

國立彰化師範大學 97 學年度碩士班招生考試試題

系所：電子工程學系碩士班

組別：甲/乙組

科目：工程數學

☆☆請在答案紙上作答☆☆

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1. Solve the following initial value problem. (20%)

$$y'' + 7y' + 10y = 5e^{-t}u(t-2), \quad y(0) = 0, \quad y'(0) = 1$$

2. Solve the following integral, (20%)

$$\int_0^{\infty} te^{-3t} \cos(at) dt$$

3. Find the inverse of the following matrix. (20%)

$$A = \begin{bmatrix} -2 & 1 & 2 \\ 3 & 1 & -2 \\ 2 & 4 & 4 \end{bmatrix}$$

4. Find the Fourier cosine series of the following function, (20%)

$$f(x) = x \quad (0 < x < 2)$$

5. Evaluate the integral, (20%)

$$\int_{-\infty}^{\infty} \frac{\cos(x/4)}{x^2 + \pi^2} dx$$