

### Question:

Carbon is the 6th element in the periodic table. How many electrons are there in the outer shell of a  $C^{++}$  ion?

- (A) 12
- (B) 2
- (C) 4
- (D) 6
- (E) 8

### Question:

Carbon is the 6th element in the periodic table. How many neutrons are there in a nucleus of the isotope  $^{14}\text{C}$ ?

- (A) 12
- (B) 2
- (C) 4
- (D) 6
- (E) 8

### Question:

Which of the following nuclei is the easiest to disintegrate?

- (A) High binding energy
- (B) *Low binding energy*
- (C) Depends on the number of  $n$  and  $p$
- (D) Depends on the specific element and its isotope

### Question:

Starting with an amount of  $N_0$  of a radioactive sample, after how much time are we left with  $N_0/e$ ? ( $\lambda$  is the decay rate)

- (A)  $\lambda$
- (B)  $1/\lambda$
- (C)  $\lambda/e$
- (D)  $\lambda/2$
- (E) Need more information

### Question:

The cobalt isotope  $^{60}\text{Co}$  ( $Z = 27$ ) decays to the nickel isotope  $^{60}\text{Ni}$  ( $Z = 28$ ). The process is

- (A)  $\alpha$  decay
- (B)  $\beta$ -minus ( $e^-$ ) decay
- (C)  $\beta$ -plus ( $e^+$ ) decay
- (D)  $\gamma$  decay