M S Ramaiah Institute of Technology

Department of Computer Applications

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| **Course code:** **MCA13**  **Course name: Fundamentals of Computer Organisation** |

| **Lesson No -Session No** | **Topics** | **No. of hrs** |
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| 1. | **Digital Systems and Binary Systems :** Digital Systems | 1 |
| 2. | Binary Numbers | 1 |
| 3. | Number Base Conversion | 1 |
| 4. | Number Base Conversion | 1 |
| 5. | Octal and Hexadecimal Numbers | 1 |
| 6. | Complements | 1 |
| 7. | Signed Binary Numbers | 1 |
| 8. | Binary Codes | 1 |
| 9. | Subtraction using complements | 1 |
| 10. | Binary Storage and Registers | 1 |
| 11. | Binary Logic | 1 |
| 12. | **Boolean Algebra and Logic Gates :** Introduction | 1 |
| 13. | Basic Definitions | 1 |
| 14. | Axiomatic Definition of Boolean Algebra | 1 |
| 15. | Basic Theorems and Properties of Boolean Algebra | 1 |
| 16. | Basic Theorems and Properties of Boolean Algebra | 1 |
| 17. | Boolean Functions | 1 |
| 18. | Canonical and Standard Forms | 1 |
| 19. | Other Logic Operations | 1 |
| 20. | Digital Logic Gates | 1 |
| 21. | **Gate-Level Minimization:** Introduction | 1 |
| 22. | The Map Method | 1 |
| 23. | Four-Variable Map | 1 |
| 24. | Product of Sums Simplification | 1 |
| 25. | Don’t-Care Conditions | 1 |
| 26. | Adder, Subtractor, Encoder, Decoder | 1 |
| 27. | Flip-flop, Registers, Counters | 1 |
| 28. | **Basic Structure of Computers**: Computer Types | 1 |
| 29. | Functional Units | 1 |
| 30. | Basic Operational Concepts, Bus structures | 1 |
| 31. | **Machine Instructions and Programs:** Memory Location and Addresses | 1 |
| 32. | Memory Operations | 1 |
| 33. | Instructions & Instruction Sequencing | 1 |
| 34. | Addressing Modes | 1 |
| 35. | Addressing Modes | 1 |
| 36. | Assembly Language | 1 |
| 37. | Basic Input/output Operations | 1 |
| 38. | Additional Instructions | 1 |
| 39. | **Input/Output Organization** : Accessing I/O Devices | 1 |
| 40. | Interrupts | 1 |
| 41. | Direct Memory Accesses | 1 |
| 42. | Buses | 1 |
| 43. | **Memory:** Basic concepts | 1 |
| 44. | Semiconductors RAM Memories | 1 |
| 45. | Read-Only Memories | 1 |
| 46. | Cache Memories | 1 |
| 47. | Mapping Functions | 1 |
| 48. | **Arithmetic Unit** : Addition & subtraction of Signed Numbers | 1 |
| 49. | Addition & subtraction of Signed Numbers | 1 |
| 50. | Design of Fast adders | 1 |
| 51. | Multiplication of Positive Numbers | 1 |
| 52. | Multiplication of Positive Numbers | 1 |
| 53. | Signed-Operand Multiplication | 1 |
| 54. | Fast Multiplication | 1 |
| 55. | Integer division | 1 |
| 56. | Floating-Point Numbers & Operations | 1 |

**Text Book:**

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|  | 1. M. Morris Mano, Digital Logic and Computer Design, 4th Edition, Pearson Education, 2008.   Chapters: 1.1.to 1.7, 2.1 to 2.8, 3.1 to 3.3, 3.5,3.6,  Only definitions from (4.2, 4.5, 4.9 to 4.11, 5.2, 5.4, 6.1, 6.2, 6.3)   1. Carl Hamacher, Z Varnesic and S Zaky , Computer Organization, 5th Edition, McGraw Hill, 2002.   Chapters: 1.1 to 1.4, 2.2 to 2.7, 2.10, 4.1, 4.2, 4.4 to 4.5, 5.1 to 5.3, 5.5, 6.1 to 6.6, 6.7.1, 6.7.2, 6.7.3. |