Discrete Mathematics Assignment

Assignment 2

1 a) True   d) False

   b) True   e) True

   c) False   f) False

2. If A is a subset of B, it means all members of A can be found in B. Also, if B is a subset of C, it means all the members of B including those of A are in C. Since all the members in C are found in C, it implies that A is a subset of C

3 a) 0   c) 2

   b) 1   d) 3

4. NOTE that Z is set of integers and R is set of real numbers

a) There exists an element x in R such that the cube of x is -1. This statement is true since $(-1)^3$ gives -1

   b) There exists an element x in Z such that the sum of the number and 1 is greater than the number. This statement is true because -3+1 which is -2 is greater than -3

   c) For any element x in Z, x-1 is also a member of Z. The statement is true. This is because 1 subtracted from any integer is still an integer.

   d) For any element x in Z, the square of x is also a member of Z. This is true because the square of any integer gives another integer.

5. a) If AUB =A, then it means B is a subset of A.

    b) If A-B =A, then A and B are disjoint.

    c) If A∩B=A, then B is the universal set which means A is a subset of B

    d) If A-B=B-A, then A and B are equal.

6. Given U= {1,2,3,4,5,6,7,8,9,10},

The bit strings of the sets are shown in the table below.

U	1	1	1	1	1	1	1	1	1	1

a. {3,4,5}	0	0	1	1	1	0	0	0	0	0
b. {1,3,6,10}	1	0	1	0	0	1	0	0	0	1
c. {2,3,4,7,8,9}	0	1	1	1	0	0	1	1	1	0

7. Using U= {1,2,3,4,5,6,7,8,9,10}

   a) 1111001111 = {1,2,3,4,7,8,9,10}

   b) 0101111000= {2,4,5,6,7}

   c) 10000000001= {1,10}

8. A_i = {...-2, -1,0,1,...,i}

a) {...-2, -1,0,1...}

b) {1}