Physics Division

Military Institute of Science & Technology

B. Sc. in EWCE, L-1, T-II (Fall Semester-2023)

Class Test-01, Course Code: PHY-101, Course Title: Modern Physics

Full Marks: 20, Time: 30 minutes

Answer all the Questions

1. Why Lorentz transformation is used instead of Galilean transformation in special theory of relativity? 3

2. Derive the equation of Lorentz transformation in relativity with appropriate figure. 7

3. Explain length contraction with relevant expression. 6

4. The length of a spaceship is measured to be exactly $\frac{4}{5}$ th of its actual value. Calculate: 4
   (i) the speed of the spaceship and (ii) the time dilation corresponding to 2 sec on the spaceship.