

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