

中國文化大學 99 學年度轉學招生考試

系組：化學工程與材料工程學系三年級

日期節次：7 月 28 日第 3 節 13:30-14:50

科目：工程數學 (87-127)

Solve the following equations:

1. $\frac{d^2y}{dx^2} - \frac{dy}{dx} - 6y = 0$ (20%)

2. $x^2 \frac{d^2y}{dx^2} - 2y = 0$ (20%)

3. $(1+x)dy - ydx = 0$ (20%)

4. $\frac{d^2y}{dx^2} - 10\frac{dy}{dx} + 25y = 30x + 3$ (20%)

5. $\frac{\partial u}{\partial t} = c^2 \frac{\partial^2 u}{\partial x^2}$ (20%)

$$\begin{cases} \text{I.C.} & t = 0, & u = f(x), & 0 \leq x \leq L \\ \text{B.C.1} & x = 0, & u = 0, & t \geq 0 \\ \text{B.C.2} & x = L, & u = 0, & t \geq 0 \end{cases}$$

$$\text{where } f(x) = \begin{cases} 1, & 0 < x < L/2 \\ 0, & L/2 < x < L \end{cases}$$