MCA – 15 Digital Computer system Architecture

Examination Scheme					
Internal		**External**		**Total**	
Th. (Marks)	Pr. (Marks)	Th. (Marks)	Pr. (Marks)	Th. (Marks)	Pr. (Marks)
30	--	70	--	100	--

UNIT – I **(25%)**

Data Representation, Number System :

Representation of numbers (Only for Introduction), Decimal, Binary, Octal, Hexadecimal number systems), Conversation of number from one number system to another, Binary to Decimal, Decimal to Binary, Octal to Decimal, Decimal to Octal, Octal to Binary, Binary to Octal, Hexadecimal to Binary, Binary to Hexadecimal, Hexadecimal to Decimal, Decimal to Hexadecimal, Hexadecimal to Octal, Octal to Hexadecimal.

Binary Arithmetic : Addition, Subtraction, (Simple method, using 1's and 2's complement method)

Binary Codes : Weighted BCD Code (Only 8421), Non-weighted Codes, Error Detecting Codes, Fixed and Floating Point Representation,

(Book : 2.1 to 2.12.7, Book : 5 – 3.2 to 3.4, Book : 1 – 3.3 & 3.4)

UNIT – II **(25%)**

Basic of Digital Computers :

Digital Logic Circuits, Digital Computers, Logic Gates, Boolean algebra, Map Simplification. **Digital Circuits Design – 1,** Combination Circuits, Flip-Flop, Sequential Circuits, **Digital Circuits Design – 2,** Integrated Circuits, Decoders, Multiplexers, Registers, Counters,

(Book : 1 – 1.1 to 1.7, 2.1, Book: 4 – 3.1, 3.3, 10.1 to 10.5, 11.1, 11.3 (Excludes : Timing Diagram, TTL Devices and Detailed circuits of Registers)

UNIT – III **(25%)**

Memory, Micro Operations and Addressing Techniques :

Memory Unit – Random Access Memory, Read Only Memory, Types of RAM and ROMs **Micro Operations** – Arithmetic Micro Operations, Logical Micro Operations, Shift Micro Operations, Arithmetic Logic shift Unit.

Addressing Techniques – Instruction Format, Immediate Addressing, Direct Addressing Register Indirect Addressing, Register Addressing, Implicit Addressing.

(Book : 7 – 9.1 to 9.3, Book : 1 – 4.4 to 4.7, Book : 2 – 4.2, 4.3)

UNIT – IV **(25%)**

Programming Techniques :

Introduction, Instruction Code, Computer Registers.

Computer Instructions : Data transfer and I/O Instructions, Arithmetic Instructions, Logic Instructions, Branch Instructions.

(Book : 1 – 5.1, 5.2, Book : 6 – 6.1 to 6.4)

Books :

1. Computer System Architecture by M.Morris Mano – 3rd Edition – PHI.
2. Fundamentals of Microprocessor and Microcomputers by B. RAM – 4th Edition – Dhanpat Rai Publications.
3. Structure computer Organization by Andrew S. Athemaeum – 4th Edition – PHI.
4. Digital Principles and Applications by Malvino & Leach – 4th Edition – McGraw Hill.
5. Digital Electronics by William H. Gothmann – 2nd Edition - PHI.

6. Microprocessor Architecture Programming and Application by Ramesh S. Gaonkar – Wiley Eastern Limited.
7. Digital Computer Electronics by Malvino & Brown – 3rd Edition – TMH.
8. Fundamentals of Computers by V. Rajaraman – 3rd Edition – PHI.

Question Paper Scheme :

Section – I

Q.1 Objective Type Unit I & II (11) Marks
Q.2 Unit – I **OR** Q.2 Unit – I (12) Marks
Q.3 Unit – II **OR** Q.3 Unit – II (12) Marks

Section – II

Q.4 Objective Type Unit III & IV (11) Marks
Q.5 Unit – III **OR** Q.5 Unit – III (12) Marks
Q.6 Unit – IV **OR** Q.6 Unit – IV (12) Marks