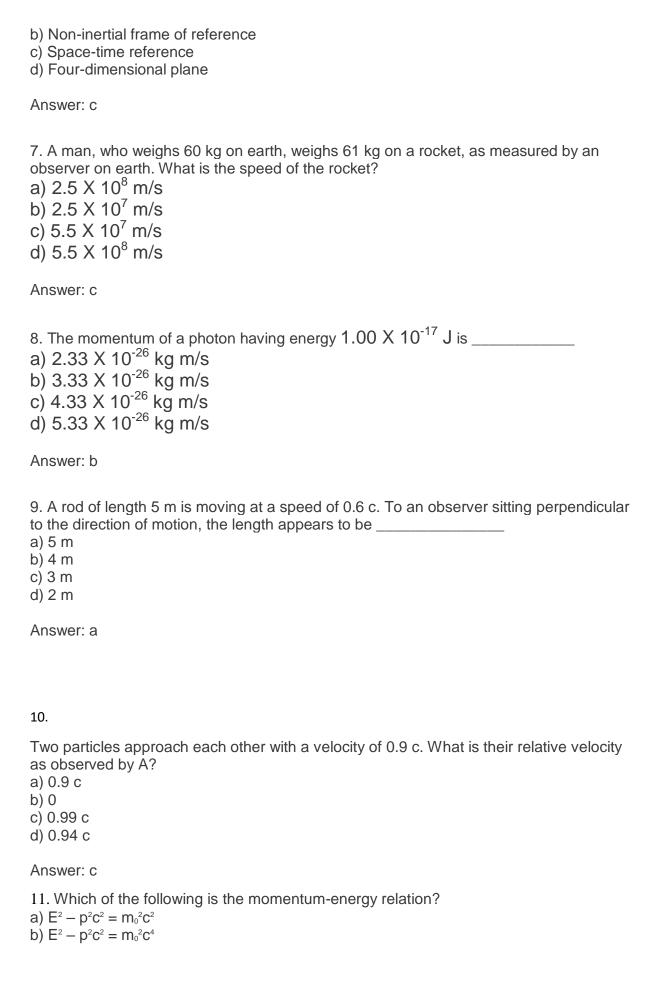1. As an object approaches the speed of light, it's mass becomes _____
a) Zero
b) Double
c) Remains Same
d) Infinite

Answer: d

2. If the sun radiates energy at the rate of 4×10^{26} Js^{-1}, what is the rate at which its mass is decreasing?

a) 5.54×10^9 kgs^{-1}
b) 4.44×10^9 kgs^{-1}
c) 3.44×10^9 kgs^{-1}
d) 2.44×10^9 kgs^{-1}

Answer: b

3. A rod of length 1m moves with a speed of 0.5 c. How much length contraction takes place?
a) 50 %
b) 14 %
c) 10 %
d) 35 %

Answer: b

4. According to Einstein's Special Theory of Relativity, laws of physics can be formulated based on _____
a) Inertial Frame of Reference
b) Non-Inertial Frame of Reference
c) Both Inertial and Non-Inertial Frame of Reference
d) Quantum State

Answer: a

5. For Einstein's relation, $E^2 - p^2c^2 = $ _____
a) m_0c^2
b) $m_0^2c^4$
c) m_0c^4
d) $m_0^2c^6$

Answer: b

6. A frame of reference has four coordinates, x, y, z, and t is referred to as the_____
a) Inertial frame of reference

b) Non-inertial frame of reference
c) Space-time reference
d) Four-dimensional plane

Answer: c

7. A man, who weighs 60 kg on earth, weighs 61 kg on a rocket, as measured by an observer on earth. What is the speed of the rocket?
a) 2.5×10^{8} m/s
b) 2.5×10^{7} m/s
c) 5.5×10^{7} m/s
d) 5.5×10^{8} m/s

Answer: c

8. The momentum of a photon having energy 1.00×10^{-17} J is _____
a) 2.33×10^{-26} kg m/s
b) 3.33×10^{-26} kg m/s
c) 4.33×10^{-26} kg m/s
d) 5.33×10^{-26} kg m/s

Answer: b

9. A rod of length 5 m is moving at a speed of 0.6 c. To an observer sitting perpendicular to the direction of motion, the length appears to be _____
a) 5 m
b) 4 m
c) 3 m
d) 2 m

Answer: a

10.

Two particles approach each other with a velocity of 0.9 c. What is their relative velocity as observed by A?
a) 0.9 c
b) 0
c) 0.99 c
d) 0.94 c

Answer: c

11. Which of the following is the momentum-energy relation?
a) $E^2 - p^2c^2 = m_0^2c^2$
b) $E^2 - p^2c^2 = m_0^2c^4$

c) $E^2 - p^2c^2 = m_0^2c^3$
d) $E^2 - p^2c^2 = m_0c^2$

Answer: b

12. 7. What will be the rest energy of an electron?
a) 0.41 MeV
b) 0.51 MeV
c) 0.61 MeV
d) 0.71 MeV

Answer: b

13. An object of rest mass 6 Kg is moving with a speed of 0.8c. Its effective mass is
_____
a) 6 Kg
b) 8 Kg
c) 10 Kg
d) 12 Kg

Answer: c

14. If an object reaches the speed of light, it's length changes to _____
a) Infinite
b) Double of the value
c) Half of the value
d) Zero

Answer: d

15. In Relativistic case, as the velocity of the particle approaches the speed of light, the Kinetic energy approaches _____
a) Zero
b) Kinetic Energy as in Non-Relativistic case
c) Rest Energy
d) Infinite

Answer: d