Sree Sainath Nagar,Tirupati – 517102

Holiday Package

Class: XI **Subject: Physics**

1. Scalar quantities are quantities with magnitudes only. Examples are distance, speed, mass and temperature.

2. Vector quantities are quantities with magnitude and direction both. Examples are displacement, velocity and acceleration. They obey special rules of vector algebra.

3. A vector A multiplied by a real number λ is also a vector, whose magnitude is λ times the magnitude of the vector A and whose direction is the same or opposite depending upon whether λ is positive or negative.

4. Two vectors A and B may be *added graphically* using *head-to-trail- method* or *parallelogram method*.

5. Vector addition is commutative :

   $$\mathbf{A + B = B + A}$$

   It also obeys the associative law:

   $$\mathbf{(A + B) + C = A + (B + C)}$$

6. A *null* or *zero vector* is a vector with zero magnitude. Since the magnitude is zero, we don’t have to specify its direction. It has the properties :

   $$\mathbf{A + O = A}$$
   $$\lambda\ \mathbf{O = O}$$
   $$\mathbf{O\ A = O}$$

7. The subtraction of vector B from A is define as the sum of A and – B:

   $$\mathbf{A - B = A + (-B)}$$

8. A vector A can be *resolved* into component along two given vectors a and b lying in the same plane:

   $$\mathrm{A} = \lambda \mathrm{a} + \mu \mathrm{b}$$

   where λ and μ are real numbers.

9. A *unit* vector associated with a vector A has magnitude one and is along the vector A:

   $$\hat{\mathrm{n}} = \frac{\mathrm{A}}{|\mathrm{A}|}$$

   The unit vectors $\hat{\mathrm{i}}, \hat{\mathrm{j}}, \hat{\mathrm{k}}$ are vectors of unit magnitude and point in the direction of the *x*-, *y*- and *z*-axis, respectively in a right-handed coordinate system.

10. A vector A can be expressed as

    $$\mathbf{A} = \mathbf{A}_x \hat{\mathrm{i}} + \mathbf{A}_y \hat{\mathrm{j}}$$

    where A_x, A_y are its components along with x-, and y –axis. If vector A makes an angle θ

    with the *x*-axis, then $A_x = A \csc\theta$, $A_y = A \sin\theta$ and $A = |\mathbf{A}| = \sqrt{A_x{}^2 + A_y{}^2}$, $\tan\theta = \frac{A_y}{A_x}$