EXPERIMENT NO.05

MOMENT OF INERTIA OF FLYWHEEL

Aim: To find moment of inertia of flywheel

Apparatus: Flywheel mounted on axle and supported by bearing, pan, weights, and stopwatch.

Theory:

Moment of Inertia is the property of the body by virtue of which it resists the change in the state of its angular motion about any axis. It depends upon the mass of the body and the distance with respect to axis of rotation.

For falling mass,

Initial velocity = v = 0

Height of fall = h

a= 2h/t^2

Resultant force = T-mg

-F = T-mg

-ma = T-mg

T = m(g-a)

Moment 'M' = Iα

T*r = I *a/r (since a= rα)

I = Tr^2/a

I = m (g – a) r^2/ a

Procedure:

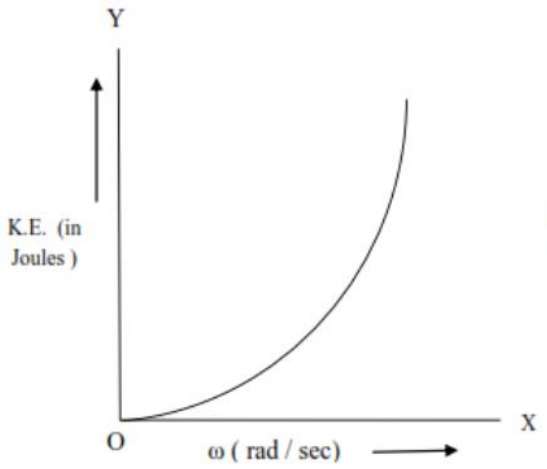
Attach a long thread about 1.8 m length to the axle of flywheel and end of thread is attached to the axle while the pan is attached to the outer end of the thread. Weight should be added so that pan must be in suitable line on the wheel by which we can calculate no. of revolutions of the wheel. Wrap the thread on the axle and measure the height of the pan from the ground level, and then add the weights in the pan and take readings of time required for pan to touch the ground. This time is calculated by using the stopwatch as soon as weight starts moving down.

Take different weights and corresponding time and complete the observation table.

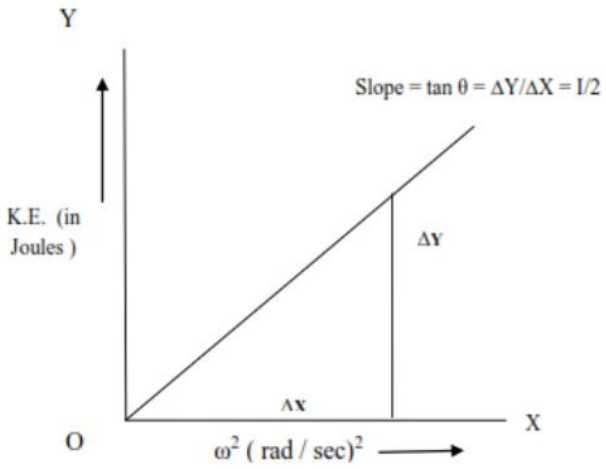
Sr.No	Mass(kg)	Time (sec)	Acceleration(a)	Tension T	M.I=T.a^2/a
1.					
2					
3					
4					

Result: Moment of Inertia of fly wheel is ---------- Kg m^2.

Flywheel Apparatus



GRAPH FOR K.E. Vs. ω



GRAPH FOR K.E.Vs. ω^2