3ITU01 ELECTRONIC DEVICES & CIRCUITS

MAX_MARKS(50+100)

Objectives:

To acquaint the students with construction, theory and characteristics of the following electronic devices:

1. p-n junction diode
2. Bipolar transistor
3. Field effect transistor
4. LED, LCD and other photo electronic devices
5. Power control / regulator devices

Syllabus:

Mobility and conductivity, charge densities in a semiconductor, Fermi Dirac distribution,carrier concentrations and fermi levels in semiconductor, Generation and recombination of charges, diffusion and continuity equation, Mass action Law, Hall effect, Junction diodes, Diode as a ckt. element, load line concept, clipping and clamping circuits, Voltage multipliers.

Transistor characteristics, Current components, Current gains: alpha and beta. Operating point. Hybrid model, h-parameter equivalent circuits. CE, CB and CC configuration. DC and AC analysis of CE,CC and CB amplifiers. Ebers-Moll model. Biasing & stabilization techniques. Thermal runaway, Thermal stability.

SMALL SIGNAL AMPLIFIERS AT LOW FREQUENCY : Analysis of BJT and FET, RC coupled amplifiers. Frequency response, midband gain, gains at low and high frequency. Miller's Theorem. Cascading Transistor amplifiers, Emitter follower. JFET, MOSFET, Equivalent circuits and biasing of JFET's & MOSFET's. Low frequency CS and CD JFET amplifiers. FET as a voltage variable resistor. Source follower.

FEEDBACK AMPLIFIERS : Classification, Feedback concept, Transfer gain with feedback, General characteristics of negative feedback amplifiers. Analysis of voltageseries, voltage-shunt, current- series and current-shunt feedback amplifier. Stability criterion.

OSCILLATORS : Classification. Criterion for oscillation. Tuned collector, Hartley, Colpitts, RC Phase shift, Wien bridge and crystal oscillators, Astable, monostable and bistable multivibrators. Schmitt trigger.

Text/References:

1. Electronic devices & circuits theory By R.L. Boylestad, Louis Nashelsky ,Pearson education
2. Integrated Electronics By Millman Halkias, T.M.H
3. Electronic devices & circuits By David Bell, Oxford Publications

23/11/16 23/11

3ITU02 DATA STRUCTURES & ALGORITHMS

MAX_MARKS(50+100)

Objectives:

1. To study various data structure concepts like Stacks, Queues, Linked List, Trees and Files.
2. To overview the applications of data structures.
3. To be familiar with utilization of data structure techniques in problem solving.
4. To have a comprehensive knowledge of data structures and relevant algorithms.
5. To carry out asymptotic analysis of any algorithm

Syllabus:

Asymptotic notations: Concept of complexity of program, Big-Oh, theta, Omega- Definitions and examples, Determination of time and space complexity of simple algorithms without recursion. Representing a function in asymptotic notations viz $5n^2-6n=\theta(n^2)$

Linear Data Structures: Array as storage element, Row major & column major form of arrays, computation of address of elements of n dimensional array. Arrays as storage elements for representing polynomial of one or more degrees for addition & multiplication, sparse matrices for transposing & multiplication, stack, queue, dequeue, circular queue for insertion and deletion with condition for over and underflow, transposition of sparse matrices with algorithms of varying complexity (Includes algorithms for operations as mentioned).

Evaluation of Expression: Concept of precedence and associativity in expressions, difficulties in dealing with infix expressions, Resolving precedence of operators and association of operands, postfix & prefix expressions, conversion of expression from one form to other form using stack (with & without parenthesis), Evaluation of expression in infix, postfix & prefix forms using stack. Recursion.

Linear linked lists: singly, doubly and circularly connected linear linked lists- insertion, deletion at/ from beginning and any point in ordered or unordered lists. Comparison of arrays and linked lists as data structures.

Linked implementation of stack, queue and dequeue. Algorithms for of insertion, deletion and traversal of stack, queue, dequeue implemented using linked structures. Polynomial representation using linked lists for addition, Concepts of Head Node in linked lists.

Searching: Sequential and binary search