**STUDENT’S ASSIGNMENT**

1. Does time dilation depend on whether a clock is moving across your vision or directly away from you?

**Ans**: No. A moving clock runs slow, no matter which way it is moving.

2. Two clocks at the ends of a train are synchronized with respect to the train. If the train moves past you, which clock shows the higher time?

**Ans**: The rear clock shows the higher time. It shows Lv/c2 more than the front clock, where L is the proper length of the train.

3. If observer Bill, who is on a train moving with speed 0.6*c*, waves to Julie at four second intervals as measured in Bill's frame, how long will Julie measure between waves?

**Ans**: Thus Julie measures 5/4×4 = 5 seconds between waves.

4. What must be the average speed of a muon, a certain type of elementary particle, in order for it to travel 20 meters before it decays? The average rest lifetime of a muon is 2.60×10-8seconds.

**Ans**: 1.72×104 m/s.

5. Differentiate proper time and improper time.

6. A muon forms at t=0 moving at a velocity v. After 2.2 microseconds, the muon decays. A stationary observer measured the lifetime to be 8.8 microseconds. What was the velocity of the muon?

Ans. V = 0.968c

7. At what speed does a clock move if it runs at a rate which is one-half the rate of a clock at rest?