國立臺南大學 106 學年度 **綠色能源科技學系碩士班** 招生考試 工程數學 試題卷

Solve the following differential equations(共 9 題，100 分)

1. $(2\cosh y + 3x)dx + (x\sinh y)dy = 0$ (10%)

2. $y' + 6xy = 0, y(0) = 15$ (10%)

3. $y'' - 2B^2y' + B^4y = 0$, where B is an arbitrary constant (10%)

4. $y' = 1/(6e^y - 2x)$ (10%)

5. Find a homogeneous Cauchy-Euler differential equation whose general solution is given as:
$y = C_1x^4 + C_2x^{-2}$ (10%)

6. 試求 $\frac{dy}{dx} + \frac{2}{x}y + x^4y^3 = 0$ 的通解 。(10%)

7. 試求 $y'' + 3y' + 3 = 3e^{-3x}$ 的通解 。(10%)

8. 試求 $x^2y'' - 3xy' + 4y = x^2$ 的通解 。(20%)

9. 設 $f(t)$ 的 Laplace 轉換為

$$\frac{s^3 + s^2 + 1}{s^2(s^2 + 4)}$$

求 $f(t)$ 。(10%)