

中國文化大學 104 學年度日間學士班暑假轉學招生考試試題

系組：化學工程與材料工程學系三年級

日期節次：104 年 7 月 11 日第 1 節

科目：工程數學

Solve the following equations:

$$1. \frac{dy}{dx} - 5y = 0 \quad (20\%)$$

$$2. x^2 \frac{d^2 y}{dx^2} + 4x \frac{dy}{dx} + 2y = 0 \quad (20\%)$$

$$3. \frac{d^2 y}{dx^2} - 4 \frac{dy}{dx} + 13y = 0 \quad (20\%)$$

$$4. \frac{d^2 y}{dx^2} + 4y = e^{2x} \quad (20\%)$$

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

$$\begin{cases} I.C.1 & t = 0, & u = H, & 0 \leq x \leq L \\ I.C.2 & t = 0, & \frac{\partial u}{\partial t} = Q, & 0 \leq x \leq L \\ B.C.1 & x = 0, & u = 0, & t \geq 0 \\ B.C.2 & x = L, & u = 0, & t \geq 0 \end{cases},$$

where c, L, H, Q are constants.