Digital Fundamentals & Architecture (DFA) – Important Questions

UNIT 1 – Number System and Arithmetic Circuits
2/3 Marks: Decimal, Binary, Octal, Hexadecimal number systems, Binary addition, Complements, BCD, Excess-3, Gray code, Half adder, Full adder, Logic gates.

5/10 Marks: Conversion between number systems, Binary arithmetic, Floating point representation, Complements, Code conversions, Half & Full adder, Parallel binary adder, Subtractors, NAND, NOR, XOR gates.

UNIT 2 – Combinational Logic and Sequential Circuits
2/3 Marks: Boolean algebra laws, K-map, SOP, POS, Flip-flops, Multiplexer, Decoder, Shift registers, Counters.

5/10 Marks: Boolean algebra, Karnaugh map simplification, Canonical forms, Combinational circuits, RS, D, JK, T flip-flops, Multiplexers & Demultiplexers, Counters and Shift registers.

UNIT 3 – Input Output Organization and Data Transfer
2/3 Marks: I/O interface, I/O bus, Memory-mapped I/O, Strobe control, Handshaking, DMA, Interrupts.

5/10 Marks: I/O organization, Isolated vs Memory-mapped I/O, Asynchronous data transfer, Priority interrupts, DMA controller and transfer, CPU–IOP communication.

UNIT 4 – Memory Organization
2/3 Marks: Memory hierarchy, Main memory, Cache memory, Virtual memory, Page table.

5/10 Marks: Memory hierarchy, Associative memory, Cache mapping techniques, Cache write policies, Virtual memory, Paging, Page replacement techniques.

UNIT 5 – Case Studies
5/10 Marks: Architecture and features of 80286, 80386, 80486 processors, Pin diagram, Addressing modes, Introduction to microcontrollers.