Practical Examination 2021
Semester I

Paper GE-1

Mechanics

Full marks 20

Time 45 minutes

Answer all Questions

1. (a) Derive the expression of time period of oscillation (T) of bar pendulum as a function of distance of the point of oscillation from center of gravity (r) and radius of gyration (K). 5

(b) A typical observation is mentioned here.

$r^2\,(m^2)$	$T^2 r\ (\sec^2 m)$
0.088	0.682
0.124	0.845
0.161	0.983
0.204	1.171

With a linear fit to the data it is found that the slope of the linear plot is 4.170 and the intercept is 0.3188. Calculate the values of g and K from it. 2+2

2. (a) Derive the formula for moment of inertia of Flywheel. 6

(b) Experimental data for an experiment are given below.

m Kg	n_1	n_2	$\bar{t}^2_{stop}$ sec^2	r meter	mr $Kg-meter$	$\frac{n_2}{n_1+n_2}$	$\frac{n_1}{n_2^2}$
0.2254	15	120.916	10416.24	1.095×10^{-2}	2.251×10^{-3}	0.8896	1.025×10^{-3}
0.3054	15	170.95	14294.59	1.095×10^{-2}	3.841×10^{-3}	0.9193	5.132×10^{-3}

Calculate moment of inertial of the Flywheel for these two data and find the mean value. 5