## CHAPTER 1

## INTRODUCTION

The study of common fixed point of mappings satisfying some contractive type conditions has been at the centre of vigorous research activity and a number of interesting results have been obtained by various authors.

It is well known that in the setting of metric space, strict contractive condition do not ensure the existence of common fixed point unless the space is assumed compact or the strict condition are replaced by stronger conditions as in [6],[8] and [12].

In 1983 Brian Fisher [4], proved that if S and I are commuting mappings and T and J are commuting mappings of a complete metric space (X, d) into itself satisfying the inequality

 $d(Sx,Ty) \le c \cdot \max\{d(Ix,Jy), d(Ix,Sx), d(Jy,Ty)\}$ 

for all  $x, y \in X$ , where  $0 \le c < 1$ . And the range of I contains the range of T and the range of J contains the range of S and if one of S, T, I and J is continuous, then S, T, I and J have a unique common fixed point.

In 1986, Jungck [7], introduced the notion of compatible maps. This concept was frequently used to prove existence theorem in common fixed point theory.

In 2002, M.Aamri and D.El Moutawaki [1], gave some new common fixed point theorems under strict contractive conditions for mappings satisfying property(E.A).

Brian Fisher [5], 1981, studies a fixed point theorem for a composition of mappings  $T : X \to Y$  and  $S : Y \to X$ , where X and Y are complete metric spaces.

The purpose of this study is to extend many concepts and results of common fixed point of two and four mappings in metric spaces. These results generalize those in [1],[4] and [5].

This thesis contains 4 chapters. The introduction of this research is in Chapter 1.

In Chapter 2, we give some definitions, notations and results of metric spaces, fixed point of selfmapping and common fixed point of selfmapping in metric spaces.

The main result of the research is in Chapter 3 and the conclusion is in Chapter 4.



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