

科目：工程數學(微分方程)

適用：應光系三

考生注意：

1. 依次序作答，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。

編號：731

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1. For a linear differential equation, $y'' + ay' + by = 0$, please verify that its general solution is $y = e^{\frac{-ax}{2}} [A \cos(wx) + B \sin(wx)]$, in which $w = \sqrt{b - \frac{1}{4}a^2}$, assume $a^2 - 4b < 0$ (25 points)

2. Find the general solution of $x^2 y'' - 2y = 3x^2$ (25 points)

3. Find the general solution of $xy'' + 2y' + xy = 0$, given that $y_1 = x^{-1} \cos x$ (25 points)

4. Find the Laplace transform of $f(t)$, where $f(t) = \int_0^t (7 + 5e^{-4t}) dt$ (25 points)