

考試科目 Course	組合學	開課系級 Dept. & Class	研究所	日期 Date, Period	104 年 3 月 9 日 上午 9:00~12:00	試題編號 Course No.
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本試卷共有 6 個題目，

碩士班：請選 5 題作答，每題 20 分，請在答案卷最前面註明所選的 5 題，否則依學生作答之前 5 題計分。

博士班：6 題全作答，每題 17 分，超過 100 分則以 100 分計。

1. A line graph $L(G)$ of a graph G has a vertex of $L(G)$ for each edge in G and an edge between 2 vertices in $L(G)$ corresponding to 2 edges of G with a common end vertex. (a) Show that each vertex in $L(K_n)$ has degree $2(n-2)$. (b) Find all graphs that are isomorphic to their own line graph.
2. Show that if every region in a planar graph has an even number of bounding edges, then the vertices can be 2-colored.
3. How many r -digit quaternary sequences are there in which the total number of 0s and 1s is even?
4. (a) Find and solve a recurrence relation for the number of different square subboards of any size that can be drawn on an $n \times n$ chessboard. (b) Repeat part (a) for rectangular subboards of any size.
5. How many ways are there to arrange the letters in INTELLIGENT with at least two consecutive pairs of identical letters?
6. How many four-bead necklaces are there in which each bead is one of the colors black, white or red, and there is at least one red?

本考試： 不需使用簡易計算機， 使用簡易計算機

←請出題老師勾選，謝謝！

命題老師：
(Teacher)

(簽章) 104 年 3 月 1 日
(Signature & date)

試題隨卷繳交

命題紙使用說明：試題將用原件印製，敬請使用黑色墨水正楷書寫或打字（紅色不能製版請勿使用）。

Remarks : For the convenience of reprinting please Write questions in black or blue-black (but no red) ink.