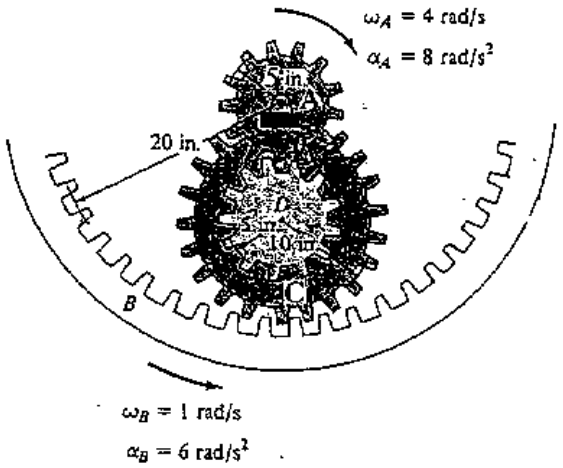
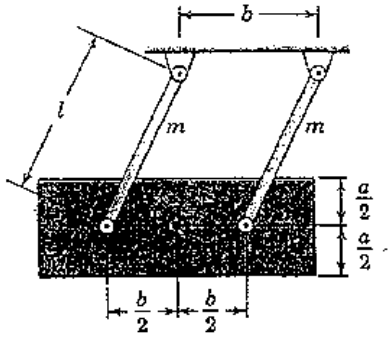
國立中央大學九十學年度碩士班研究生入學試題卷

所別：機械工程學系　丁組　科目：丁動力學　共 2 頁 第 1 頁

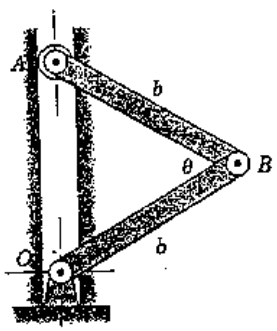
1. At a given instant gears **A** and **B** have the angular motions shown. Determine the angular acceleration of gear **C** and the acceleration of its center point **D** at this instant. Note that the inner hub of gear **C** is in mesh with gear **A** and its outer rim is in mesh with gear B. (25 %)



2. The mass M is suspended by two rods each of mass m. Find the **nonlinear** equation of motion of the system. Determine the natural frequency of small oscillation. (25 %)

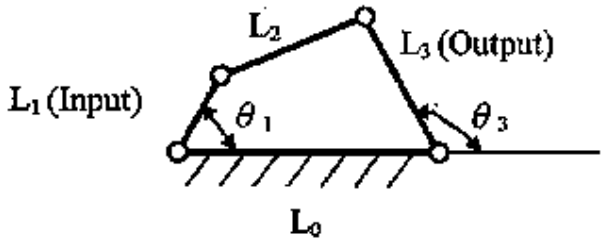


3. The two identical links, each of length b and mass m, may be treated as uniform slender bars. If they are released from rest in the position shown with end A constrained by the smooth vertical guide, determine the velocity v with which A reaches O with θ essentially zero. (25 %)



注意：背面有試題

4. For the four-bar linkage shown below, L_0=380, L_1= 120, L_2 =250, L_3=320.



(a) Find the maximum and minimum transmission angle (μ_{max}, μ_{min}) of the linkage. 6%

(b) Find the input link angles (θ_1), when the linkage is in toggle positions. 6%

(c) Find the output link oscillating angle ($\Delta\ \theta_3$), if the input link rotates continuously. 4%

(d) Find the output link angle θ_3, while the input link angle θ_1 is 60°. 5%

(e) Find the ranges of value for the L_0 if the linkage can always be operated as double-rocker mechanism. 4%