淡江大學九十三學年度轉學生招生考試試題

系別：工組三年級　　　　　科目：工 程 數 學

| 准帶項目請打「○」否則打「×」 | |
|---|---|
| × | 簡單型計算機 |

節次：7 月 14 日第 四 節

本試題共 壹 頁

1. Solve $y^2 - 6xy + (3xy - 6x^2)y' = 0$. (15%)

2. Solve $y'' - 8y' + 16y = 5e^{4x}$. (15%)

3. Use the Laplace transform to solve the system

    $x' - 2y' = 1$, $x' + y - x = 0$; $x(0) = y(0) = 0$. (20%)

4. Find the eigenvalues and orthonormal eigenvectors corresponding to each eigenvalue of matrix A. (Hint: The orthonormal eigenvector has norm 1.)

$$[A] = \begin{bmatrix} 1 & 0 & \sqrt{2} \\ 0 & 2 & 0 \\ \sqrt{2} & 0 & 0 \end{bmatrix}.$$ (20%)

5. Evaluate $\int_C xz\,dy$ with C the line segment from (0,0,0) to (1,3,2).

    (15%)

6. Evaluate $\oint 2y\,dx - x\,dy$, C the circle of radius 4 about (1,3).

    (15%)