Assignment-2

Question 1

A large software development company employs 100 computer programmers. Of them, 45 are proficient in Java, 30 in C#, 20 in Python, six in C# and Java, one in Java and Python, five in C# and Python, and just one programmer is proficient in all three languages above.

Determine the number of computer programmers that are not proficient in any of these three languages.

Question 2

let A, B, C be arbitrary sets:

1. Prove that *A* × (*B* − *C*) = (*A* × *B*) − (*A* × *C*).
2. Prove that A ∪ (B ∩ C) = (A ∪ B) ∩ (A ∪ C)

Question 3

Each of the following defines a relation on the set N of positive integers

R : x > y

S : x + y = l0

T : x + 4y = 10 for all (x, y) E N

Determine which of the relations are

(a) Reflexive (b) symmetric

(c) Transitive (d) ant symmetric

Question 4

Consider an algebraic system (G, \*), where G is the set of all non-zero real numbers and \* is a binary operation defined by a \* b = ab/4 Show that (G, \*) is an abelian group.

Question 5

1. If H and K are two subgroups of G then prove H ⋂ K is also a

Subgroup of G.

1. Suppose f:R→𝑅, 𝑔:𝑅→𝑅, where R is the set of real numbers given by

f(x) = 𝑥2−2 and g(x) = x+4.find fog and gof. State whether these functions are bijective or not.