CSC 2110 - Discrete Mathematics
Tutorial 6 - 18/Oct/2001

Question 1 (Ex 3.3 5)

Give a recursive definition of the sequence a_n, $n = 1, 2, 3, \ldots$ if

a) $a_n = 6n$

b) $a_n = 2n + 1$

c) $a_n = 10^n$

d) $a_n = 5$

Question 2 (Ex 3.3 23)

Give a recursive definition of

a) the set of even integers.

c) the set of positive integers not divisible by 5.

Question 3 (Example 4.1 14)

Each user on a computer system has a password, which is six to eight characters long, where each character is an uppercase letter or a digit. Each password must contain at least one digit. How many possible passwords are there?

Question 4 (Ex 4.1 19)

How many positive integers with exactly three decimal digits, that is, positive integers between 100 and 999 inclusive,

a) are divisible by 7?

b) are odd?

c) have the same three decimal digits?

d) are not divisble by 4?

e) are divisible by 3 or 4?

f) are not divisible by either 3 or 4?

g) are divisble by 3 but not by 4?

h) are divisble by 3 and 4?

Question 5 (Ex 4.6 13)

A book publisher has 3000 copies of a discrete mathematics book. How many ways are there to store these books in their three warehouses if the copies of the book are indistinguishable?

Question 6 (Ex 4.6 21)

How many positive integers less than 1,000,000 have the sum of their digits equal to 19?

Question 7 (Ex 4.6 35)

How many ways are there to travel in xyz space from the origin (0,0,0) to the point (4,3,5) by taking steps one unit in the positive x direction, one unit in the positive y direction, or one unit in the positive z direction? (Moving in the negative x, y, or z direction is prohibited, so that no backtracking is allowed.)