XI Physics Worksheet

Time: 30 min **Ch#7 : System of Particles and Rotational Motion-01** **Full Marks: 20**

Instructions:

1. All questions are compulsory.

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

Q1 - Two masses m1 and m2 start moving towards each other due to their mutual force of attraction. What will be the change in their respective centre of mass position?

(1 Mark)

Q2 - What is the S.I. unit of angular momentum?

(1 Mark)

Q3 - Is radius of gyration of a body a constant quantity?

(1 Mark)

Q4 - A child starts running from one end to another end of a trolley which is moving with uniform speed V on a smooth horizontal floor. What is the speed of the C.M. of the (trolley+ child) system?

(2 Marks)

Q5 - Find the moment of inertia of a solid sphere about a tangent to the sphere.

(2 Marks)

Q6 - Prove that the torque experienced by a particle is equal to the product of its moment of inertia and angular acceleration.

(2 Marks)

Q7 - Find the moment of inertia of a rod of length l about an axis passing through its mid point and perpendicular to it?

(3 Marks)

Q8 - A man of mass m_1 is standing on a platform of mass m_2 kept on a smooth horizontal surface. The man starts moving on the platform with a velocity V_r relative to the platform. Find the recoil velocity of the platform.

(3 Marks)

Q9 - A particle traverses its circular path as

$\theta = 2t^2 + t$ where,

θ is the angle made at the centre in radian and t is time in seconds. Find

(a) angular displacement at t = 2 s

(b) angular velocity at t = 2 s

(c) angular acceleration

(d) tangential acceleration at t = 1s if radius of circle is 5 m.

(5 Marks)