ST. XAVIER'S SENIOR SECONDARY SCHOOL, DELHI – 110054

Class 11 Time : 1 hr.

25-7-2014 First Unit Test in PHYSICS M. Marks : 20

1. Name any two physical quantities which are dimensionless. (1)

2. Write the dimensional formula of linear momentum. Name another quantity that has the same dimensional formula as that of linear momentum. (1)

3. In a system of units, 10 meter, 1kg and 1minute are taken as fundamental units; the magnitude of force is 36 units. What is the value of this force in cgs system of units? (2)

4. Check the correctness of the following equation:

$$f = \frac{1}{2l}\sqrt{\frac{T}{m}}$$

Where f, l, T and m are frequency, length, tension, and mass per unit length respectively. (2)

5. Write the dimensional formula of 'a' and 'b' in the following formula

$P = \frac{a - t^2}{bx}$ Where P is pressure, x is distance and t is time. (2)

6. If the mass of the substance is given by M = (20±0.2) kg and volume of the substance is given by V= (10±0.1) m³. Calculate the percentage error in the determination of density of the substance. (2)

7. Two straight lines drawn on the same position-time graph make angle 30° and 60° with the time axis. Which line represents greater velocity. What is the ratio of velocity of A to the velocity of object B. (2)

8. The initial positions and the velocities of two bodies a and b are given by $X_a(0) = 15m$, $X_b(0) = -10m$, $v_a = -1m/s$, and $v_b = 2m/s$
When and where will these objects meet? Plot the position–time graph to show their meeting. (2)

9. The height 'h' to which the liquid rises in a capillary tube depends upon the surface tension(σ), density(ρ), acceleration due to gravity(g) and is inversely proportional to the radius(r) of the capillary tube. Drive the expression for 'h' using dimensional analysis. (3)

10. If $m_1 = (30.0 \pm 0.1)$ gm and $m_2 = (15.0 \pm 0.1)$ gm and v= (15.0±0.1)cm/s.
Calculate percentage of error in the determination E.

Where $E = \frac{(m_1 - m_2)v^2}{2}$ (3)

-x-x-x-x-x-