

逢甲大學106學年度碩士班考試入學試題

編號：027

科目代碼：118

科目	工程數學	適用系所	自動控制工程學系	時間	90分鐘
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※請務必在答案卷作答區內作答。

共 1 頁 第 1 頁

1. Solve the differential equation $dy - (y - 1)^2 dx = 0$ by separation of variables. (15%)
2. Solve the initial-value problem $(e^x + y)dx + (2 + x + ye^y)dy = 0$; $y(0) = 1$ by exact differential method. (15%)
3. Solve the initial-value problem $y'' - 6y' + 9y = t^2 e^{3t}$; $y(0) = 2$, $y'(0) = 17$ by Laplace transform. (20%)
4. Evaluate the following integrals: (a) $\int_{-3}^3 x \sin\left(\frac{5\pi x}{3}\right) dx$ and (b) $\int_{-3}^3 |x| \sin\left(\frac{5\pi x}{3}\right) dx$. (20%)
5. Is the matrix $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$ diagonalizable? Explain your result. (15%)
6. Solve the differential equation $y'' - 2x^3 y = 0$ by using the power series method. (15%)