

ANNA UNIVERSITY TIRUCHIRAPPALLI

Tiruchirappalli - 620 024

Syllabus

B.E. Computer Science and Engineering SEMESTER III

MATHEMATICS III (Common to all branches)

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UNIT I PARTIAL DIFFERENTIAL EQUATIONS 9

Formation of Partial Differential Equations by Elimination of Arbitrary Constants and Arbitrary Functions – Solution of Standard Types of First Order Partial Differential Equations – Lagrange’s Linear Equation – Linear Partial Differential Equations of Second and Higher Order with Constant Coefficients.

UNIT II FOURIER SERIES 9

Dirichlet’s Conditions – General Fourier Series – Odd and Even Functions – Half Range Sine Series – Half Range Cosine Series – Complex form of Fourier Series – Parseval’s Identity – Harmonic Analysis.

UNIT III BOUNDARY VALUE PROBLEMS 9

Classification of Second Order Quasi Linear Partial Differential Equations – Solutions of One Dimensional Wave Equation – One Dimensional Heat Equation – Steady State Solution of Two-Dimensional Heat Equation (Insulated Edges Excluded) – Fourier Series Solutions in Cartesian Coordinates.

UNIT IV FOURIER TRANSFORM 9

Fourier Integral Theorem (without proof) – Fourier Transform Pair – Sine and Cosine Transforms – Properties – Transforms of Simple Functions – Convolution Theorem – Parseval’s Identity.

UNIT V Z -TRANSFORM AND DIFFERENCE EQUATIONS 9

Z-Transform – Elementary Properties – Inverse Z-Transform – Convolution Theorem – Formation of Difference Equations – Solution of Difference Equations Using Z-Transform.

L: 45 T: 15 Total 60

TEXT BOOK

1. Grewal B.S., “Higher Engineering Mathematics”, Fortieth Edition, Khanna Publishers, 2007.

REFERENCES

1. Churchill R.V. and Brown J.W., “Fourier Series and Boundary Value Problems”, Fourth Edition, McGraw-Hill Book Co., 1987.
2. Veerarajan .T, “Engineering Mathematics III”, Third Edition, Tata McGraw-Hill Education, 2007.
3. Kandasamy P., Thilagavathy K. and Gunavathy K., “Engineering Mathematics Volume III”, S. Chand & Company Ltd., 1996.

DATA STRUCTURES

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UNIT I PROBLEM SOLVING 9

Problem Solving – Top-down Design – Implementation – Verification – Efficiency – Analysis – Sample Algorithms.

UNIT II LISTS - STACKS AND QUEUES 8

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

UNIT III TREES 10

Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple Implementations – Binary Heap

UNIT IV SORTING 9

Insertion Sort–Shell Sort – Heap Sort – Merge Sort – Quick Sort – External Sorting

UNIT V GRAPHS 9

Topological Sort – Shortest Path Algorithms – Unweighted Shortest Paths – Dijkstra’s Algorithm – Minimum Spanning Tree – Prim’s Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP Completeness

L: 45 T: 15 Total: 60

TEXT BOOKS

1. R. G. Dromey, “How to Solve it by Computer” (Chapters 1 -2), Prentice-Hall of India, 2002.
2. M. A. Weiss, “Data Structures and Algorithm Analysis in C”, Pearson Education, Second Edition, 2002.

REFERENCES

1. Y. Langsam M. J. Augenstein and A. M. Tenenbaum, “Data Structures using C”, Pearson Education, 2004
2. Richard F. Gilberg, Behrouz A. Forouzan, “Data Structures - A Pseudocode Approach with C”, Thomson Brooks / COLE, 1998.
3. Aho J. E. Hopcroft and J. D. Ullman, “Data Structures and Algorithms”, Pearson education, 1983.
4. Harowitz, Sahani, Anderson-Freed, “Fundamentals of Data Structures in C”, Second Edition, Universities Press, 2007.

ELECTRONIC DEVICES AND CIRCUITS

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UNIT I ELECTRON BALLISTICS AND APPLICATIONS 9

Force on charged particles in an electric field – magnetic field – calculation of electrostatic and magnetic deflection sensitivity in cathode ray tube – analysis of parallel and perpendicular electric and magnetic fields – cyclotron – energy band structure of conductors – intrinsic and extrinsic semiconductor – N and P type – insulators – Hall effect.

UNIT II SEMICONDUCTOR DIODES 9

PN junction – derivation of diode equation – current components – switching characteristics of diode – common diode applications – characteristics and applications of Varactor diode and Zener diode – Mechanism of Avalanche and Zener breakdown – backward diode – tunnel diode – PIN diode – point contact diode – Schottky barrier diode – photo diode – APD – light emitting diodes.

UNIT III BIPOLAR JUNCTION TRANSISTORS AND FIELD EFFECT TRANSISTORS 9

Bipolar junction transistor – PNP and NPN action – current components – Eber-Moll model – transistor switching times – comparison of CE, CB and CC configuration – BJT applications – construction and characteristics of JFET – Relation between Pinch-off voltage and Drain current – MOSFET – enhancement and depletion types – MESFET – introduction to VMOS and CMOS devices.

UNIT IV TRANSISTOR BIASING 9

BJT – operating point – need for biasing – various biasing methods of BJT – bias stability – stability parameters – biasing methods of FET – use of JFET as a voltage variable resistor (VVR).

UNIT V POWER SUPPLY AND POWER AMPLIFIERS 9

Basic Elements of Regulated Power Supply System – Stabilization – Series and Shunt Voltage Regulators – General purpose and Monolithic Linear Regulators – Switching Regulators. Classification of Power Amplifiers (Class A, B, AB, C&D) – Efficiency of Class A – RC Coupled and Transformer – Coupled Power Amplifiers – Class B Complementary-Symmetry – Push-Pull Power Amplifiers.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Jacob Millman & Christos C.Halkias, “Electronic Devices and Circuits” Tata McGraw–Hill, 1991.
2. Robert T.Paynter, Introductory Electronic Devices and Circuits, Pearson Education, Seventh Edition, 2006.

REFERENCES

1. Boylestad ,R.L and Nashelsky,L, ”Electronic Devices and Circuit Theory”, Pearson Education,1997
2. Donald A.Neaman, ” Semiconductor Physics and Devices” Third Edition, Tata McGraw-Hill, 2002.
3. S.Salivahanan, N.Sureshkumar and A.Vallavaraj, “Electronic Devices and Circuits”, TMH, 1998.

COMPUTER ARCHITECTURE

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UNIT I	BASIC STRUCTURE OF COMPUTERS	9
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Functional Units – Basic Operational Concepts – Bus Structures – Software Performance – Memory Locations and Addresses – Memory Operations – Instruction and Instruction Sequencing – Addressing Modes – Assembly Language – Basic I/O Operations – Stacks and Queues.

UNIT II	ARITHMETIC UNIT	9
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Addition And Subtraction of Signed Numbers – Design of Fast Adders – Multiplication of Positive Numbers – Signed Operand Multiplication – Fast Multiplication – Integer Division – Floating-Point Numbers and Operations.

UNIT III	BASIC PROCESSING UNIT	9
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Fundamental Concepts – Execution of a Complete Instruction – Multiple Bus Organization – Hardwired Control – Microprogrammed Control – Pipelining – Basic Concepts – Data Hazards – Instruction Hazards – Influence on Instruction Sets – Data Path and Control Consideration – Superscalar Operation – Performance Considerations.

UNIT IV	I/O ORGANIZATION	9
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Accessing I/O Devices – Interrupts – Direct Memory Access – Buses – Interface Circuits – Standard I/O Interfaces (PCI - SCSI - USB).

UNIT V	MEMORY SYSTEM	9
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Memory Concepts – Semiconductor RAMs – ROMs – Speed, Size and Cost – Cache Memories – Performance Considerations – Virtual Memories – Memory Management Requirements – Secondary Storage.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, “Computer Organization”, Fifth Edition, McGraw-Hill, 2002.

REFERENCES

1. William Stallings, “Computer Organization and Architecture: Designing for Performance”, Sixth Edition, Pearson Education, 2003.
2. David A Patterson and John L.Hennessy, “Computer Organization and Design The hardware / software interface”, Second Edition, Morgan Kaufmann, 2002.
3. John P Hayes, “Computer Architecture and Organization”, Third Edition, McGraw-Hill, 1998.

OBJECT ORIENTED PROGRAMMING

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UNIT I FUNDAMENTALS

9

Object–Oriented Programming Concepts – Encapsulation – Programming Elements – Program Structure – Enumeration Types — Functions and Pointers – Function Invocation – Overloading Functions – Scope and Storage Class – Pointer Types – Arrays and Pointers – Call-by-Reference – Assertions – Standard template library.

UNIT II IMPLEMENTING ADTS AND ENCAPSULATION

9

Aggregate Type struct – Structure Pointer Operators – Unions – Bit Fields – Data Handling and Member Functions – Classes – Constructors and Destructors – Static Member – this Pointer – Reference Semantics – Implementation of simple ADTs.

UNIT III POLYMORPHISM

9

ADT Conversions – Overloading – Overloading Operators – Unary Operator Overloading – Binary Operator Overloading – Function Selection – Pointer Operators

UNIT IV INHERITANCE

9

Derived Class – Typing Conversions and Visibility – Code Reuse – Virtual Functions – Run-Time Type Identifications –Exceptions – Handlers – Standard Exceptions.

UNIT V TEMPLATES AND FILE HANDLING

9

Template Class – Function Templates – Class Templates – C++ Streams – Console Streams – Console Stream Classes – Formatted and Unformatted Console I/O Operations – Manipulators – File Streams – Classes File Modes – File Pointers and Manipulations – File I/O – Exception Handling.

Total: 45

TEXT BOOKS

1. Ira Pohl, “Object–Oriented Programming Using C++”, Pearson Education, Second Edition, 2003.
2. K.R.Venugopal, Rajkumar Buyya and T.Ravishankar, “Mastering C++”, TMH, 2003 .

REFERENCES

1. Ashok N.Kamthane, “Object-Oriented Probramming with ANSI and Turbo C++”, Pearson Education,2006.
2. Bjarne Stroustrup, “The C++ programming language”, Addison Wesley, 2000.
3. John R.Hubbard, “Progranning with C++”, Schaums outline series, TMH, 2003.

ELECTRICAL ENGINEERING AND CONTROL SYSTEMS

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UNIT I ELECTRIC CIRCUITS 9

Basics of Electricity – Electric Energy and Power – Circuit Elements and Sources – Kirchoff’s Laws – Series and Parallel Combination of Resistances – Mesh Analysis – Nodal Analysis – Superposition Theorem – Thevenin’s Theorem – Norton’s Theorem – Maximum Power Transfer Theorem.

UNIT II STEADY STATE ANALYSIS OF SINUSOIDAL EXCITATION 9

Sinusoidal Excitation – RMS – Average – Peak Values – Phasor Representation – RC, RL and RLC Circuits – Complex Power – Resonance – Three Phase Circuits – Line and Phase Values.

UNIT III D.C.MACHINES AND TRANSFORMER 9

D.C. Machines – Constructional features – EMF and Torque – Circuit Model – Characteristics of D.C. Motors – Speed Control – Transformers – Constructional Features – Transformer Operation – Voltage Regulation – Efficiency.

UNIT IV A.C.MACHINES 9

Alternators – Principles of Operations – Synchronous Machines – Circuit Model – Armature Leakage Reactance – Synchronous Reactance – Voltage Regulation – Induction Machines – Construction – Circuit Model – Power Across Airgap, Torque and Power Output – Torque–Slip Characteristic – Starting Arrangements – Speed Control of Induction Motor – Single Phase Induction Motors – A.C. Series Motor.

UNIT V CONTROL SYSTEMS 9

Introduction to Control Systems – Closed Loop Control – Examples – Mathematical Models of Simple Physical Systems – Transfer Function – Control Components – D.C. & A.C. Servo motors – Potentiometers – Stepper Motors – Time Response of First and Second Order Systems.

Total: 45

TEXT BOOKS

1. D.P.Kothari and I.J.Nagrath, “Basic Electrical Engineering”, Second Edition, Tata McGraw Hill, 2002.
2. I.J. Nagrath and M. Gopal, “Control Systems Engineering”, New Age International Publishers, 2007.

REFERENCES

1. B.L. Theraja and A.K. Theraja, “A Textbook of Electrical Technology”, Volume I & II, S.Chand, 2005
2. Naresh K. Sinha, “Control Systems”, Revised Third Edition, New Age International Publishers, 1998

Implement the following exercises using C

1. Array Implementation of List ADT
2. Linked List Implementation of List ADT
3. Cursor Implementation of List ADT
4. Array Implementation of Stack ADT
5. Linked List Implementation of Stack ADT

6. The following three exercises are to be done by implementing the following source files
 - (a) Program for ‘Balanced Paranthesis’
 - (b) Array Implementation of Stack ADT
 - (c) Linked List Implementation of Stack ADT
 - (d) Program for ‘Evaluating Postfix Expressions’

An appropriate header file for the Stack ADT should be included in (a) and (d)

I. Implement the application for checking ‘Balanced Paranthesis’ using Array Implementation of Stack ADT (by implementing files (a) and (b) given above)

II. Implement the application for checking ‘Balanced Paranthesis’ using Linked List Implementation of Stack ADT (by using file (a) from experiment 1 and implementing file (c))

III. Implement the application for ‘Evaluating Postfix Expressions’ using array and Linked List implementations of Stack ADT (by Implementing file (d) and using file (b) - and then by using files (d) and (c))

7. Queue ADT
8. Search Tree ADT – Binary Search Tree
9. Heap Sort
10. Quick Sort

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ELECTRONIC DEVICES AND CIRCUITS LABORATORY

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1. Measurement of characteristics of PN Junction Diode.
2. Measurement of characteristics of Zener Diode
3. Measurement of characteristics of Special Diodes such as
 - a. Varactor Diode
 - b. Tunnel Diode
 - c. Photo Diode
 - d. Schottky Diode
4. Clipper and Clamper Circuits using Diode.
5. Design and testing of Rectifiers with and without Filters.
6. Input and Output characteristics of BJT and determination of h- parameters from the graph.
7. Output characteristics of JFET.
 - a. Plot of Transfer characteristics from the output characteristics.
 - b. Determination of pinch off voltage and I_{ds}
8. Fixed Bias amplifier circuits using BJT.
9. BJT Amplifier using voltage divider bias (self bias) with unbypassed emitter resistor.
10. Source follower with Bootstrapped gate resistance.
11. Measurement of UJT and SCR Characteristics.
 - a. Firing Characteristics of SCR.
 - b. Measurement of Intrinsic stands off ratio of UJT.
 - c. Measurement of DIAC and TRIAC Characteristics.
12. Measurement of Characteristics of Power Amplifiers (Class A, B and C)

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OBJECT ORIENTED PROGRAMMING LABORATORY

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1. Programs Using Functions
 - Functions with Default Arguments
 - Implementation of Call by Value- Call by Address
2. Simple Classes for understanding objects- member functions and Constructors
 - Classes with Primitive Data Members
 - Classes with Arrays as Data Members
 - Classes with Pointers as Data Members - String Class
 - Classes with Constant Data Members
 - Classes with Static Member Functions
3. Compile Time Polymorphism
 - Operator Overloading including Unary and Binary Operators
 - Function Overloading
4. Runtime Polymorphism
 - Inheritance
 - Virtual Functions
 - Virtual Base Classes
 - Templates
5. File Handling
 - Sequential Access
 - Random Access

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DESIGN AND ANALYSIS OF ALGORITHMS

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UNIT I BASIC CONCEPTS OF ALGORITHMS 8

Basic Concepts – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamentals of Analysis Framework – Asymptotic Notations and Basic Efficiency Classes.

UNIT II MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS 8

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization.

UNIT III ANALYSIS OF SORTING AND SEARCHING ALGORITHMS 10

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute – Force String Matching – Divide And Conquer – Merge Sort – Quick Sort – Binary Search – Binary Tree – Traversal and Related Properties – Insertion Sort – Depth First Search and Breadth First Search.

UNIT IV ALGORITHMIC TECHNIQUES 10

Transform and Conquer – Presorting – Balanced Search Trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall’s and Floyd’s Algorithm – Optimal Binary Search Trees – Greedy Techniques – Prim’s Algorithm – Kruskal’s Algorithm – Dijkstra’s Algorithm – Huffman Trees.

UNIT V ALGORITHM DESIGN METHODS 9

Backtracking – 8-Queen’s Problem – Hamiltonian Circuit Problem – Subset – Sum Problem – Branch and Bound – Assignment Problem – Knapsack Problem – Traveling Salesman Problem.

Total: 45

TEXT BOOK

1. Anany Levitin, “Introduction to the Design and Analysis of Algorithm”, Pearson Education, 2003.

REFERENCES

1. T.H. Cormen C.E. Leiserson, R.L. Rivest and C. Stein, “Introduction to Algorithms”, Second Edition, PHI, 2007.
2. Sara Baase and Allen Van Gelder, “Computer Algorithms – Introduction to Design and Analysis”, Pearson Education, 2003.
3. A.V.Aho J.E., Hopcroft and J.D.Ullman, “The Design and Analysis of Computer Algorithms”, Pearson Education, 2003.

SYSTEM SOFTWARE

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UNIT I FUNDAMENTALS

8

System Software and Machine Architecture – The Simplified Instructional Computer (SIC) – Machine Architecture – Data and Instruction Formats – Addressing Modes – Instruction Sets – I/O and Programming.

UNIT II ASSEMBLERS

10

Basic Assembler Functions – A Simple SIC Assembler – Assembler Algorithm and Data Structures – Machine Dependent Assembler Features – Instruction Formats and Addressing Modes – Program Relocation – Machine Independent Assembler Features – Literals – Symbol – Defining Statements – Expressions – One Pass Assemblers and Multi Pass Assemblers – Implementation Example – MASM Assembler.

UNIT III LOADERS AND LINKERS

9

Basic Loader Functions – Design of Absolute Loader – Simple Bootstrap Loader – Machine Dependent Loader Features – Relocation – Program Linking – Algorithm and Data Structures for Linking Loader – Machine Independent Loader Features – Automatic Library Search – Loader Options – Loader Design Options – Linkage Editors – Dynamic Linking – Bootstrap Loaders – Implementation Example – MSDOS Linker.

UNIT IV MACRO PROCESSORS

9

Basic Macro Processor Functions – Macro Definition and Expansion – Macro Processor Algorithm and Data Structures – Machine Independent Macro Processor Features – Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters – Macro within Macro – Implementation Example – MASM Macro Processor – ANSI C Macro Language.

UNIT V SYSTEM SOFTWARE TOOLS

9

Text Editors – Overview of the Editing Process – User Interface – Editor Structure – Interactive Debugging Systems – Debugging Functions and Capabilities – Relationship with other Parts of the System – User Interface Criteria.

Total: 45

TEXT BOOK

1. Leland L. Beck, “System Software - An Introduction to Systems Programming”, Third Edition, Pearson Education, 2000.

REFERENCES

1. D. M. Dhamdhare, “Systems Programming and Operating Systems”, Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan, “Systems Programming”, Tata McGraw-Hill, 1972.

OPERATING SYSTEMS

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UNIT I FUNDAMENTALS 9

Concepts – Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems – Hardware Protection – System Components – Operating System Services – System Calls – System Programs.

UNIT II PROCESS MANAGEMENT 9

Process Concept – Process Scheduling – Operations On Processes – Cooperating Processes – Inter Process Communication – Threads – Overview – Threading Issues – Cpu Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple Processor Scheduling – Real Time Scheduling – The Critical Section Problem – Synchronization Hardware – Semaphores – Classic Problems Of Synchronization – Critical Regions – Monitors.

UNIT III DEADLOCKS 9

System Model – Deadlock Characterization – Methods for Handling Deadlocks –Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlocks.

UNIT IV MEMORY AND FILE MANAGEMENT 9

Storage Management – Swapping – Contiguous Memory Allocation – Paging – Segmentation – Segmentation with Paging – Virtual Memory – Demand Paging – Process Creation – Page Replacement – Allocation of Frames – Thrashing – File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V FILE AND I/O SYSTEMS 9

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free – Space Management. Kernel I/O Subsystems – Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System – Windows

L: 45 T: 15 Total: 60

TEXT BOOK

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, “Operating System Concepts”, John Wiley & Sons, Sixth Edition, 2003.

REFERENCES

1. Harvey M. Deitel, “Operating Systems”, Second Edition, Pearson Education, 2002.
2. Andrew S. Tanenbaum, “Modern Operating Systems”, Prentice Hall of India, 2003.
3. William Stallings, “Operating System”, Fourth Edition, Prentice Hall of India, 2003.

DATABASE MANAGEMENT SYSTEMS

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UNIT I FUNDAMENTALS AND CONCEPTUAL MODELING 9

File and Database Systems – Database System Structure – Data Models – Introduction to Network and Hierarchical Models – ER Model – Relational Model – Relational Algebra and Calculus.

UNIT II RELATIONAL MODEL 9

SQL – Data Definition – Queries in SQL – Updates – Views – Integrity and Security – Relational Database Design – Functional Dependencies and Normalization for Relational Databases (Upto BCNF).

UNIT III DATA STORAGE AND QUERY PROCESSING 9

Record Storage and Primary File Organization – Secondary Storage Devices – Operations on Files – Heap File – Sorted Files – Hashing Techniques – Index Structure for Files – Different Types of Indexes – B-Tree – B⁺ Tree– Query Processing.

UNIT IV TRANSACTION MANAGEMENT 9

Transaction Processing – Introduction – Need For Concurrency Control – Desirable Properties Of Transaction – Schedule And Recoverability – Serializability And Schedules – Concurrency Control – Types Of Locks – Two Phases Locking – Deadlock – Time Stamp Based Concurrency Control – Recovery Techniques – Concepts – Immediate Update – Deferred Update – Shadow Paging.

UNIT V CURRENT TRENDS 9

Object Oriented Databases – Need For Complex Data Types – OO Data Model – Nested Relations – Complex Types – Inheritance Reference Types – Distributed Databases – Homogenous and Heterogenous – Distributed Data Storage – XML – Structure of XML – Data – XML Document – Schema – Querying and Transformation – Data Mining and Data Warehousing.

L: 45 T: 15 Total: 60

TEXT BOOK

1. Abraham Silberschatz, Henry F.Korth and S.Sudarshan “Database System Concepts”, Fourth Edition, McGraw-Hill, 2002.

REFERENCES

1. Ramez Elmasri and Shamkant B. Navathe, “Fundamental Database Systems”, Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, “Database Management System”, Tata McGraw-Hill, 2003.
3. Hector Garcia-Molina, Jeffrey D.Ullman and Jennifer Widom, “Database System Implementation”, Pearson Education, 2000.
4. Peter Rob and Corlos Coronel, “Database System, Design, Implementation and Management”, Fifth Edition, Thompson Learning Course Technology, 2003.

SYSTEM SOFTWARE LABORATORY

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1. Design of an Editor: Design of a Line or Screen Editor using C Language.
2. Design of an Assembler.
3. Simulation of Loaders.
4. Interprocess Communication.
5. Token Separation and Symbol Table Manipulation.
6. Construction of Parsing Table.

Total: 45

OPERATING SYSTEMS LABORATORY

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(Implement the following on LINUX platform. Use C for high level language implementation)

1. Shell Programming
 - Command Syntax
 - Write Simple Functions
 - Basic Tests
2. Shell Programming
 - Loops
 - Patterns
 - Expansions
 - Substitutions
3. Write Programs using the following System Calls of UNIX operating system:
fork - exec - getpid - exit - wait - close - stat - opendir – readdir
4. Write programs using the I/O system calls of UNIX Operating System (open - read - write - etc)
5. Write C programs to simulate UNIX Commands like ls - grep - etc.
6. Given the list of processes - their CPU Burst Times and Arrival times - display/print the Gantt chart for FCFS and SJF. For each of the Scheduling Policies - compute and print the Average Waiting Time and Average Turn Around Time
7. Given the list of Processes - their CPU Burst Times and Arrival Times - display/print the Gantt chart for Priority and Round robin. For each of the Scheduling Policies - compute and print the average waiting time and average turnaround time
8. Implement the Producer - Consumer problem using Semaphores.
9. Implement some Memory Management Schemes - I
10. Implement some Memory Management Schemes - II

Example for experiment 9 and 10:

Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process id, starting byte address and the ending byte address of the allocated space.

When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

Total: 45

DATABASE MANAGEMENT SYSTEMS LABORATORY

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LIST OF EXPERIMENTS

1. Data Definition Language (DDL) Commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) Commands in RDBMS.
3. High-Level Language extension with Cursors.
4. High Level Language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database Design using E-R model and Normalization.
8. Design and Implementation of Payroll Processing System.
9. Design and Implementation of Banking System.
10. Design and Implementation of Library Information System.

Total: 45