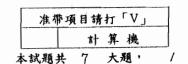
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## 淡江大學 98 學年度進修學士班轉學生招生考試試題

系別:資訊工程學系三年級

科目:離 散 數 學



1. Determine the number of integer solutions of  $x_1 + x_2 + x_3 + x_4 = 7$ , where  $x_i \ge 0$  for all  $1 \le i \le 4$ . (15%)

2. Consider the following C program segment, where i, j, and k are integer variables.

How many times is the printf() function executed in this program segment? (15%)

- 3. Prove that for every integer n, if n is odd, then  $n^2$  is odd. (15%)
- 4. Prove that if 101 integers are selected from the set  $S = \{1, 2, 3, ..., 200\}$ , then there are two integers such that one divides the other. (15%)
- 5. Solve the following recurrence relation:  $2a_{n+2} 11a_{n+1} + 5a_n$ ,  $n \ge 0$ ,  $a_0 = 2$ ,  $a_1 = -8$ . (15%)
- Since 1 = (1-x)(1+x+x²+x³+...), 1/(1-x) is the generating function for the sequence 1, 1, 1, 1, .... Find the generating function for the sequence 0, 1, 2, 3, 4, .... (15%)
- 7. Find the generating function for the number of ways to select 10 candy bars from large supplies of six different kinds. (10%)