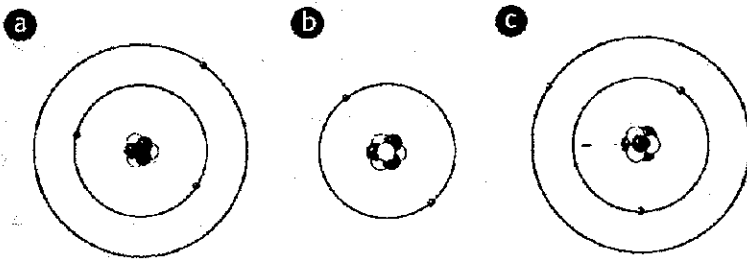


17. Study the models below, and answer the questions that follow:



Key

- Proton
- Neutron
- Electron

- a. Which models represent isotopes of the same element? *A + C*
- b. What is the atomic number for (a)? *3*
- c. What is the mass number for (b)? *7*

- C 18. The process in which the nucleus of a radioactive atom releases nuclear radiation is
- a. nuclear decay.
 - b. activation energy.
 - c. radioactive decay.
 - d. radioactivity.

- D 19. How does a nucleus become stable?
- a. It emits gamma rays.
 - b. It emits alpha particles.
 - c. It emits beta particles.
 - d. all of the above

- C 20. The process in which a large nucleus splits into two smaller nuclei with the release of energy is
- a. gamma decay.
 - b. alpha decay.
 - c. nuclear fission.
 - d. nuclear fusion.

- B 21. Atomic nuclei emit radiation in order to
- a. achieve atomic decay.
 - b. achieve a stable number of protons and neutrons.
 - c. go through one or more half-lives.
 - d. None of the above

- C 22. Protons push away from one another in the nucleus because of the
- a. gravitational force.
 - b. electromagnetic force.
 - c. strong force.
 - d. weak force.

- D 23. The _____ plays a key role in radioactive decay in which a neutron changes into a proton and an electron.
- a. gravitational force
 - b. electromagnetic force
 - c. strong force
 - d. weak force

24. Particle accelerators are devices that speed up charged particles in order to smash them together. Sometimes the result of the collision is a new nucleus. How can scientists determine whether the nucleus formed is that of a new element or that of a new isotope of a known element?

Scientists can determine if the nucleus formed is a new element by comparing the atomic # (number of p^+) to known elements of the periodic table. If it is a new atomic number then it is a new element. If it has the same atomic # as a previously known element, they have created an isotope.