

淡江大學 95 學年度進修學士班轉學生招生考試試題

系別：資訊工程學系三年級

科目：離散數學

10-1

准帶項目請打「V」

簡單型計算機

本試題共 1 頁

1. Determine the coefficient of

10% (a) $x^2 y^3 z^4$ in $(x+y+z)^9$

10% (b) $x^2 y^3 z^4 t^4$ in $(2x-y+3z-4t)^{10}$

2. Negate the following statement and simplify the result.

16%
$$P \wedge (P \rightarrow Q) \wedge (Q \rightarrow Y)$$

3. Determine the number of integer solutions of

16%
$$x_1 + x_2 + x_3 + x_4 + x_5 = 40, \text{ where } x_1, x_2 \geq 3, x_3, x_4 \geq 4$$

4. Solve the following recurrence relation.

16%
$$9a_{n+2} + 12a_{n+1} + 4a_n = 0, n \geq 0, a_0 = 1, a_1 = 4.$$

5. Show that for any $n \in \mathbb{Z}^+$, if $n > 9$, then

16%
$$n^3 < 2^n$$

6. Use generating function to derive the formula

16%
$$0^2 + 1^2 + 2^2 + \dots + n^2 = \frac{1}{6} n(n+1)(2n+1)$$