

國立臺北科技大學九十九學年度碩士班招生考試

系所組別：1410、1420、1431、1432

能源與冷凍空調工程系碩士班甲、乙、丙組

第一節 工程數學 試題

第一頁 共一頁

注意事項：

1. 本試題共五題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

五、 please use Laplace Transform to find the solution of the following equation (20%)

$$\frac{\partial w}{\partial x} + x \frac{\partial w}{\partial t} = 0, \quad w(x,0) = 0, \quad w(0,t) = t \quad (t \geq 0)$$

一、 please find the solutions of the following equations

1. $2xyy' - y^2 + x^2 = 0$ (10%)

2. $y' - y = e^{2x}$ (10%)

二、 please find the solution of the following equation (20%)

$$y'' - 4y' + 3y = 10e^{-2x}, \quad y(0) = 1, \quad y'(0) = -3$$

三、 please use Power Series method to find the solution of the following equation (20%)

$$y' = y + x^2, \quad y(0) = 1$$

四、 please find the solutions of the following equations (20%)

$$x' = \frac{3}{t}x + \frac{1}{t}y, \quad t > 0$$

$$y' = -\frac{4}{t}x - \frac{1}{t}y, \quad t > 0$$