

亞洲大學

96 學年度轉學招生考試試題紙

學系別	考試科目	考試日期	時 間	備註
資訊工程學系三年級	離散數學(A)	96.07.23	08:20-10:00	共一頁
<p>1. Show that if five integers are selected from the first eight positive integers, there must be a pair of these integers with a sum equal to 9. (10%)</p> <p>2. Solve the recurrence relations $a_{n+1} - a_n = 2n + 3$ for $n \geq 0$, $a_0 = 1$. (10%)</p> <p>3. Find the coefficient of x^7 in the power series of $x^2/(1 + 2x)$. (10%)</p> <p>4. How many solutions are there to the equation $x_1 + x_2 + x_3 + x_4 + x_5 = 30$ where x_i, $i = 1, 2, 3, 4, 5$ is a nonnegative integer such that $x_i \geq 3$ for $i = 1, 2, 3, 4, 5$. (10%)</p> <p>5. Prove that for every positive integer n, $n^3 - n$ is divisible by 3. (10%)</p> <p>6. Let G be a simple graph with n vertices. Show that G is a tree if and only if G is connected and has $n - 1$ edges. (10%)</p> <p>7. (a) Prove that $\mathbf{P}(A) \cup \mathbf{P}(B) \subseteq \mathbf{P}(A \cup B)$ is true for all sets A and B. (10%) (b) Prove that the converse of (a) is not true. That is, prove that $\mathbf{P}(A \cup B) \subseteq \mathbf{P}(A) \cup \mathbf{P}(B)$ is false for some sets A and B. (10%)</p> <p>8. Let R_1, R_2 be symmetric relations on A. If $R_1 \circ R_2 \subseteq R_2 \circ R_1$, prove that $R_1 \circ R_2 = R_2 \circ R_1$. (10%)</p> <p>9. Show that $\binom{m+n}{r} = \sum_{k=0}^r \binom{m}{r-k} \binom{n}{k}$, where m, n, and r are nonnegative integers with $r \leq m$ and $r \leq n$. (10%)</p>				