

KCP SIDDHARTHA ADARSH RESIDENTIAL PUBLIC SCHOOL

KANURU, VIJAYAWADA- 520 007.

UNIT TEST- II (PAPER PEN TEST) 2014 - 2015

Class : XI
Sub : Physics

Time : 90 Min.
Marks : 30

GENERAL INSTRUCTIONS:

- Answer all the questions.
 - Questions 1 to 5 are very short answer type carrying 1 mark each.
 - Questions 6 to 8 are short answer type carrying 2 marks each.
 - Questions 9 to 11 are short answer type carrying 3 marks each.
 - Questions 12 to 13 are long answer type carrying 5 marks each.
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- What is the magnitude of the resultant of two forces, one 6N due east and the other 8N due north?
- A bomb explodes in mid-air into two equal fragments. What will be the direction of motion of the two fragments?
- Are larger breaks on a bicycle wheel more effective than the smaller ones?
- What happens when a very light body in motion collides head-on with a heavy stationary body in an elastic collision?
- Can the centre of mass of a body lie where there is no mass?
- How will you distinguish between a hard boiled egg and a raw egg by spinning each on table top?
- How much work is required to accelerate a 1000 kg car from 20 m/s to 30 m/s?
- A stone thrown on a glass window pane smashes it to pieces but a bullet fired on it makes a clean hole in it. Why?
- Explain the solving problems in mechanics?
- What is energy? Write its units? State and prove work-energy theorem by a constant force.
- Derive the relation between angular momentum and torque of a particle?
- What do you mean by banking of a curved road? Determine the angle of banking so as to minimise the wear and tear of the tyres of a car negotiating a banked road?

(or)

Show that the elastic force of a spring is a conservative force. Hence write an expression for the potential energy of an elastic stretched spring.

- Prove that in an elastic one-dimensional collision between two bodies, the relative velocity of approach before collision is equal to the relative velocity of separation after the collision. Hence derive the expressions for the velocities of the two bodies in terms of their initial velocities before collision.

Discuss:

- When two bodies of equal masses collide
- When a body collides against a stationary body of equal mass

(or)

- Explain the motion of centre of mass of a system of particles
- Two particles of masses 100 gm and 300 gm at a given time have positions $(2\mathbf{i} + 5\mathbf{j} + 13\mathbf{k})$ and $(-6\mathbf{i} + n\mathbf{j} - 2\mathbf{k})$ respectively and velocities $(10\mathbf{i} - 7\mathbf{j} - 3\mathbf{k})$ and $(7\mathbf{i} - 9\mathbf{j} + 6\mathbf{k})$ m/s respectively. Determine the instantaneous position and velocity of CM.