

1. Which of the following is a product of α -decay of uranium-238?

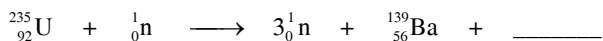
- a) $^{234}_{90}\text{Th}$
- b) $^{238}_{91}\text{Np}$
- c) $^{238}_{91}\text{Pa}$
- d) $^{235}_{92}\text{U}$
- e) $^{242}_{94}\text{Pu}$

2. What is the missing product in the following nuclear transmutation equation?



- a) $^{46}_{22}\text{Ti}$
- b) $^{46}_{21}\text{Sc}$
- c) $^{44}_{22}\text{Ti}$
- d) $^{42}_{18}\text{Ar}$

3. What nuclide product is necessary to balance the following fission reaction?



- a) $^{96}_{35}\text{Br}$
- b) $^{96}_{36}\text{Kr}$
- c) $^{94}_{37}\text{Rb}$
- d) $^{94}_{36}\text{Kr}$
- e) $^{90}_{38}\text{Sr}$

4. Electron capture transforms ^7Be into what nuclide?

- a) ^6Li
- b) ^7B
- c) ^7Li
- d) ^6B
- e) ^{12}C

5. ^{32}P radioactively decays by beta emission. Its half-life is 14.3 days. How long would it take for 90% of a given sample of ^{32}P to decay?

- a) 69.1 days
- b) 51.7 days
- c) 42.3 days
- d) 47.5 days

6. A sample of wood from an Egyptian mummy case has a carbon-14 activity of 9.4 disintegrations per minute per gram of carbon (d/min·g). How old is the wood?

(Given: the ratio of $^{12}\text{C} : ^{14}\text{C}$ in living organisms results in a specific activity of 15.3 d/min·g, and the half-life of ^{14}C is 5730 years.)

- a) 6400 yr
- b) 4570 yr
- c) 4030 yr
- d) 3420 yr
- e) none of these

Answers:

- 1. a
- 2. b
- 3. d
- 4. c
- 5. d
- 6. c