*可使用計算機

1.　Please explain the following terms: (25%)

    (a) cognate

    (b) kinematic inversion

    (c) structural error

    (d) circle-point curve

    (e) inflection circle

2. Find all possible non-isomorphic 6-bar planar kinematic chains with one degree of freedom and simple turning pairs only. (25%)

3.(a) Find the three-precision-point Chebyshev spacing for the function $y = \sin x$, $0^{°} \leqq x \leqq 90^{°}$, where $\Delta \varphi = 60^{°}$ and $\Delta \phi = 90^{°}$.

  (b) Find φ_j, ψ_j (j=2, 3).

  (c) Find an acceptable four-bar function generator by the graphical method, with $\psi_0 = 60^{°}$, $A_0 B_0 = 1$ (the ground link), $B_0 B = 0.75$ (the output link).

  (25%)

4. As part of an automation process, a four-bar linkage must be designed to remove boxes from one conveyor belt and deposit them on an upper conveyor belt as shown in Fig.4 (three prescribed positions). Both fixed and moving pivots must be located between the upper and lower conveyor belts. Design an acceptable four-bar by the graphical method. (25%).
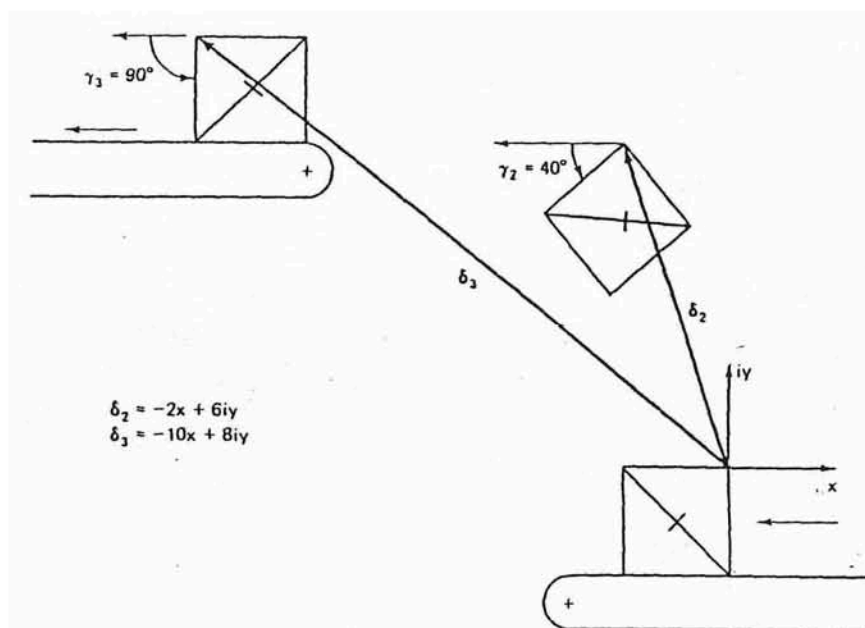

Fig. 4