ME 352A

LAB MANUAL-3

EPICYCLIC GEAR TRAIN EXPERIMENT

INTRODUCTION:

Any combination of gear wheels by means of which motion is transmitted from one shaft to another shaft is called a gear train. In case of epicyclic gear trains, the axes of the shafts on which the gears are mounted may move relative to a fixed axis.

STEPS:

1. Tighten the bolt to adjust the loads to zero mark.
2. Switch on the apparatus.
3. Note various reading by setting initial speed (200)by turning the knob.
4. Tighten further the load to decrease gearbox speed to 180 and note all reading.
5. Produce table and plot various reading (ammeter, voltmeter, various torques) with gearbox speed.
6. Repeat process for subsequent lower speed.

Observation table

S. No	RPM N_0	RPM N_M	Ammeter (A)	Voltmeter (V)	Load S_1(N)	Holding Torque T_h	Load S_2(N)	Load S_3(N)	Input Torque T_i	Output Torque T_o	Verification
	200										
	180										
	160										
	140										
	120										
	100										

1. Verify the torque relationship as $T_i + T_0 + T_h = 0$.
2. Develop correlation between speed and torque.

Formulae:

$$T_i = T_0 \times \frac{N_0}{N_M}$$

$$T_0 = (S_2 - S_3) \times R_P$$

$$T_h = S_1 \times R_{HD}$$

R_p = Effective radius of pulley (0.125 m)

R_{HD} =Effective radius of holding drum (0.185 m)

Note: In case of fluctuation in reading, take the average value.