

淡江大學 95 學年 1 月 進修學士班轉學生招生考試試題

14

系別：電機工程學系三年級

科目：工 程 數 學

14-1

准帶項目請打「V」	
X	簡單型計算機

本試題共 1 頁

一. Find the general solution for the following problem.

$$y' + \frac{1}{x}y = 3e^{-x^2} \quad (20\%)$$

二. Solve the initial value problem.

$$y'' + 6y' + 9y = 1; \quad y(0) = \frac{10}{7}, \quad y'(0) = 0 \quad (20\%)$$

三. Find the inverse Laplace transform of the following

function: $\frac{1}{s(s^2 + 1)}$. (20%)

四. Find the Fourier transform of the function

$$f(t) = H(t)e^{-t}, \quad \text{where } H(t) = \begin{cases} 0 & \text{if } t < 0 \\ 1 & \text{if } t \geq 0 \end{cases} \text{ denotes the Heaviside function.} \quad (20\%)$$

五. Consider a surface described by $x^2 + y^2 + z^2 = 4$.

Find the equation of the tangent plane to the surface at the point $(1, 1, \sqrt{2})$. (20%)