

# 逢甲大學 95 學年度轉學生招生考試試題

科目	工程數學	適用系別	織複系三年級	時間	80 分鐘
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1. Two vectors  $\underline{a} = [1,2,3]$ ,  $\underline{b} = [2,3,4]$

(i) find  $\underline{a} \times \underline{b}$  (ii) find  $\underline{b} \cdot \underline{a}$

(iii) find the angle between  $\underline{a}$  and  $\underline{b}$  (15%)

2. Find the solution of the following equations by Gauss elimination method

$$\begin{cases} x_1 + x_2 + x_3 + x_4 = 4 \\ x_1 + 2x_2 + x_3 + x_4 = 5 \\ x_1 + 2x_2 + 2x_3 + 2x_4 = 7 \\ 2x_1 + x_2 + 2x_3 + 3x_4 = 8 \end{cases} \quad (15\%)$$

3.  $\underline{A} = \begin{bmatrix} 3 & 4 \\ 4 & -3 \end{bmatrix}$

(i) find  $\underline{A}^{-1}$

(ii) find the eigen values and eigen vectors of  $\underline{A}$  (20%)

4. Solve the differential equation:  $y' = (y-2)\cot x$  (15%)

5. Solve the initial value problem by the Laplace transform:

$$y'' + y = 2\cos t \quad y(0) = 3 \quad y'(0) = 4 \quad (25\%)$$

6. Evaluate  $[3(\cos 10^\circ + i \sin 10^\circ)] [4(\cos 20^\circ + i \sin 20^\circ)]$  (10%)