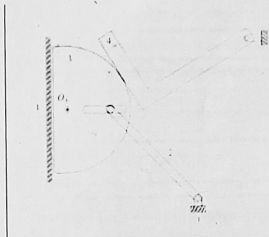
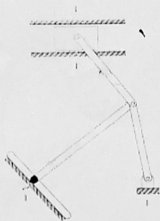


Answer all the following questions.

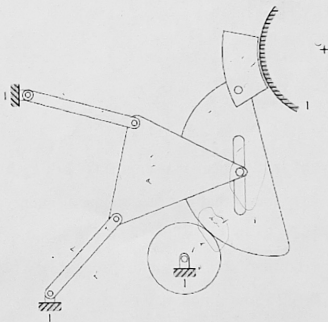
1. Use the Kutzbach criterion to determine the mobility of the mechanism ?

[3 marks]

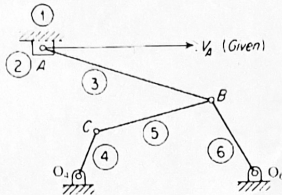


2. Determine the number of links, the number of lower pairs, and the number of higher pairs. Treat rolling contact to mean rolling with no slipping.

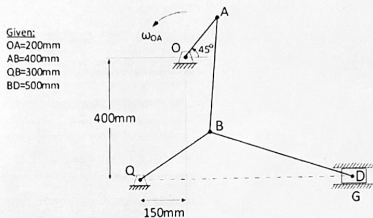
[3 marks]



3. In Figure the velocity of point A is given (20 m/s) and the velocities of points B and C are required. [4 marks]



4. For the mechanism shown in Figure (13), the crank OA rotates at 210rpm counter-clockwise increasing at the rate of 60 rad/sec^2 . For the given configuration, find the Acceleration of slider D and the angular acceleration of link BD. [6 marks]



5. The mass of the flywheel of an engine is 6500 kg and the radius of gyration is 1.8 m . It is found that the fluctuation of energy in the turning moment diagram is 56 kNm . (1) When the mean speed of the engine is 120 rpm , find the maximum and minimum speeds. (2) When the starting torque of the engine is 2500 Nm and may be assumed constant. Find (a) the angular acceleration of the flywheel, and (b) the maximum kinetic energy of the flywheel. [4 marks]