PHYSICS WORKSHEET

GRADE XI A

1. If $x = at + bt^2$, where x is in metres and t in hours (hr), what will be the units of 'a' and 'b'?
2. State the number of significant figures in the following:
   (i) 0.007 m^2 (ii) 2.64×10^{24} kg
   (iii) 0.2370 g cm^{-3} (iv) 6.320 J
   (v) 6.032 Nm^{-2} (vi) 0.0006032 m^2
3. A woman standing on the edge of a cliff throws a ball straight up with a speed of 8 kmh^{-1} and then throws another ball straight down with a speed of 8 kmh^{-1} from the same position. What is the ratio of the speeds with which the balls hit the ground?
4. The displacement-time graphs for the two particles A and B are straight lines inclined at angles of 30° and 45° with the time-axis. What is the ratio of the velocities?
5. The position coordinate of a moving particle is given by $x = 6 + 18t + 9t^2$ (x in metres and t in seconds). What is its velocity at t = 2 sec?
6. Draw the following graphs between distance and time of an object in case of
   (i) For a body at rest
   (ii) For a body moving with uniform velocity
   (iii) For a body moving with constant acceleration.
7. Mohan drive a car at a speed of 70 km/h along a straight road for 8.4 km. Then the car suddenly ran out of petrol. Mohan did not lose his cool. Instead he walked for 30 min to reach a petrol pump at a distance of 2 km.
   (a) What was the average speed from the beginning of his drive till he reached the petrol pump?
   (b) What was the average velocity from the beginning of his drive till he reached the petrol pump?
8. The magnitude of the resultant of two vectors of magnitudes 5 and 3 is 2. What is the angle between the two vectors ?
9. Velocity of a projectile is 10 ms-1. At what angle to the horizontal should it be projected so that it covers maximum horizontal distance ?
10. A projectile fired from the ground follows a parabolic path. The speed of the projectile is minimum at the top of its path. State whether this statement is true or false.

11. A ball is thrown at an angle of 45° to the horizontal with kinetic energy K What is the kinetic energy at the highest point of trajectory ?
12. What is the value of **A** × **A** ?
13. Find the scalar and vector product of two vectors, $\vec{a} = (3\hat{i} - 4\hat{j} + 5\hat{k})$ and $\vec{b} = (-2\hat{i} + \hat{j} + 3\hat{k})$
14. Find the angle of projection at which the horizontal range and maximum height of a projectile are equal.
15. A projectile is fired with a velocity 'u' making an angle θ with the horizontal. Show that its trajectory is a parabola.
16. Show that there are two angles of projection for which the horizontal range is same for a projectile.
17. The maximum range of projectile is $2/\sqrt{3}$ times actual range. What is the angle of projection for the actual range
18. Pick out only the vector quantities from the following : Temperature, pressure impulse, time, power, charge
19. For what angle of projection of a projectile, are the horizontal range and maximum height attained by the projectile equal ?
20. Define (i) unit vector (ii) null vector (iii) cross product of two vectors **A** and **B**.