

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

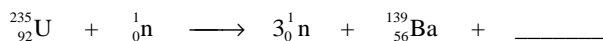
- a) ^{234}Th
- b) ^{238}Np
- c) ^{238}Pa
- d) ^{235}U
- e) ^{242}Pu

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. The mass of a proton is 1.00728 amu and that of a neutron is 1.00867 amu. What is the binding energy (in J/nucleon) of a $^{60}_{27}\text{Co}$ nucleus? (The mass of a cobalt-60 nucleus is 59.9338 amu.)

- a) 1.368×10^{-12}
- b) 3.039×10^{-12}
- c) 2.487×10^{-12}
- d) 9.432×10^{-13}
- e) 7.009×10^{-14}

Answers:

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