國立澎湖科技大學
100 學年度研究所入學考試試題

科目：工程數學

—作答注意事項—

考試時間：100 分鐘

作答方式：請用黑色或藍色筆在「答案卷」上作答

祝考試順利

國立澎湖科技大學 100 學年度研究所入學考試試題
電資研究所(電信組)

科目：工程數學

1. Solve $dx+e^{8x}dy=0$ by separation of variables. (12%)

2. Find the general solution of linear equation $x\frac{dy}{dx}-y=x^2 \sin x$, and give the largest interval over which the general solution is defined. (22%)

3. Solve $y''-5y'+4y=8e^x$ by undetermined coefficients. (22%)

4. Solve $y''+y'+y=x^2$ by inverse operators. (14%)

5. Let matrix $A=\begin{bmatrix} 1 & 0 \\ 1 & 2 \end{bmatrix}$. Find (a) the eigenvalues of **A**, (b) the eigenvectors of **A**, and (c) A^5. (12%)

6. If $\vec{v}=y\cdot\cos x\,\hat{i}+yz\,\hat{j}+e^x\,\hat{k}$, then find (a) $\nabla\cdot\vec{v}$, (b) $\nabla\times\vec{v}$. (10%)

7. Evaluate the line integral $\int_C f(x,y)ds$, which $f(x,y)=xy$ and C is a line $y=2x$ on the plane from A:(-1,-2,0) to B:(1,2,0). (8%)