

# 東吳大學 114 學年度暑假轉學生招生考試試題

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系級	經濟學系三年級	考試時間	100 分鐘
科目	經濟數學	本科總分	100 分

※一律作答於答案卷上(題上作答不予計分)；並務必標明題號，依序作答。

1. Let  $AB = \begin{bmatrix} 2 & 1 \\ 0 & 3 \end{bmatrix}$  and  $C^T = \begin{bmatrix} -1 & 0 \\ 1 & 2 \end{bmatrix}$ . Please find  $CB^T A^T$ . (10 points)

2. Evaluate the double summation  $\sum_{x=1}^5 \sum_{y=0}^4 (4xy + 2x - 2y - 1)$ . (10 points)

3. Find the first three items of the Taylor series at  $x_0 = 1$  for function  $\frac{1}{x}$ . (10 points)

4. Let  $2^P = 3$ ,  $3^Q = 5$ ,  $5^R = 7$  and  $\log_a b = PQR$ . Please find a pair of  $(a, b)$ . (10 points)

5.  $A = \begin{bmatrix} 1 & -3 & -2 \\ -1 & 5 & 3 \\ 1 & -4 & -2 \end{bmatrix}$ , please find  $A^{-1}$ . (15 points)

6. Consider the problem:  $\min[(x-3)^2 + (y-3)^3]$  subject to  $x + y \leq 3$  and  $x + 3y \leq 6$ . Please list (no need to solve) the Kuhn-Tucker conditions. (15 points)

7. Let  $x^*(a)$  be the optimum of  $\max z(x; a) = x(a - 2x)^2$  and  $V(a) \equiv z(x^*(a); a)$ . Apply the Envelope theorem to derive  $\frac{dV(a)}{da}$ . (15 points)

8. Find  $\int_{-1}^0 x^2 e^{-x} dx$ . (15 points)