J.E.E./A.I.P.M.T. Foundation - XI Physics Worksheet

Time: 30 min **Ch#7 : System of Particles and Rotational Motion-02** **Full Marks: 20**

Instructions:

1. All questions are compulsory.

2. Please give the explanation for the answer where applicable.

Q1 - Where is the centre of mass of a uniform cube located?

(1 Mark)

Q2 - A solid sphere and a hollow sphere having same density and radius are rolling down an inclined plane. Which one of them will reach first?

(1 Mark)

Q3 - Where is the centre of mass of a system of two particles is situated?

(1 Mark)

Q4 - In which situation, centre of mass has no acceleration?

(1 Mark)

Q5 - A solid cylinder of mass 20 kg rotates on its axis with angular speed 100 rad s-1.The radius of the cylinder is 0.25 m.What is the kinetic energy associated with the rotation of the cylinder? What is the magnitude of angular momentum of the cylinder about its axis?

(2 Marks)

Q6 - A rope of negligible mass is wound over a hollow cylinder of mass 4 kg and radius 27 cm.What is the angular acceleration of the cylinder if the rope is pulled with a force of 30N? What is the linear acceleration of the rope?

(2 Marks)

Q7 - What do you mean by conservation of linear momentum?

(2 Marks)

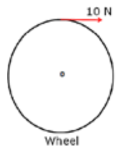
Q8 - A bullet of mass 50 g and speed 500 m/sec gets embedded exactly at the centre of the door. If the door is 1 m wide and weighs 12 kg, find the angular speed of the door just after the bullet embedded into it?

(2 Marks)

Q9 - A uniform chain of length 3 m is kept on a table such that a length of 40 cm hangs freely from the edge of the table. The total mass of the chain is 4 kg.What is the work done in pulling the entire chain on the table?

(3 Marks)

Q10 - A wheel is resting about its axis(fixed).A constant force of 10 N is applied tangentially to the wheel. Find the angular displacement made after one second. Also find angular speed after one revolution. Mass of the wheel is 10 kg and radius is 0.5 m.



(5 Marks)