

Name _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 1) Electrical forces inside a nucleus contribute nuclear
 - A) stability.
 - B) instability.**
 - C) both of these.
 - D) none of these.

- 2) Uranium-235, uranium-238, and uranium-239 are different
 - A) ions.
 - B) elements.
 - C) isotopes.**
 - D) none of these

- 3) Compared to the mass of a uranium nucleus before splitting, the pieces it splits into have
 - A) more mass.
 - B) the same mass.
 - C) less mass.**

- 4) In the fissioning of uranium, a chain reaction is caused by
 - A) ejected neutrons.**
 - B) the enormous energy release.
 - C) the kinetic energy of the decay products.
 - D) the conversion of mass to energy.
 - E) none of these

- 5) When a lump of uranium is broken into smaller pieces, the total surface area of the lump
 - A) increases.**
 - B) decreases.
 - C) remains the same.

- 6) Which will leak more neutrons, two separate lumps of uranium or the same two lumps stuck together?
 - A) the same two lumps stuck together
 - B) two separate lumps**
 - C) both the same

- 7) In a breeder reactor
A) uranium is converted into plutonium.
B) plutonium is converted into uranium.
C) both of these
D) neither of these
- 8) A nucleon has more potential energy with respect to a nucleus when it is
A) outside the nucleus.
B) inside the nucleus.
C) both the same
- 9) Between nuclear fission and nuclear fusion, radioactive by-products are more characteristic of nuclear
A) fission.
B) fusion.
C) both of these.
D) neither of these.
- 10) In both fission and fusion, mass
A) is created from energy of other forms.
B) remains the same.
C) is converted to kinetic energy.
- 11) According to the special theory of relativity, all laws of nature are the same in reference frames that
A) oscillate.
B) move at constant velocity.
C) accelerate.
D) move in circles.
E) none of these
- 12) Two lightning bolts are seen to strike two distant locations at the same time. Seen from a different location, the two lightning bolts
A) will also be seen at the same time.
B) may or may not be seen at the same time.
C) will not be seen at the same time.
- 13) You and a friend share the same spacetime when there is no
A) difference in your rate of heartbeats.
B) acceleration for either of you.
C) relative velocity between you.

- 14) The stretching out of time due to motion is called time
- A) expansion.
 - B) contraction.
 - C) stretching.
 - D) dilation.**
 - E) warp.
- 15) Compared to clocks in a stationary reference frame, clocks in a moving reference frame run
- A) at the same speed.
 - B) slower.**
 - C) faster.
- 16) Clocks on a spaceship moving very fast relative to the Earth run more slowly when viewed from
- A) the Earth.**
 - B) the spaceship.
 - C) both places.
 - D) neither place.
- 17) Harry takes a space voyage and returns to find his twin sister has aged more than he has. This is evidence that they have been in different
- A) realms of time.
 - B) frames of reference.
 - C) space times.
 - D) all of these**
 - E) none of these
- 18) A woman standing on the ground sees a rocket ship move past her at 95% of the speed of light. Compared to when the rocket is at rest, the woman measures the rocket's length as
- A) the same length.
 - B) shorter.**
 - C) longer.
- 19) According to Einstein's theory of special relativity
- A) energy and mass are aspects of each other.
 - B) space and time are aspects of each other.
 - C) both of these**
 - D) none of these
- 20) Relativity equations for time, length and momentum hold true for
- A) everyday low speeds.
 - B) relativistic speeds.
 - C) both of these**
 - D) none of these