

# 義守大學 101 學年度碩士班入學招生考試試題

系所別	電機工程學系、電子工程學系、 機械與自動化工程學系	考試日期	101/3/18
考試科目	工程數學(常微分方程)	頁碼/總頁數	1/1

※此為試題卷，請將答案填寫在答案卷內，未寫於答案卷內者，不予計分。

※本科目不可使用計算機。

(1) Solve the differential equation:  $\frac{dy}{dx} = y^2 - 9$ . (10 分)

(2) Solve the differential equation:

$$(e^{2y} - y \cos xy)dx + (2xe^{2y} - x \cos xy + 2y)dy = 0. \quad (15 \text{ 分})$$

(3) Solve the differential equation:  $x \frac{dy}{dx} + (3x+1)y = e^{-3x}$ . (10 分)

(4) Solve the differential equation:  $y'' - y = \cos^2 x$ . (15 分)

(5) Solve the differential equation:  $y'' + 3y = -48x^2$ . (15 分)

(6) Solve the following equation:  $y'(t) = 1 - \int_0^t y(\tau) d\tau$ ,  $y(0) = 0$ . (15 分)

(7) Solve the following equations:

$$\begin{cases} 2 \frac{dx}{dt} + \frac{dy}{dt} - 2x = 1 \\ \frac{dx}{dt} + \frac{dy}{dt} - 3x - 3y = 0 \end{cases}, \quad x(0) = 0, y(0) = 0. \quad (20 \text{ 分})$$