

**13.3** When a nucleus in an atom undergoes a radioactive decay, the electronic energy levels of the atom

- (a) do not change for any type of radioactivity .
- (b) change for  $\alpha$  and  $\beta$  radioactivity but not for  $\gamma$ -radioactivity.
- (c) change for  $\alpha$ -radioactivity but not for others.
- (d) change for  $\beta$ -radioactivity but not for others.

As an alpha particle carries 2 units of positive charge, and a beta particle carries one unit of negative charge and  $\gamma$ (particle) carries no charge, therefore, electronic energy levels of the atom change for  $\alpha$  and  $\beta$  decay, but not for  $\gamma$ -particle. Choice (b) is correct.