淡江大學 95 學年度碩士班招生考試試題

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系別：水資源及環境工程學系　　科目：工 程 數 學

准帶項目請打「V」	
√	簡單型計算機

本試題共 1 頁

1. Solving $2(e^x \cos y + 1)y' - 4x + 2e^x \sin y = 0$ (20%)

2. Determing $\mathcal{L}[f]$ if $f(t) = 0$ for $0 \le t < 2$ and $f(t) = 1 + t^2$ for $t \ge 2$ (20%)

3. Finding the function $y(x)$ that passes through the points $(0, 0)$ and $(1, 1)$ and minimizes $J[y] = \int_0^1 [y^2 + y'^2]\, dx$ (20%)

4. Solving Partial Differential Eqn

$$u_t = a^2 u_{xx}$$

$$\text{B.C}_s \begin{cases} u_x(0, t) = 0 \\ u_x(L, t) = 0 \end{cases} \quad 0 \le x \le L$$

$$\text{I.C.} \quad u(x, 0) = f(x)$$

(20%)

5. Evaluating the line integral of $\vec{F}(x, y, z) = -x\vec{i} + y\vec{j} - z\vec{k}$ over the straight line segment from $(1, 1, 1)$ to $(-2, 1, 3)$ (20%)