

國立彰化師範大學九十六學年度碩士班招生考試試題

系所：電子工程學系

科目：工程數學

請在答案紙上作答

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1. Solve the following differential equations.

a. $y''+2y'-3y=2e^x$. (10%)

b. $y'=2\frac{y\ln y}{x}$. (10%)

2. Find the Laplace transform of the following function.

a. $t\sin(t+a)$. (10%)

b. $t^3\sinh 2t$. (10%)

3. Solve the following equation.

$$y(t) - \int_0^t y(\tau)\sin(t-\tau)d\tau = 1. \quad (20\%)$$

4. Evaluate the surface integration $\iint_S \mathbf{F} \cdot \mathbf{n} dA$ with $\mathbf{F}=[2x, z, 3y]$, $S: x+y+z=2$, $x \geq 0$, $y \geq 0$, $z \geq 0$. (20%)

5. Find the Fourier series of the periodic function $f(x)$, of period of $P=2\pi$

$$f(x)=x+\pi/2, \quad -\pi < x < \pi. \quad (20\%)$$