DELHI PUBLIC SCHOOL, JAMMU

Session (2019-20)

ASSIGNMENT FOR HALFYEARLY EXAMINATION

CLASS: XI **SUBJECT: PHYSICS**

Q1.The time period (t) of oscillation of a small drop of liquid under surface tension, depends upon the density d, radius r and Surface tension S. Prove dimensionally that $t \alpha \sqrt{dr^3/S}$.

Q2. If force F, velocity v and time t are taken as fundamental quantities, what would be the dimensions of work (W) in terms of F, v and t?

Q3. A particle is projected vertically upwards from the ground at time t=0 and reaches a height h at t=T. Show that the greatest height of the particle is

$(gT^2+2h)^2/8gT^2$.

Q4. Determine the value of m so that $\vec{A} = 2i + mj + k$ and $\vec{B} = 4i - 2j - 2k$ are perpendicular.

Q5. Two forces acting on a particle in opposite directions have a resultant of 10 N. If they act at right angles to each other, the resultant is 50 N. Find the two forces.

Q6. A constant force acting on a body of mass 3 Kg changes its speed from 2 m/s to 3.5 m/s in 25 seconds. The direction of motion of the body remains unchanged. What is the magnitude and direction of the force?

Q7. A shell of mass 0.02 Kg is fired by a gun of mass 100 Kg. If the muzzle speed of the shell is 80 m/s, what is the recoil speed of the gun?

Q8. A train of 150 metric ton is drawn up a rough inclined plane of 1 m in 100 at the rate of 36 Km/h. If the friction is 12 newton per ton , calculate the power of the engine.

Q9. A bullet of mass 20 g moving with a velocity of 500 m/s strikes a tree and goes out from the other side with a velocity of 400 m/s. Calculate the work done in joule in passing through the tree.

Q10. Three identical spheres , each of radius R, are placed touching each other on a horizontal table. Where is the centre of mass of the system is located?