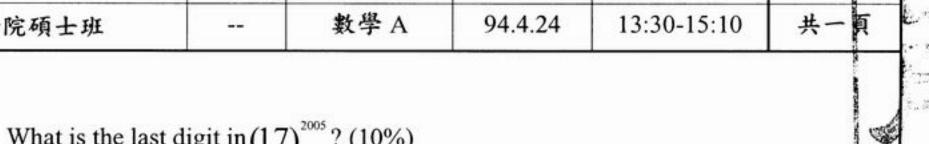
臺中健康暨管理學院

九十四學年度碩士班暨碩士在職專班招生考試試題纸

系 所 別	組別	考試科目	考試日期	時 間	備
資訊學院碩士班		数學 A	94.4.24	13:30-15:10	共一



- 1. What is the last digit in $(17)^{2005}$? (10%)
- 2. How many positive integers n less than 7200 satisfy gcd(n, 7200)=1, where gcd(x,y) denotes the greatest common divisor of x and y. (10%)
- 3. How many spanning trees does the complete bipartite $K_{2.9}$ have? (10%)
- 4. Given $f = \{(a,b), (b,a), (c,b)\}$, a function from $X = \{a, b, c\}$ to X: Define $f'' = f \circ f \circ ... \circ f$ to be n-fold composition of f with itself. Find f^{911} . (10%)
- 5. Find the number of solutions in integers to $x_1 + x_2 + x_3 = 15$ satisfying $0 \le x_1 < 6$, $1 \le x_2 < 9$, $x_3 \ge 0$. (10%)
- 6. Solve the recurrence relation $a_n = -2n a_{n-1} + 3n(n-1) a_{n-2}$ with initial conditions $a_0 = 1$, $a_1 = 2 \cdot (10\%)$
- 7. A connected, planar graph has nine vertices having degrees 2, 2, 2, 3, 3, 3, 4, 4, and 5. How many edges are there? How many faces are there? (10%)
- 8. Solve the pair of equations $x \equiv 1 \pmod{7} \text{ and } x \equiv 4 \pmod{11}. (10\%)$
- Compute the complete solution of the system

Ax=b with
$$A = \begin{bmatrix} 4 & 1 & 5 & 1 \\ 2 & 1 & 1 & -1 \\ 0 & 1 & -3 & -3 \end{bmatrix}$$
 and $b = \begin{pmatrix} 3 \\ 3 \\ 3 \end{pmatrix}$

What is the rank and the dimension of the nullspace of this matrix? (10%)

10. Compute the inverse of the matrix $\begin{bmatrix} 1 & 2 & 3 \\ -1 & 2 & 1 \\ 3 & 1 & 2 \end{bmatrix}$. (10%)