

44. In his theory of special relativity, Einstein
- abandoned the Galilean principle of relativity.
 - abandoned Maxwell's equations for electricity and magnetism.
 - reconciled the apparent conflict between the Galilean principle of relativity and Maxwell's equations.
 - postulated the existence of an absolute reference system.
 - postulated that the speed of light is constant in vacuum, and the same in all inertial frames.
 - All of the above completions yield true statements.
 - None of the above.
45. The second postulate of special relativity does NOT require that the speed of light
- is a constant in a vacuum and equal to c .
 - is independent of the motion of the receiver.
 - is independent of the motion of the source.
 - is independent of the direction of propagation
 - In fact, the second postulate requires all of the above.
46. As a friend passed you at a very high speed, she reported that she simultaneously exploded a firecracker at each end of her skateboard. Which one exploded first from your point of view?
- the one at the front
 - the one at the back
 - They exploded simultaneously.
 - The answer depends on the speed of the skateboard.
 - None of the above is a correct answer to the question.
47. If inertial mass and gravitational mass were NOT the same,
- the law of universal gravitation would need to be modified.
 - Newton's second law would need to be modified.
 - objects with different masses falling in a vacuum near the earth's surface would no longer experience the same acceleration.
 - objects falling in a vacuum near the earth's would no longer experience a force proportional to their gravitational mass.
 - All of the above statements are true.
48. Superman wants to travel back to his native Krypton for a visit, a distance of 3×10^{13} meters. (At nearly the speed of light, it takes light nearly 10^5 seconds to travel this distance.) If Superman is able to hold his breath for 10^3 s and travel at any speed less than that of light, can he make it before he suffocates?
- Not unless he stops off for a breath on his way.
 - Not unless he goes faster than light.
 - No way.
 - Yes, because in his frame his biological clock slows down to give him more time
 - Yes because in his frame of reference the distance is contracted to a much smaller value.