



This exam measures the following ILOs($a_4, a_{13}, a_{19}, b_2, b_{17}, c_7$)

ANSWER THE FOLLOWING QUESTIONS :- (85 MARKS)

(MARKS)

Question No. 1 :-

(25)

A – In the mechanism shown in Fig.1, the crank O_2A rotates with uniform angular velocity of 20 rad/s in clockwise direction. Determine for the given position the angular velocity and angular acceleration of the link O_6C . Given :- $O_2A = 4$ cm, $AB = 20$ cm, $O_2O_4 = 19$ cm, $O_4B = 8$ cm, $O_4O_6 = 4$ cm and $O_6C = 8$ cm

(15)

B- If the driving torque that acting on the crank O_2A is 40 N.m, find the resisting torque at link O_6C to maintain the mechanism in static equilibrium.

(10)

Question No. 2 :-

(20)

The variation of crank shaft torque of 4-cylinder petrol engine may be approximately represented by taking increase uniformly from zero to 280 N.m during the half revolution, then decrease uniformly to 140 N.m during the next half revolution. It then remain constant for the following one revolution. This cycle being repeated in every two revolutions. The average speed is 800 rpm. Supposing that the engine drives a machine requiring a constant torque, determine:-

A – The mass of the flywheel, of radius of gyration 0.4 m to limit the total speed variation to 4 revolutions, and

B - The horse power necessary to drive the machine.

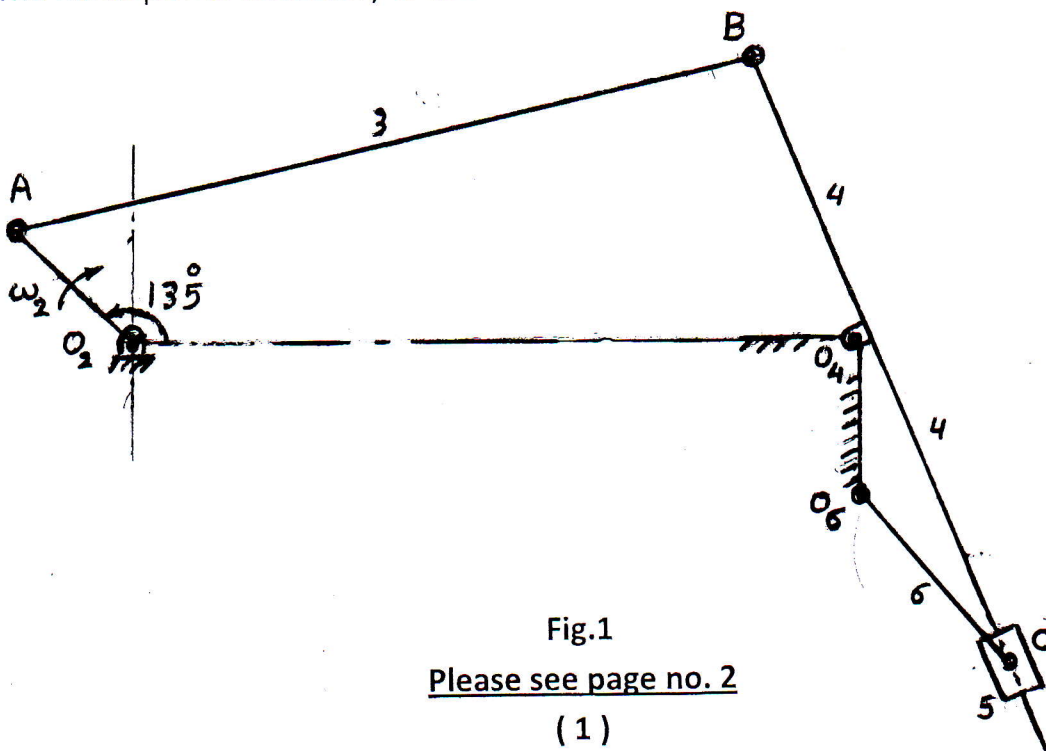


Fig.1

Please see page no. 2

