OUTLINE AND ORGANIZATION OF THE REPORT

This thesis is organized on the basis of experimental work carried out, in **Eight chapters**.

**Chapter 1** contains brief description of various concepts of fracture mechanics, introduction to polymer matrix composites, classification, types of fiber reinforcement, different particulate fillers in the thermoset polymer composites. Brief description of fracture mechanism and theories of fractures of fiber reinforced polymer composites is also discussed, experimental method of determining fracture toughness under different Modes are also discussed.

The **Second Chapter** highlights the literature review on fracture toughness of Fiber/ Filler reinforced polymer composites explained in four sections. Section 2.2 deals with the fracture toughness of particulate polymers. The review of rubber particles and micro sized inorganic particles and their influence on fracture toughness are presented. Section 2.3 deals with interlaminar fracture of fiber reinforced polymer composites. Both unidirectional and multidirectional fiber reinforcement influence on fracture are discussed. Interlaminar fracture of filled fiber reinforced polymer composites are found in section 2.4. The findings of intralaminar fracture toughness are also discussed in section 2.5.

The **Third Chapter** highlights the research problem, objectives and scope of present investigation.

The details of the material system and its fabrication methods, evaluation of physical properties like density and void fraction of filled and unfilled glass fabric reinforced polymer composites are found in **Chapter 4**.

**Chapter 5** covers the experimental investigation on mechanical properties of unfilled / filled fabric reinforced polymer composites.
Chapter 6 highlights the effect of various types of inorganic particles on Mode I intralaminar fracture toughness. The fracture surfaces are also examined by taking SEM micrographs and analyzed. The significant t-test is also conducted on experimental results.

The conclusions of the research work are drawn in Seventh Chapter and finally scope for future work is written in Chapter 8.