

淡江大學 100 學年度碩士班招生考試試題

54

系別：電機工程學系

科目：數學

積體電路與計算機系統組

(含線性代數、機率學、常微分方程、複變函數)

考試日期：2 月 28 日(星期一) 第 2 節

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1. (25%) Find an orthogonal matrix P that orthogonally diagonalizes the matrix

$$A = \begin{bmatrix} 1 & -2 & 0 \\ 0 & 0 & 0 \\ -5 & 0 & 7 \end{bmatrix}$$

2. (25%) Find the inverse Laplace transform of

$$F(s) = \frac{2s+3}{s^2+4s-6}$$

3. (25%) Solve the following differential equation

$$y''(x) + 3y'(x) + 2y(x) = 2\cos(x)$$

4. Consider the following random process

$$X(t) = A \cos(w_0 t + \Theta)$$

- (a) (10%) Find the expectation $E(X(t))$

- (b) (15%) Find autocorrelation function