_\_ in the nucleus.
- number of electrons
  - number of protons
  - number of neutrons
- \_\_\_\_\_ 17. Uranium-235, Uranium-238, and Uranium-239 are all different
- isotopes.
  - ions.
  - elements.
  - none of the above



29. A sample of a radioisotope had a mass of 200.0 g. After exactly 40 days, 12.5 g of the sample remained. The half-life of the isotope is \_\_\_\_\_ days.

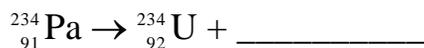
### Matching

- |                      |                   |
|----------------------|-------------------|
| a. cosmic rays       | f. Geiger counter |
| b. 5730 years        | g. Curie          |
| c. alpha             | h. gamma          |
| d. 4.5 Billion years | i. Cyclotron      |
| e. beta              |                   |

- \_\_\_\_ 30. Source of background radiation  
\_\_\_\_ 31. Radiation that emits a high energy wave  
\_\_\_\_ 32. Radiation that emits an electron  
\_\_\_\_ 33. Device that measures radiation  
\_\_\_\_ 34. Radiation that emits a Helium particle

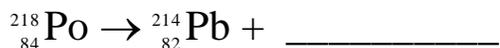
### Short Answer

35. Alpha-emitting substances, such as radon gas, can be a serious health hazard only if they are \_\_\_\_\_ or \_\_\_\_\_
36. In terms of **forces**, when does a nucleus become radioactive? (Your answer must include forces)
37. Balance the following nuclear equation



### Other

38. What type of nuclear radiation completes the following decay equation?



39. What type of nuclear radiation completes the following decay equation?

