Name **Date**

Half-Life Practice Questions

1. Based on Reference Table *N*, what fraction of a radioactive ^{90}Sr sample would remain unchanged after 56.2 years?

   A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{1}{16}$

2. How many days are required for 200. grams of radon-222 to decay to 50.0 grams?

   A) 1.91 days B) 3.82 days
   C) 7.64 days D) 11.5 days

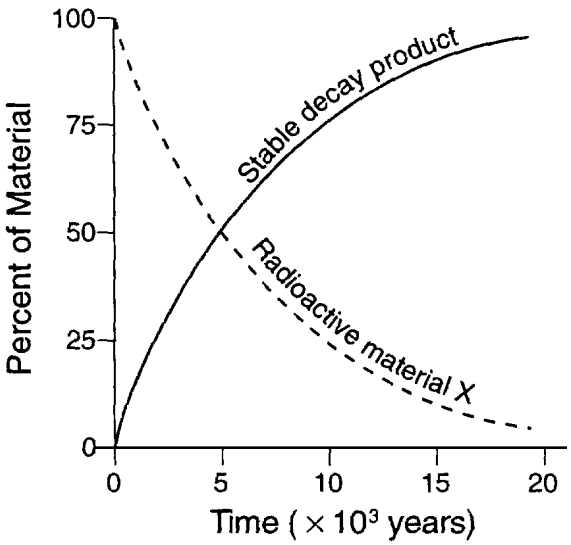
3. Based on Reference Table *N*, what fraction of a sample of gold-198 remains radioactive after 2.69 days?

   A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) $\frac{3}{4}$ D) $\frac{7}{8}$

4. According to Table *N*, which radioactive isotope is best for determining the actual age of Earth?

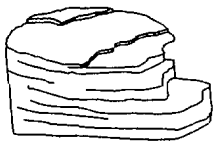
   A) ^{238}U B) ^{90}Sr C) ^{60}Co D) ^{14}C

5. Base your answer to the following question on on the graph below. The graph represents the decay of radioactive material *X* into a stable decay product.



Each of the objects below has different amounts remaining of the original radioactive material *X*. Which object is most likely the oldest?

A)



Rock

10% of the radioactive material remains

B)

Wood

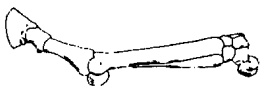
33% of the radioactive material remains

C)

Shell

41% of the radioactive material remains

D)



Bone

52% of the radioactive material remains

6. Exactly how much time must elapse before 16 grams of potassium-42 decays, leaving 2 grams of the original isotope?

   A) 8 × 12.4 hours B) 2 × 12.4 hours
   C) 3 × 12.4 hours D) 4 × 12.4 hours

7. As a sample of the radioactive isotope ^{131}I decays, its half-life

   A) decreases B) increases
   C) remains the same

8. The half-life of a radioactive substance is 2.5 minutes. What fraction of the original radioactive substance remains after 10 minutes?

   A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{1}{16}$

9. Approximately what fraction of an original Co–60 sample remains after 21 years?

   A) $\frac{1}{2}$
   B) $\frac{1}{4}$
   C) $\frac{1}{8}$
   D) $\frac{1}{16}$

10. The half-life of ^{131}I is 8.07 days. What fraction of a sample of ^{131}I remains after 24.21 days?

    A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $\frac{1}{16}$

11. What was the original mass of a radioactive sample that decayed to 25 grams in four half-life periods?

    A) 50 g B) 100 g C) 200 g D) 400 g

12. What mass of a 60.0-gram sample of ^{16}N will remain unchanged after 28.8 seconds?

    A) 3.75 g B) 7.50 g
    C) 15.0 g D) 30.0 g

13. What is the number of half-life periods required for a sample of a radioactive material to decay to one-sixteenth its original mass?

    A) 8 B) 16 C) 3 D) 4

14. Compared to ^{37}K, the isotope ^{42}K has a

    A) shorter half-life and the same decay mode
    B) shorter half-life and a different decay mode
    C) longer half-life and the same decay mode
    D) longer half-life and a different decay mode

15. Which radioisotopes have the same decay mode and have half-lives greater than 1 hour?

    A) Au-198 and N-16 B) Ca-37 and Fe-53
    C) I-131 and P-32 D) Tc-99 and U-233