國立彰化師範大學 99 學年度碩士班招生考試試題

系所：車輛科技研究所　　科目：工程數學

☆☆請在答案紙上作答☆☆　　共 1 頁，第 1 頁

* 共五題、請依序作答、每題 20 分。

1. Please find the general solution of $y'' + 4y = x + 2e^{-2x}$.

2. Please solve the equation using Laplace transform.

$ty'' + (4t - 2)y' - 4y = 0; \quad y(0) = 1$.

3. A parallelogram has two incident sides extending from (0, 1, −2) to (1, 2, 2) and from (0, 1, −2) to (1, 4, 1). Please find the area of this parallelogram.

4. Solve the system as the following

$$\begin{aligned} -x_2 + 2x_3 + 4x_4 &= 0 \\ -x_3 + 3x_4 &= 0 \\ 2x_1 + x_2 + 3x_3 + 7x_4 &= 0 \\ 6x_1 + 2x_2 + 10x_3 + 28x_4 &= 0 \end{aligned}$$

5. Let *a* and *k* be positive numbers, and $f(t) = \begin{cases} k, & -a \le t < a, \\ 0, & \begin{cases} t \ge a, \\ t < -a \end{cases} \end{cases}$

please find the amplitude spectrum of $f(t)$.