

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%)

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

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