國　立　宜　蘭　大　學

100 學年度轉學招生考試

（考生填寫）
准考證號碼：

工　程　數　學　試　題

《作答注意事項》

1. 請先檢查准考證號碼、座位號碼及答案卷號碼是否相符。
2. 考試時間：80 分鐘。
3. 本試卷共有 5 題，一題 20 分，共計 100 分。
4. 請將答案寫在答案卷上。
5. 考試中禁止使用大哥大或其他通信設備。
6. 考試後，請將試題卷及答案卷一併繳交。

Using the method described only for each question.

1. (20%) What type of point about x at 0 and 2 for the following equation in the expansion of the power series? (Ordinary, regular singular, or irregular singular)

$$x\frac{d^2y}{dx^2}+(2-x)\frac{dy}{dx}-y=0$$

2. (20%) Find a general solution, $$\frac{dy}{dx}+\sin(\pi x)=0$$

3. (20%) Find a general solution, using the undetermined coefficients.

$$\frac{d^2y}{dx^2}+6\frac{dy}{dx}+73y=80e^x\cos(4x)$$

4. (20%) Find a general solution, using Laplace transform

$$\frac{d^2y}{dx^2}+2\frac{dy}{dx}+2y=0,\quad y(0)=1,\frac{dy(0)}{dx}=-3$$

5. (20%) Find the odd periodic extension of the following function, of period 2L

$$\begin{aligned} f(x)&= (2/L)x, && 0<x<L/2\\ &= (2/L)(L-x), && L/2<x<L \end{aligned}$$