

系所組別： 工業設計學系丙組

考試科目： 電腦輔助設計概論

考試日期： 0219，節次： 3

※ 考生請注意：本試題 可 不可 使用計算機

1. Please describe how to represent 3-dimensional objects in the computers for a CAD system. (10%)
2. Please derive a transformation matrix for rotating an angle θ with respect to the origin. (20%)
3. How to set the control points for two cubic B'ezier curves such that they have C^1 continuity at the connecting joint? (10%)
4. What is the NURBS in computer graphics and how to construct it? (10%)
5. Please create the open knot vector for constructing a third-order ($k=3$) B-spline with 4 control points. (20%)
6. Please find the final position vectors of the triangle ABC after rotating an angle 45° with respect to the origin. Assume the original vertexes of the triangle are located on (4, 2), (4, 4), (2, 4), respectively. (20%)
7. Why the homogeneous coordinate system is usually used in configuration transformation? (10%)