# CONTENTS

<table>
<thead>
<tr>
<th>LIST OF FIGURES</th>
<th>PAGE No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF TABLES</td>
<td></td>
</tr>
<tr>
<td>LIST OF GRAPHS</td>
<td></td>
</tr>
</tbody>
</table>

## CHAPTER - I  INTRODUCTION

| INTRODUCTION | 1 |
| TECHNOLOGY AND EDUCATION | 3 |
| EDUCATIONAL TECHNOLOGY | 4 |
| DEFINITIONS OF EDUCATIONAL TECHNOLOGY | 6 |
| MULTIMEDIA | 8 |
| CATEGORIZATION OF MULTIMEDIA | 8 |
| FEATURES OF MULTIMEDIA | 9 |
| MULTIMEDIA - ITS APPLICATIONS | 10 |
| INTELLIGENCE | 10 |
| THEORIES OF INTELLIGENCE | 11 |
| OBJECTIVES OF TEACHING PHYSICS AT HIGHER SECONDARY STAGE | 13 |
| NEED FOR ALTERNATIVE STRATEGIES IN TEACHING PHYSICS | 16 |
| NEED FOR THE STUDY | 17 |
| STATEMENT OF THE PROBLEM | 18 |
| SCOPE OF THE STUDY | 18 |
| OBJECTIVES OF THE STUDY | 20 |
| HYPOTHESES | 22 |
| TOOLS USED IN THE STUDY | 24 |
| METHODOLOGY IN BERIEF | 26 |
| DELIMITATIONS OF THE STUDY | 27 |
| A BRIEF RESUME OF THE SUCCEEDING CHAPTERS | 28 |
CHAPTER - 11 MULTIMEDIA : A CONCEPTUAL FRAMEWORK

COMPUTER - INTRODUCTION 30
COMPUTERS IN EDUCATION 30
COMPUTER MANAGED LEARNING (CML) 31
COMPUTER ASSISTED INSTRUCTION (CAI) 32
COMPUTER ASSISTED LEARNING (CAL) 33
INTERACTIVE MULTIMEDIA LESSONS FOR EDUCATION - INTRODUCTION 36
MULTIMEDIA MODULE COMPONENTS 37
  Content 37
  Multimedia Asset Development 39
  Computer Graphics Production 39
  Video Production 41
  Sound Production 42
  File format Conversion 43
  Authering system Integration 43
  Computer Animation Technology 44
  Principles of Animation 45
  Design of Animation Sequences 46
  Conventional Animation 47
  Computer Assisted Animation 48

ROLE OF MULTIMEDIA BASED COMPUTER ANIMATION COURSEWARE IN SCHOOLS. 48

CONCLUSION 49

CHAPTER - 111 REVIEW OF RELATED LITERATURE

INTRODUCTION 50
STUDIES ON COMPUTER ASSISTED INSTRUCTION 51
SUMMARY 69
CHAPTER - IV METHODOLOGY

INTRODUCTION 84

MULTIMEDIA BASED COMPUTER SOFTWARE IN PHYSICS 85

TUTORIAL INSTRUCTION ALGORITHM 86

Characteristics of Tutorials 87
Pedagogical principles involved in the Tutorials 87

THEORETICAL CONCEPTIONS ABOUT A GOOD SOFTWARE 89

DEVELOPMENT OF TUTORIAL PACKAGES 92

COMPUTER COURSEWARE EVALUATION 96
Development of Courseware Evaluation Proforma 97

VALIDATION OF THE SOFTWARE PACKAGES 101

DEVELOPMENT OF CRITERION - REFERENCED TEST IN PHYSICS 103

Advantages of CRT over Norm Referenced Tests 105
Applications of CRTs 106
Steps involved in the development of CRT 107
Reliability and Validity of the CRT in Physics 110

OTHER TOOLS USED IN THE STUDY 112
CFIT Scale 3 Form A 112
Pre - Test 114

PROCEDURE 115
Experimental Research 115
Pre - test, Post - test, Non - equivalent Groups Design 116

SAMPLING 117

ADMINISTRATION OF THE PRE - TEST 118
CHAPTER V  ANALYSIS AND INTERPRETATIONS OF DATA

INTRODUCTION  123

ESTABLISHING IDENTITY AMONG
CONTROL AND EXPERIMENTAL GROUPS  123

TESTING OF HYPOTHESES  124

NULL HYPOTHESIS : 1  125
NULL HYPOTHESIS : 2  126
NULL HYPOTHESIS : 3  127
NULL HYPOTHESIS : 4  133
NULL HYPOTHESIS : 5  135
NULL HYPOTHESIS : 6  136
NULL HYPOTHESIS : 7  137
NULL HYPOTHESIS : 8  138
NULL HYPOTHESIS : 9  139
NULL HYPOTHESIS : 10  140
NULL HYPOTHESIS : 11  141
NULL HYPOTHESIS : 12  142
NULL HYPOTHESIS : 13  143
NULL HYPOTHESIS : 14  145
NULL HYPOTHESIS : 15  146
NULL HYPOTHESIS : 16  150