

## Practice Quiz 6

- 1) You are a passenger on a spaceship. As the speed of the spaceship increases, you would observe
- A) the length of your spaceship getting shorter.
  - B) the length of your spaceship getting longer.
  - C) the length of your spaceship varying erratically.
  - D) nothing unusual about the length of your spaceship.

Answer: D

- 2) A spaceship, traveling at  $0.560c$  towards a stationary enemy station, shoots a projectile towards the station with a speed of  $0.100c$  relative to the spaceship. What is the speed of the projectile relative to the station?

- A)  $0.575c$
- B)  $0.600c$
- C)  $0.625c$
- D)  $0.660c$

Answer: C

- 3) Two spaceships approach Earth from the same direction. One has a speed of  $0.21c$  and the other a speed of  $0.34c$ , both relative to Earth. What is the speed of one spaceship relative to the other?

- A)  $0.13c$
- B)  $0.14c$
- C)  $0.15c$
- D)  $0.16c$

Answer: B

Diff: 1 Page Ref: Sec. 29-4

- 4) What is the relativistic momentum of a  $0.456\text{-kg}$  rest mass moving at  $1.20 \times 10^8 \text{ m/s}$ ?

- A)  $5.47 \times 10^7 \text{ kgXm/s}$
- B)  $5.57 \times 10^7 \text{ kgXm/s}$
- C)  $5.87 \times 10^7 \text{ kgXm/s}$
- D)  $5.97 \times 10^7 \text{ kgXm/s}$

Answer: D

- 5) The value of a wavelength in the Balmer series is  $374.9 \text{ nm}$ . What is the value of  $n$ ?

- A) 6
- B) 3
- C) 10
- D) 12

Answer: D

- 6) What is the wavelength associated with the electron in the  $n = 6$  state of hydrogen?

- A)  $2.99 \times 10^9 \text{ m}$
- B)  $3.11 \times 10^9 \text{ m}$
- C)  $3.99 \times 10^9 \text{ m}$
- D)  $1.99 \times 10^9 \text{ m}$

Answer: D

- 7) What is the kinetic energy of an electron in the  $n = 3$  Bohr orbit?

- A)  $2.71 \times 10^{19} \text{ J}$
- B)  $3.20 \times 10^{19} \text{ J}$
- C)  $2.42 \times 10^{19} \text{ J}$
- D)  $6.10 \times 10^{19} \text{ J}$

Answer: C