

淡江大學 96 學年度碩士班招生考試試題

系別：土木工程學系

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. Solve the following Differential Equation? (20%)

a) $1 + (3x - e^{-2y}) y' = 0$

b) $x^2 y'' - 5xy' + 10y = 0 ; y(1) = 4, y'(1) = 6$

c) $y'' - 4y' + 4y = e^{3x} - 1$

2. Find the first five nonzero terms of Power Series Solution of the initial value problem, about the point where the initial condition is given. (20%)

$y'' + 2xy' + (x-1)y = 0 ; y(0) = 1, y'(0) = 2$

3. Use the Laplace transform to solve the following I.V.P. (20%)

a) $y'' + 4y = f(t) ; y(0) = y'(0) = 0, f(t) = \begin{cases} 0, & t < 3 \\ t, & t \geq 3 \end{cases}$

b) $y' + 2y = e^{-t} ; y(0) = 1$

4. Find the general Solution of the system. (20%)

$$\begin{aligned} 4x_1 - 2x_2 + 3x_3 + 10x_4 &= 1 \\ x_1 - 3x_4 &= 8 \\ 2x_1 - 3x_2 + x_4 &= 16 \end{aligned}$$