34043 DIGITAL ELECTRONICS

DETAILED SYLLABUS

UNIT 1 NUMBER SYSTEM AND BOOLEAN ALGEBRA

Binary, Octal, Decimal, Hexadecimal - Conversion from one to another. Binary codes – BCD code, Gray code, Excess 3 code. Boolean algebra- Boolean postulates and laws- De-Morgan's theorem- Simplification of Boolean expressions using Karnaugh map (up to 4 variables-pairs, quad, octets) - Don't care conditions and constructing the logic circuits for the Boolean expressions.

LOGIC GATES AND DIGITAL LOGIC FAMILIES:

Gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR - Implementation of logic functions using gates - Realization of gates using universal gates- Simplification of expression using Boolean techniques- Boolean expression for outputs. Digital logic families –Fan in, Fan out, Propagation delay - TTL, CMOS Logics and their characteristics - comparison and applications -Tristate logic.

UNIT II COMBINATIONAL CIRCUITS

Arithmetic circuits - Binary – Addition, subtraction, 1's and 2's complement - Signed binary numbers- Half Adder- Full Adder- Half Subtractor - Full Subtractor- Parallel and serial Adders- BCD adder. Encoder and decoder – 3 to 8 decoder, BCD to seven segment decoder- Multiplexer- basic 2 to 1 MUX, 4 to 1 MUX, 8 to 1 MUX - applications of the MUX – Demultiplexer - 1 to 2 demultiplexer, 1 to 4 demultiplexer, 1 to 8 demultiplexer - Parity Checker and generator.

UNIT III SEQUENTIAL CIRCUITS

FLIP FLOPS – SR, JK, T, D FF, JK- MS FF - Triggering of FF – edge & level, Counters – 4 bit Up - Down Asynchronous / ripple counter - Decade counter- Mod 3, Mod 7 counter. 4 bit Synchronous Up - Down counter - Johnson counter, Ring counter

REGISTERS

4-bit shift register- Serial IN Serial OUT- Serial IN Parallel OUT - Parallel IN Serial OUT- Parallel IN Parallel OUT

UNIT IV MEMORY DEVICES

Classifications of memories - RAM organization - Address Lines and Memory Size- Read /write operations- Static RAM - Bipolar RAM cell- Dynamic RAM- SD RAM- DDR RAM. Read only memory – ROM organization- Expanding memory- PROM- EPROM- and EEPROM - Flash memory- Anti Fuse Technologies.

UNIT V MICROPROCESSOR – 8085

Evolution of microprocessor 8085 – Architecture of 8085- Instruction sets- Addressing modes - Memory mapped I/O and I/O mapped I/O and its Comparison. Machine cycle – Opcode fetch - memory read- memory write- I/O read, I/O write - Instruction cycle (Timing diagram) for MOV r1, r2 instruction. Interrupts (types & Priorities)

REFERENCE BOOKS:

1. Principles of Digital Electronics K.Meena PHI – 2011

2. Modern Digital Electronics R.P.Jains TMH -2003

3. Microprocessor architecture programming and application Ramesh S.Gaonkar, Wiley Eastern Limited.

4. Digital principles & Applications Albert Paul Malvino & Donald P.Leach TMH - 4th Edition 2002

5. Digital Electronics William H.Gothmann prentice Hall of India – 2nd Edition, 1995