



**UNIT TEST I**

**SESSION-2016-2017**

**SUBJECT- PHYSICS**

**CLASS -XI**

MAX MARKS: 25

TIME: 1 HOUR

NAME: \_\_\_\_\_

ROLL NO: \_\_\_\_\_

**General Instructions:**

1. All questions are compulsory.
  2. There are 10 questions in total. Questions 1 to 2 are 1 mark each, Question 3 to 5 are 2 marks each, Questions 6 to 9 are of 3 marks each and Question 10 is of 5 marks.
  3. There is overall no choice.  
However internal choice has been provided in one question of 2 marks.
  4. Use of calculator is not permitted.
  5. This paper consists of 2 printed sheets.
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- Q1. What are the dimensions of a and b in the relation  $F = a + bx$ , where F is the force and x is the distance? 1
- Q2. The displacement-time graph for the 2 particles A and B are straight lines inclined at angles of  $30^\circ$  and  $60^\circ$  with the time axis. What is the ratio of the velocities  $v_A : v_B$ ? 1
- Q3. What are the advantages of S.I over other systems of unit? 2
- Q4. Displacement of a particle is given by the expression  $x = 3t^2 + 7t - 9$ , where x is in meter and t is in seconds. What is acceleration? 2

OR

Determine the value of n, so that vectors  $\vec{A} = \hat{i} + 5\hat{j} + n\hat{k}$  and  $\vec{B} = 2\hat{i} - \hat{j} + \hat{k}$  are perpendicular.

- Q5. A physical quantity X is calculated from the relation  $X = \frac{a^2b}{\sqrt{c}}$ . If percentage error in a, b and c are 2%, 3% and 4% respectively, calculate the percentage error in 'X'? 2
- Q6. A body covers 4m in 3<sup>rd</sup> second and 12m in 5<sup>th</sup> second. If the motion is uniformly accelerated, how far will it travel in the next 3 seconds? 3

- Q7. (a) Define the term relative velocity. 3  
(b) Write the expression for relative velocity of one moving with respect to another body when objects are moving in same direction and are moving in opposite directions.  
(c) Two trains, each of length 100m, are running on parallel tracks. One overtakes the other in 20 second and one crosses the other in 10 second. Calculate the velocities of two trains.
- Q8. The terminal velocity depends upon weight ( $mg$ ) and radius  $r$  of a ball. It also depends upon the coefficient of viscosity  $\eta$ . By the method of dimensions, determine the relation expressing terminal velocity. 3
- Q9. (i) Draw the position time graph of an object moving with : 3  
(a) Uniform positive acceleration (b) zero acceleration  
(ii) Derive the equation  $v = u + at$  by calculus method.
- Q10. State parallelogram law of vector addition. Find analytically the magnitude and direction of resultant vector. 5  
What is the magnitude and direction of the resultant vector when:  
(i) two vectors are parallel to each other.  
(ii) two vectors are perpendicular to each other.

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