

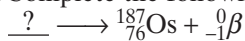


# Standardized Test Prep

Answer the following items on a separate piece of paper.

## MULTIPLE CHOICE

1. Complete the following nuclear equation:



- A.  ${}^{187}_{77}\text{Os}$
  - B.  ${}^{187}_{75}\text{Os}$
  - C.  ${}^{187}_{77}\text{Ir}$
  - D.  ${}^{187}_{75}\text{Re}$
2. The mass of the nucleus is
- A. greater than the mass of the protons and neutrons that make up the nucleus.
  - B. equal to the mass of the protons and neutrons that make up the nucleus.
  - C. less than the mass of the protons and neutrons that make up the nucleus.
  - D. converted to energy.
3. Which type of radiation has the most penetrating ability?
- A. an alpha particle
  - B. a beta particle
  - C. a gamma ray
  - D. a neutron
4. Which two particles have the same mass but opposite charge?
- A. a beta particle and a positron
  - B. a neutron and a proton
  - C. a proton and an electron
  - D. an alpha particle and a proton
5. Which of the following nuclear equations is correctly balanced?
- A.  ${}^{37}_{18}\text{Ar} + {}^0_{-1}e \longrightarrow {}^{37}_{17}\text{Cl}$
  - B.  ${}^6_3\text{Li} + 2{}^1_0n \longrightarrow {}^4_2\text{He} + {}^3_1\text{H}$
  - C.  ${}^{254}_{99}\text{Es} + {}^4_2\text{He} \longrightarrow {}^{258}_{101}\text{Md} + 2{}^1_0n$
  - D.  ${}^{14}_7\text{N} + {}^4_2\text{He} \longrightarrow {}^{17}_8\text{O} + {}^2_1\text{H}$
6. Gamma rays
- A. have the same energy as beta particles do.
  - B. are visible light.
  - C. have no charge and no mass.
  - D. are not a form of electromagnetic radiation.

7. Which of the following nuclides is radioactive?

- A.  ${}^{40}_{20}\text{Ca}$
- B.  ${}^{226}_{88}\text{Ra}$
- C.  ${}^{12}_6\text{C}$
- D.  ${}^{206}_{82}\text{Pb}$

8. The half-life of thorium-234 is 24 days. If you have a 42.0 g sample of thorium-24, how much will remain after 72 days?

- A. 42.0 g
- B. 21.0 g
- C. 10.5 g
- D. 5.25 g

9. It takes 5.2 min for a 4.0 g sample of francium-210 to decay until only 1.0 g is left. What is the half-life of francium-210?

- A. 1.3 min
- B. 2.6 min
- C. 5.2 min
- D. 7.8 min

## SHORT ANSWER

10. Write the nuclear equation that represents the process in which a neutron in the nucleus is changed to a proton with the emission of a beta particle.

11. Describe a positron, and write its nuclear symbol.

## EXTENDED RESPONSE

12. Explain the difference between nuclear fission and nuclear fusion, and explain the energy changes that accompany each process.

13. What is meant by the term *mass defect*?

## Test TIP

Keeping a positive attitude during any test will help you focus on the test and likely improve your score.