

大同大學103學年度(寒)轉學入學考試試題

考試科目:工程數學

所別:化學工程學系

第一頁

註:本次考試 不可以參考自己的書籍及筆記; 不可以使用字典; 不可以使用計算機

1. (20%) Solve $y'' - 3y' - 4y = 6e^{4x}$

2. (20%) Solve $x^2y'' + xy' + y = 0$

3. (20%) Solve $y' + 5y/x = x^3 + 2$; $y(1) = 10$

4. (20%) Solve the boundary value problem, k is a constant

$$\frac{\partial u}{\partial t} = k \frac{\partial^2 u}{\partial x^2}, \quad 0 < x < 1, \quad t > 0,$$

$$u(0, t) = 0, \quad u(1, t) = 0, \quad u(x, 0) = 2x$$

5. (20%) Solve the boundary value problem,

$$\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0, \quad \text{for } 0 < x < 1, 0 < y < \pi$$

$$u(0, y) = 0, \quad u(1, y) = \sin(y) \quad \text{for } 0 \leq y \leq \pi$$

$$u(x, 0) = 0, \quad u(x, \pi) = 0 \quad \text{for } 0 \leq x \leq 1$$