

## 科目：工程數學(微分方程、傅立葉轉換、向量分析)

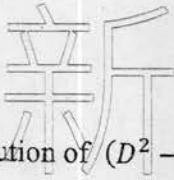
編號：391 適用：應光系

## 考生注意：

1. 依序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

本試題
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第 1 頁

(1) Find a general solution of  $x^2y'' - xy' + y = 0$   $y(1) = 1.5$   $y'(1) = 0.25$  (20 points)



(2) Find a general solution of  $(D^2 - 2D + 1)y = 35x^{3/2}e^x$  (20 points)

(3) Find a general solution of  $(x^2 + y^2)dx = 2xydy$  (20 points)



(4) Represent  $f(x)$  as a Fourier integral,  $f(x) = \begin{cases} \sin x, & \text{if } 0 < x < \pi \\ 0, & \text{if } x > \pi \end{cases}$   
(20 points)



(5) Find the Fourier cosine series and Fourier sine series of  $f(x)$ , where  $f(x) = \sin x$ ,  $0 < x < \pi$  (20 points)

