

國立聯合大學 101 學年度碩士班考試招生

土木與防災工程學系碩士班 入學考試試題

科目： 工程數學 第 1 頁共 1 頁

每題20分

1. (a) What are P.D.E. (Partial differential equation) and O.D.E. (Ordinary differential equation)?  
(b) Use governing equations of beam and plate to explain the different of those.

2. Solve the differential equation  $y'' - 4y' + 4y = e^{2x} / x$ .

3.  $A = \begin{bmatrix} 2 & 1 \\ 2 & 1 \end{bmatrix}$  Find the orthogonal similar transform matrix to make A an diagonal matrix.

4.  $\vec{F} = 3xy^2\vec{i} + (yx - y^3)\vec{j} + (z^3 - x^3)\vec{k}$  Find  $\iint_S \vec{F} \cdot \vec{n} dA = ?$

S is the surface of  $x^2 + y^2 \leq 25, 0 \leq z \leq 2$ .

5. Evaluate the following integral counterclockwise around and simple closed path such that (a) 0

and 1 are inside C (b) 0 is inside, 1 outside (c) 0 and 1 are outside.  $\oint_C \frac{4 - 3z}{z^2 - z} dz$