

Name: \_\_\_\_\_  
Radioactivity

1. In radioactive decay, what is half-life?

The time taken for the radioactivity of a specified isotope to fall to half its original value.

2. How does carbon-14 dating work? is it useful in dating all ancient artifacts?

The concentration of C-14 in a living system is constant because it is constantly being created in the atmosphere by the interaction of cosmic rays with atmospheric nitrogen. The resulting C-14 is incorporated into CO<sub>2</sub> which is later taken by plants; animals then acquire C-14 by eating the plants. When the animal or plant dies, it stops exchanging carbon with its environment, and from that point onwards the amount of C-14 begins to decrease. as the 14. We know the half-life of C-14 and we can use it to calculate when the animal or plant stopped consuming C-14.

Not all

- 3) Which of the following statements best describes the *strong nuclear force*?

A) The strength of the force increases with distance.  
B) The force is very strong and works over very long distances.  
**C)** The force is very strong but has a very short range.  
D) The electrical force is stronger than the nuclear force.  
E) The force has two sides: the light side and the dark side.

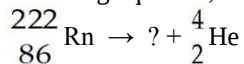
- 4) Which of the following statements best describes why a large nucleus is more likely to undergo radioactive decay?

A) The nuclear force between the nucleons are very strong and squeeze out other nucleons.  
**B)** The nuclear forces are not as strong as the repulsive electrical forces between nucleons.  
C) All nuclei are equally likely to undergo radioactive decay.  
D) The proton-proton repulsion cannot overcome the nucleon attraction.  
E) The nucleon-nucleon attraction is stronger than the proton-proton repulsion.

- 5) Radium-226 decays by alpha emission to \_\_\_\_\_.

A) barium-131    B) cobalt-60    C) carbon-14    D) polonium-218    **E) radon-222**

- 6) According to the following equation, radon decays into what atom?



A)  ${}_{84}^{226}\text{Po}$     B)  ${}_{86}^{308}\text{Rn}$     **C)  ${}_{84}^{218}\text{Po}$**     D)  ${}_{88}^{308}\text{Ra}$     E)  ${}_{88}^{226}\text{Ra}$

- 7) The product from the alpha decay of  ${}_{92}^{235}\text{U}$  is \_\_\_\_\_.

A)  ${}_{93}^{235}\text{Np}$     B)  ${}_{94}^{239}\text{Pu}$     **C)  ${}_{90}^{231}\text{Th}$**     D)  ${}_{80}^{233}\text{Ra}$     E)  ${}_{92}^{236}\text{U}$