

國立臺北科技大學九十六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。

一、please find the solutions of the following equations

1. $\sin y \, dx + \cos y \, dy = 0$ (10%)
2. $x^2 y'' - 2.5xy' - 2y = 0$ (10%)

二、please find the solutions of the following equations by the Power Series method

1. $y' = 2xy$ (10%)
2. $y'' + y = 0$ (10%)

三、please find the solutions of the following equations

1. $y' + y \tan x = \sin 2x$ $y(0) = 1$ (10%)
2. $y'' + y' - 2y = 0$ $y(0) = 4, \quad y'(0) = -5$ (10%)

四、Solve the initial value problem by Laplace Transforms method (20%)

$$y'' + 2y' + y = e^{-t} \quad y(0) = -1 \quad y'(0) = 1$$

五、please find the solution of the following equations (20%)

$$u_t = 9u_{xx}, \quad 0 < x < 2, \quad t > 0$$

Boundary conditions $u(0, t) = 0, \quad u(2, t) = 0 \quad t > 0$

Initial condition $u(x, 0) = x, \quad 0 \leq x \leq 1$

$$u(x, 0) = 2 - x, \quad 1 < x \leq 2$$