

- 1) **D** Iron-56 is a special isotope because:
- A) Its atomic mass is exactly 56 atomic mass units.
 - B) It is impossible to split this isotope.
 - C) It is impossible to create any nuclear reactions using this isotope.
 - D) It is impossible to extract any energy from this isotope.
 - E) It has an exceptionally long half-life.
- 2) **E** Neutrons normally initiate nuclear fission reactions because:
- A) They are massive, and can excite a nucleus if absorbed.
 - B) They can approach a nucleus even if they are moving slowly.
 - C) The strong force easily pulls them in.
 - D) Their lifetime is long compared to the speed of nuclear reactions.
 - E) All of the above.
- 3) **D** The critical mass of (let us say) a sphere of plutonium-239 depends on:
- A) the radius of the sphere.
 - B) the density of the sphere.
 - C) the purity of the Pu-239.
 - D) All of the above (A – C).
 - E) None of the above (A – C).
- 4) **B** When uranium-235 fissions, it tends to:
- A) Split into two equal parts.
 - B) Split into two fragments with $A = 140$ and $A = 95$.
 - C) Shatter into three or more fragments.
 - D) Decay into thorium.
 - E) Become less radioactive.
- 5) **B** So-called “spent” uranium is:
- A) Not radioactive.
 - B) Uranium metal totally depleted of U-235.
 - C) Uranium metal totally depleted of U-238.
 - D) Actually a mixture of uranium and plutonium.
 - E) None of the above.