

## Period 11 Exercise Answers

**E.1 Comparing alpha and beta radiation of the same energy,**

- a) alpha is more ionizing and more penetrating.
- b) alpha is more ionizing and less penetrating.
- c) alpha is less ionizing and more penetrating.
- d) alpha is less ionizing and less penetrating.
- e) alpha and beta have the same ionizing and penetrating ability.

**E.1 = b**

**E.2** In 1990, a radioactive sample was observed to decay at a rate of 800 counts per minute. In 2002, that same sample was observed to decay with a rate of 100 counts per minute. What is the half-life of the material in the sample?

- a) 2 years
- b) 4 years
- c) 6 years
- d) 8 years
- e) 12 years

Year	Count rate
1990	800/min
1994	400/min
1998	200/min
2002	100/min

**E.2 = b**

**E.3** A student measured the radioactive particles given off by a Barium-137 source. In the experiment, the count rate fell from 280 counts per minute to 35 counts per minute in some time interval  $t$ . The half-life of Ba-137 is about 2.6 minutes. How long was the time interval  $t$ ?

- a) 2.6 minutes
- b) 5.2 minutes
- c) 7.8 minutes
- d) 10.4 minutes
- e) You would need to know the mass of the Ba-137 to find the answer.

<b>Time</b>	<b>Count rate</b>
now	280/min
1 half life	140/min
2 half lives	70/min
3 half lives	35/min
3 half lives	$x \frac{2.6 \text{ min}}{\text{half life}} = 7.8 \text{ min}$

**E.3 = c**

## **E.4 Ionizing radiation**

- a) can cause cancer**
- b) can be used to diagnose cancer.**
- c) can be used to treat cancer.**
- d) Answers a) and c) are both true.**
- e) All of the above answers are true.**

**E.4 = e**

**E.5** Which of the following is NOT a source of ionizing radiation?

- a) cosmic rays
- b) some types of rocks
- c) dental X-rays
- d) potassium in the body
- e) photographic film

**E.5 = e**

**E.6** Which of the following statements about radioactivity is FALSE?

- a) Radioactivity occurs naturally in nature.
- b) Radiation can cause biological damage.
- c) The distance from a radioactive source is important in determining the dose of radiation received.
- d) Exposure to background radiation from cosmic rays decreases with increasing altitude.
- e) The presence of radioactive substances can be detected by using a cloud chamber.

**E.6 = d**

## Period 11 Answers

**E.1 = b**

**E.2 = b**

**E.3 = c**

**E.4 = e**

**E.5 = e**

**E.6 = d**