

Sharjah Indian School Sharjah- Boys Wing

Reinforcement sheet in Physics (Rotational Motion) – Class XI

I. Choose the correct alternative from the following:

- a. Torque is the rotational analogue of:  
i. Force ii. Momentum iii. Velocity iv. Work
- b. The unit of Moment of Inertia is:  
i.  $\text{kg}\cdot\text{m}$  ii.  $\text{kg}/\text{m}$  iii.  $\text{kg}/\text{m}^2$  iv.  $\text{kg}\cdot\text{m}^2$
- c. The rotational kinetic energy of a body is given by:  
i.  $\frac{1}{2} I \omega^2$  ii.  $I \omega$  iii.  $\frac{1}{2} I \omega$  iv.  $2 I \omega$

II. State whether write or wrong. If wrong, correct the statement:

- a. Moment of Inertia of a body does not depend on the axis of rotation of the body.  
b. The centre of mass of the Earth-Moon system follows the orbit around the Sun.  
c. The melting of ice at the polar caps of the Earth decreases the duration of day.

III. Answer the following:

- a. If the earth suddenly shrinks to half of its present radius without changing its mass, what will be the percentage change in the Period of revolution of the Earth?
- b. The energy possessed by a compressed spring of spring constant  $1500 \text{ N/m}$  is used to rotate a rigid body about an axis without providing translational motion to the body. If the compression of the spring is  $10\text{mm}$  and the moment of inertia of the rigid body is  $20 \text{ S.I units}$ , determine the angular velocity of the body.
- c. Three identical spheres, each of radius  $R$  are kept as shown. Locate the centre of mass of the system.

