

Quiz 6

1) You are a passenger on a spaceship. As the speed of the spaceship increases, you would observe

- A) your watch slowing down.
- B) your watch speeding up.
- C) your watch losing time.
- D) nothing unusual about your watch.

Answer: D

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

- A) $0.460c$
- B) $0.487c$
- C) $0.492c$
- D) $0.660c$

Answer: B

3) Two spaceships approach Earth from opposite directions. 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) $0.51c$
- B) $0.55c$
- C) $0.58c$
- D) $0.61c$

Answer: A

4) At what speed is the mass of an electron double its rest mass?

- A) $0.500c$
- B) $0.707c$
- C) $0.866c$
- D) $0.960c$

Answer: C

5) What is the wavelength in the Balmer series corresponding to a value of $n = 15$?

- A) 277.1 nm
- B) 371.1 nm
- C) 188.6 nm
- D) 754.2 nm

Answer: B

6) An electron in the hydrogen atom has a wavelength of 2.67 nm. To what state of the hydrogen atom does this electron belong?

- A) $n = 2$
- B) $n = 5$
- C) $n = 8$
- D) $n = 11$

Answer: C

7) What is the radius of the smallest Bohr orbit?

- A) 2.14×10^9 m
- B) 1.12×10^9 m
- C) 3.17×10^{11} m
- D) 5.29×10^{11} m

Answer: D