DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY LUCKNOW

Evaluation Scheme and Syllabus

For

Second Year M.C.A.

(Master of Computer Application)

On

Choice Based Credit System

(Effective from the Session: 2017-18)

Master of Computer Application

Third Semester

S. No.	Subject Code	Subject Name	L	T	P	CT	TA	Total	ESE	Total	Credit
			Periods			**Evaluation Scheme**					**Credit**
						Sessional			**ESE**	**Total**	
			L	T	P	CT	TA	Total			
1.	RCA301	Operating Systems	3	1	0	20	10	30	70	100	04
2.	RCA302	Web Technology	3	1	0	20	10	30	70	100	04
3.	RCA303	Design & Analysis of Algorithms	3	1	0	20	10	30	70	100	04
4.	RCA304	Computer Based Optimization Techniques	3	1	0	20	10	30	70	100	04
5.	RCA305	Cyber Security	3	0	0	20	10	30	70	100	03
6.*	RCAA01*	Introduction to Programming and Computer Organization*	3	0	0	20	10	30	70	100	--
Practical											
7.	RCA351	Operating Systems Lab	0	0	3	30	20	50	50	100	02
8.	RCA352	Design & Analysis of Algorithms Lab	0	0	6	30	20	50	50	100	03
		Total								700	24

Fourth Semester

S. No.	Subject Code	Subject Name	L	T	P	CT	TA	Total	ESE	Total	Credit
			Periods			**Evaluation Scheme**					**Credit**
			L	T	P	**Sessional**			**ESE**	**Total**	
						CT	TA	Total			
1.	RCA401	Database Management Systems	3	1	0	20	10	30	70	100	04
2.	RCA402	Computer Networks	3	1	0	20	10	30	70	100	04
3.	RCA403	Artificial Intelligence	3	1	0	20	10	30	70	100	04
4.	RCA404	Compiler Design	3	1	0	20	10	30	70	100	04
5.	RCAE12 to E15	Elective –I	3	1	0	20	10	30	70	100	03
6.*	RCAA02*	Fundamental of Data Structure, Numerical and Computational Theory*	3	0	0	20	10	30	70	100	--
Practical											
7.	RCA451	Mini Project	0	0	6	30	20	50	50	100	03
8.	RCA452	Database Management Systems Lab	0	0	3	30	20	50	50	100	02
		Total	15	5	6					700	24

***Note:** MCA Lateral Entry candidates are required to qualify following two audit courses also. These courses will be of qualifying nature and shall not be considered towards semester total of marks.*

* Audit Courses to be completed by MCA Lateral Entry Students only.

 1. *Audit Course 1: RCA-A01*
 2. *Audit Course 2: RCA-A02*

<u>List of Electives</u>

Elective – I
 1. RCA-E11: Design & Development of Applications
 2. RCA-E12: Client-Server Computing
 3. RCA-E13: Data Warehousing & Data Mining
 4. RCA-E14: Advanced Computer Architecture
 5. RCA-E15: Mobile Computing

RCA-301 Operating Systems

UNIT I–INTRODUCTION: - Computer System Overview-Basic Elements, Instruction Execution, Interrupts, Memory Hierarchy, Cache Memory, Direct Memory Access, Multiprocessor and Multicore Organization. Operating system overview-objectives and functions, Evolution of Operating System.

UNIT II–PROCESSES: - Process States, Process Description and Process Control. Processes and Threads, Types of Threads, Multicore and Multithreading, Windows 7- Thread and SMP Management.

UNIT III-CONCURRENCY AND SCHEDULING:-Principles of Concurrency-Mutual Exclusion, Semaphores, Monitors, Readers/Writers problem. Deadlocks-prevention-avoidance-detection, Scheduling- Types of Scheduling-Scheduling algorithms.

UNIT IV–MEMORY:- Memory management requirements, Partitioning, Paging and Segmentation, Virtual memory - Hardware and control structures, operating system software, Linux memory management, Windows memory management.

UNIT V - INPUT/OUTPUT AND FILE SYSTEMS: - I/O management and disk scheduling – I/O devices, organization of I/O functions; OS design issues, I/O buffering, disk scheduling, Disk cache. File management – Organization, Directories, File sharing, and Record blocking, secondary storage management.

References:-
1. Silberschatz, Galvin and Gagne, "Operating Systems Concepts", Wiley
2. Andrew S. Tanenbaum, "Modern Operating System", PHI Learning
3. Tanenbaum /Woodhaull "Operating System Design and Implementation", Pearson Publication.
4. Harvey M Dietel, " An Introduction to Operating System", Pearson Education
5. Flynn, "Understanding Operating System" , Cengage.
6. D M Dhamdhere, "Operating Systems : A Concept basedApproach", McGraw Hill.
7. Charles Crowley, "Operating Systems: A Design-Oriented Approach", Tata McGraw Hill Education".
8. Stuart E. Madnick& John J. *Donovan.Operating Systems.*McGraw Hill.
9. A. K. Sharma, "Operating System", University Press.
10. Achyut S Godbole, Atul kahate , "Operating System", McGraw Hill

RCA-302 Web Technology

UNIT I- INTRODUCTION & WEB DESIGN:- Introduction: Concept of WWW, Internet and WWW, HTTP Protocol: Request and Response, Web browser and Web servers, Features of Web 2.0

Web Design: Concepts of effective web design, Web design issues including Browser, Bandwidth and Cache, Display resolution, Look and Feel of the Website, Page Layout and linking, User centric design, Sitemap, Planning and publishing website, Designing effective navigation.

UNIT II- HTML & STYLE SHEETS:- HTML: Basics of HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, forms, XHTML, Meta tags, Character entities, frames and frame sets, Browser architecture and Web site structure. Overview and features of HTML 5

Style sheets : Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2, Overview and features of CSS3

UNIT III- JAVESCRIPT & XML:- JavaScript : Client side scripting with JavaScript, variables, functions, conditions, loops and repetition, Pop up boxes, Advance JavaScript: JavaScript and objects, JavaScript own objects, the DOM and web browser environments, Manipulation using DOM, forms and validations, DHTML : Combining HTML, CSS and JavaScript, Events and buttons

XML: Introduction to XML, uses of XML, simple XML, XML key components, DTD and Schemas, Using XML with application. Transforming XML using XSL and XSLT

UNIT IV- PHP:- PHP : Introduction and basic syntax of PHP, decision and looping with examples, PHP and HTML, Arrays, Functions, Browser control and detection, string, Form processing, Files, Advance Features: Cookies and Sessions, Object Oriented Programming with PHP

UNIT V- MYSQL:- PHP and MySQL : Basic commands with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names, creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP myadmin and database bugs

References:-
1. Developing Web Applications, Ralph Moseley and M. T. Savaliya, Wiley-India
2. Web Technologies, Black Book, Dreamtech Press
3. HTML 5, Black Book, Dreamtech Press
4. Web Design, Joel Sklar, Cengage Learning
5. Developing Web Applications in PHP and AJAX, Harwani, McGraw Hill
6. Internet and World Wide Web How to program, P.J. Deitel & H.M. Deitel, Pearson

RCA- 303 Design and Analysis of Algorithms

UNIT-I INTRODUCTION: Algorithms, Analyzing algorithms, Complexity of algorithms, Growth of functions, Performance measurements, Sorting and order Statistics - Shell sort, Quick sort, Merge sort, Heap sort, Comparison of sorting algorithms, Sorting in linear time.

UNIT-II ADVANCED DATA STRUCTURES: - Red-Black trees, B-trees, Binomial Heaps, Fibonacci Heaps.

UNIT-III DIVIDE AND CONQUER, GREEDY METHOD: Sorting, Matrix Multiplication, Convex hull and Searching. Greedy methods with examples such as Optimal Reliability Allocation, Knapsack, and Minimum Spanning trees-Prim's and Kruskal's algorithms, Single source shortest paths – Dijkstra's and Bellman Ford algorithms.

UNIT–IV DYNAMIC PROGRAMMING, BACKTRACKING AND BRANCH AND BOUND: - Dynamic programming with examples such as Knapsack, All pair shortest paths – Warshall's and Floyd's algorithms, Resource allocation problem. Backtracking, Branch and Bound with examples such as Travelling Salesman Problem, Graph Colouring, n-Queen Problem, Hamiltonian Cycles and Sum of subsets.

Unit -V Selected Topics: Algebraic Computation, Fast Fourier Transform, String Matching, Theory of NP-completeness, Approximation algorithms and Randomized algorithms.

References:-

1. Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, "Introduction to Algorithms", Printice Hall of India.
2. RCT Lee, SS Tseng, RC Chang and YT Tsai, "Introduction to the Design and Analysis of Algorithms", McGraw Hill, 2005.
3. E. Horowitz & S Sahni, "Fundamentals of Computer Algorithms",
4. Berman, Paul," Algorithms", Cengage Learning.
5. Aho, Hopcraft, Ullman, "The Design and Analysis of Computer Algorithms" ,Pearson Education, 2008.
6. Jon Kleinberg, Eva Tardos, "Algorithm Design" ,Pearson Education.

RCA 304 COMPUTER BASED OPTIMIZATION TECHNIQUES

UNIT I-PRELIMINARIES:- Inventory Models and Replacement problems: Inventory models – various costs-deterministic inventory models, Single period inventory model with shortest cost, stochastic models, Application of inventory models, Economic lot sizes-price breaks, and Replacement problems-capital equipment-discounting costs-replacement in anticipation of failure-group replacement-stochastic nature underlying the failure phenomenon.

UNIT II-LINEAR PROGRAMMING PROBLEMS (LPP):- Definition of LPP, Graphical Solutions of Linear Programming Problems, Simplex Method, and Artificial Variable Method, Two Phase Method, Charnes' Big-M Method, Sensitivity Analysis, Revised Simplex Method, Duality, Dual Simplex Method

UNIT III-INTEGER LINEAR PROGRAMMING PROBLEMS: - Integer Linear Programming Problems, Mixed Integer Linear Programming Problems, Cutting Plane Method, Branch and Bound Method, 0-1 integer linear programming problem. Transportation Problems: Introduction to Transportation Model, Matrix Form of TP, Applications of TP Models, Basic Feasible Solution of a TP, Degeneracy in TP, Formation of Loops in TP, Solution Techniques of TP, Different Methods for Obtaining Initial Basic Feasible Solutions viz. Matrix Minima Method, Row Minima Method, Column Minima Methods, Vogel's Approximation Method, Techniques for Obtaining Optimal Basic Feasible Solution. Assignment Problems: Definition, Hungarian Method for AP.

UNIT IV-INTRODUCTION TO NLP:- Definition of NLP, Convex Programming Problems, Quadratic Programming Problems, Wolfe's Method for Quadratic Programming, Kuhn-Tucker Conditions, Geometrical Interpretation of KT-Conditions, KT-Points etc. Dynamic Programming: Bellman's Principle of optimality of Dynamic Programming, Multistage decision problem and its solution by Dynamic Programming with finite number of stages, Solution of linear programming problems as a Dynamic Programming problem

UNIT V-QUEUING THEORY:-Introduction to Queues, Basic Elements of Queuing Models, Queue Disciplines, Memoryless Distribution, Role of Exponential and Poisson Distributions, Markovian Process, Erlang Distribution, Symbols and Notations, Distribution Of Arrivals, Distribution of Service Times, Definition of Steady and Transient State, Poisson Queues.

References:-
1. Hadley, G., "Linear Programming, and Massachusetts", Addison-Wesley
2. Taha, H.A, "Operations Research – An Introduction", Macmillian
3. Hiller, F.S., G.J. Lieberman, " Introduction to Operations Research", Holden-Day
4. Harvey M. Wagner, "Principles of Operations R search with e Applications to Managerial Decisions", Prentice Hall of India Pvt. Ltd.
5. Swarup K etal, "Operation Research", S. Chand

RCA-305 Cyber Security

UNIT I

Introduction to information systems, Types of information Systems, Development of Information Systems, Introduction to information security, Need for Information security, Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis.

UNIT II

Application security (Database, E-mail and Internet), Data Security Considerations-Backups, Archival Storage and Disposal of Data, Security Technology-Firewall and VPNs, Intrusion Detection, Access Control.

Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail viruses, Macro viruses, Malicious Software, Network and Denial of Services Attack, Security Threats to E-Commerce- Electronic Payment System, e-Cash, Credit/Debit Cards. Digital Signature, public Key Cryptography.

UNIT III

Developing Secure Information Systems, Application Development Security, Information Security Governance & Risk Management, Security Architecture & Design Security Issues in Hardware, Data Storage & Downloadable Devices, Physical Security of IT Assets, Access Control, CCTV and intrusion Detection Systems, Backup Security Measures.

UNIT IV

Security Policies, Why Policies should be developed, WWW policies, Email Security policies, Policy Review Process-Corporate policies-Sample Security Policies, Publishing and Notification Requirement of the Policies.

Information Security Standards-ISO, IT Act, Copyright Act, Patent Law, IPR. Cyber Laws in India; IT Act 2000 Provisions, Intellectual Property Law: Copy Right Law, Software License, Semiconductor Law and Patent Law.

UNIT V

References:-

1. Charles P. Pfleeger, Shari Lawerance Pfleeger, "Analysing Computer Security", Pearson Education India.
2. V.K. Pachghare, "Cryptography and information Security", PHI Learning Private Limited, Delhi India.
3. Dr. Surya Prakash Tripathi, Ritendra Goyal, Praveen kumar Shukla ,"Introduction to Information Security and Cyber Law" Willey Dreamtech Press.
4. Schou, Shoemaker, "Information Assurance for the Enterprise", Tata McGraw Hill.
5. CHANDER, HARISH, "Cyber Laws And It Protection", PHI Learning Private Limited, Delhi, India

Audit Course-1
RCA-A01 Introduction to Programming and Computer Organization

UNIT-I

Natural Numbers: - Well Ordering Principle, Principle of Mathematical Induction.
Set Theory: - Ordered Sets, Relations, Equivalence Relations and Partitions, Modular Arithmetic.
Functions: - Functions, Composition of Functions, one-one, onto and Inverse of a function

UNIT-II

Data representation: - signed and unsigned number representation, fixed and floating point representations.
Basic Electronics: - Digital Logic Boolean algebra. Combinational and sequential circuits, Gate Minimization.
Computers Fundamentals:- Functional Units-Processor, Memory, Input/ output, Register Organized Computer, Buses- Organization, Hierarchical Bus, Types, Control, Timing, Width, Clock.

UNIT-III

CPU Organization: Fundamentals, Instruction Set formats, modes, types, Fixed and Floating point arithmetic.
Architecture Concepts: - Instruction set architecture of a CPU-register, instruction execution cycle.
Pipelining: Basic concepts of pipelining, throughput and speedup, pipeline hazards.

UNIT-IV

Introduction to programming: - Problem solving and expression of solution through flow chart and algorithm.
Parts of a program: - primitive data types, variables, operators and their precedence, expressions, input/output, conditionals and branching, looping statements.
Stored Programs: Procedures, Functions, Storage classes-scope and life time, recursion.

References:-
1. Discrete Mathematics and Its Applications: Kenneth H. Rosen
2. Digital Logic and Computer Design: M. Morris Mano
3. Fundamentals of Programming Languages: Dipali P. Bavishankar, Technical Publications

RCA-351 Operating Systems Lab

1. To implement CPU Scheduling Algorithms

   - FCFS
   - SJF
   - SRTF
   - PRIORITY
   - ROUND ROBIN

2. Simulate all Page Replacement Algorithms

   - FIFO
   - LRU

3. Simulate Paging Technique of Memory Management

RCA-352 Design & Analysis of Algorithms Lab
(Using Java and Dot Net Framework)

Objective:-
1. Program for Recursive Binary & Linear Search.
2. Program for Heap Sort.
3. Program for Merge Sort.
4. Program for Selection Sort.
5. Program for Insertion Sort.
6. Program for Quick Sort.
7. Study of NP-Complete theory.
8. Study of Cook's theorem.
9. Study of sorting network.

RCA- 401 Database Management Systems

UNIT I–INTRODUCTION:-The Evolution of Database Systems- Overview of a Database Management System-Outline of Database-System Studies-The Entity- RELATIONSHIP DATA MODEL: Elements of the E/R Model-Design Principles-The Modelling of Constraints-Weak Entity Sets

UNIT II - THE RELATIONAL DATA MODEL & ALGEBRA: - Basics of the Relational Model-From E/R Diagrams to Relational Designs Converting Subclass Structures to Relations Functional Dependencies-Rules About Functional Dependencies-Design of Relational Database Schemas - Multivalued Dependencies. RELATIONAL ALGEBRA: Relational Operations-Extended Operators of Relational Algebra- Constraints on Relations

UNIT III-SQL:-Simple Queries in SQL-Sub queries-Full-Relation Operations-Database Modifications-Defining a Relation Schema-View Definitions- Constraints and Triggers: Keys and Foreign Keys-Constraints on Attributes and Tuples Modification of Constraints-Schema-Level Constraints and Triggers -Java Database Connectivity- Security and User Authorization in SQL

UNIT IV - INDEX STRUCTURE, QUERY PROCESSING:-Index Structures: Indexes on Sequential Files-Secondary Indexes-B-Trees-Hash Tables-Bitmap Indexes. QUERY EXECUTION: Physical-Query-Plan Operators-One-Pass, two-pass & index based Algorithms, Buffer Management, Parallel Algorithms-Estimating the Cost of Operations-Cost-Based Plan Selection -Order for Joins-Physical- QueryPlan

UNIT V - FAILURE RECOVERY AND CONCURRENCY CONTROL:-Issues and Models for Resilient Operation -Undo/Redo Logging-Protecting against Media Failures

CONCURRENCY CONTROL: Serial and Serializable Schedules-Conflict Serializability-Enforcing Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.

TRANSACTION MANAGEMENT: Serializability and Recoverability-View Serializability-Resolving Deadlocks-Distributed Databases: Commit and Lock

References:-
1. Hector Garcia-Molina, Jeff Ullman, and Jennifer Widom, "Database Systems: The Complete Book", Pearson Education, Second Edition, 2008.
2. Silberschatz, H. Korth and Sudarshan S., "Database System Concepts", 6th Edition, McGraw-Hill International, 2010.
3. Elmasri R. and Shamakant B.Navathe, "Fundamentals of Database Systems", 6th Edition, AddisionWesley , 2011.

RCA- 402 COMPUTER NETWORK

UNIT I-DATA COMMUNICATIONS :-
Data communication Components – Data representation and Data flow – Networks – Types of Connections – Topologies – Protocols and Standards – OSI model – Transmission Media – LAN –Wired LANs, Wireless LANs, Connecting LANs, Virtual LANs.

UNIT II – DATA LINK LAYER:-
Error Detection and Error Correction – Introduction–Block coding–Hamming Distance – CRC–Flow Control and Error control – Stop and Wait – Go back – N ARQ – Selective Repeat ARQ – Sliding Window – Piggybacking – Random Access – CSMA/CD,CDMA/CA.

UNIT III – NETWORK LAYER:-
Switching–Logical addressing – IPV4 – IPV6–Address mapping–ARP, RARP, BOOTP and DHCP–Delivery, Forwarding and Unicast Routing protocols.

UNIT IV – TRANSPORT LAYER:-
Process to Process Delivery – User Datagram Protocol – Transmission Control Protocol – SCTP – Congestion Control with Examples.

UNIT V – APPLICATION LAYER:-
Domain Name Space – DDNS – TELNET – EMAIL – File transfer WWW – HTTP – SNMP – Cryptography – Basic concepts.

References:-

1. Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw– Hill, Fourth Edition, 2011.
2. Larry L.Peterson, Peter S. Davie, "Computer Networks", Elsevier, Fifth Edition, 2012.
3. William Stallings, "Data and Computer Communication", Eighth Edition, Pearson Education, 2007.
4. James F. Kurose, Keith W. Ross, "Computer Networking: A Top–Down Approach Featuring the Internet", Pearson Education, 2005.

RAC- 403 Artificial Intelligence

Unit-I INTRODUCTION:- Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.

UNIT-II INTRODUCTION TO SEARCH:- Searching for solutions, Uniformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning.

UNIT-III KNOWLEDGE REPRESENTATION & REASONING:- Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.

UNIT-IV MACHINE LEARNING:- Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data - Naive Bayes models, Learning with hidden data - EM algorithm, Reinforcement learning,

UNIT-V PATTERN RECOGNITION:- Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods - Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA), Classification Techniques – Nearest Neighbour (NN) Rule, Bayes Classifier, Support Vector Machine (SVM), K – means clustering.

References:-

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Pearson Education
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", McGraw-Hill
3. E Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education
4. Dan W. Patterson, "Artificial Intelligence and Expert Systems", Prentice Hall of India

RCA-404 Compiler Design

UNIT I - COMPILERS: GRAMMARS & AUTOMATA:- Languages – Grammars – Types of grammars – Context free grammar - regular expression - Recognizing of patterns - finite automation (deterministic & non deterministic) Conversion of NDFA to DFA - Conversion of regular expression of NDFA – Thompson's construction- minimization of NDFA –Derivation - parse tree – ambiguity

UNIT II- LEXICAL ANALYSIS:- Lexical analysis- handles - token specification - design of lexical analysis (LEX) - Automatic generation of lexical analyzer - input buffering - A language for specifying lexical analyzers - implementation of lexical analyzer

UNIT III - SYNTAX ANALYSIS – PARSING:- Definition - role of parsers - top down parsing - bottom-up parsing - Left recursion - left factoring - Handle pruning , Shift reduce parsing - operator precedence parsing – FIRST- FOLLOW- LEADING- TRAILING- Predictive parsing - recursive descent parsing. LR parsing – LR (0) items - SLR parsing – Canonical LR - LALR parsing - generation of LALR - Ambiguous grammars - error recovery

UNIT IV - SYNTAX DIRECTED TRANSLATION:- Intermediate Languages - prefix - postfix - Quadruple - triple - indirect triples – syntax tree- Evaluation of expression - three-address code- Synthesized attributes – Inherited attributes – Conversion of Assignment statements- Boolean expressions –Backpatching - Declaration - CASE statements.

UNIT V -CODE OPTIMIZATION:- Local optimization- Loop Optimization techniques – DAG – Dominators- Flow graphs – Storage allocations- Peephole optimization – Issues in Code Generation.

References:-

1. Alfred V Aho , Jeffery D Ullman , Ravi Sethi, " Compilers , Principles techniques and tools ", Pearson Education 2011
2. Raghavan V., "Principles of Compiler Design", Tata McGraw Hill Education Pvt. Ltd., 2010.
3. David Galles, "Modern Compiler Design", Pearson Education, Reprint 2012.
4. Dasaradh Ramaiah. K., "Introduction to Automata and Compiler Design", PHI, 2011

RCA-E11: Design & Development of Applications

Unit I - INTRODUCTION:

Introduction to Android, Activities and Intents, Testing and Debugging, and Backwards Compatibility.

Unit 2- User Interface:

User Interaction and intuitive navigation, Delightful User Experience, Testing your UI

Unit 3- Background Tasks:

Connect to the Internet, Notifications and Background Tasks, Triggering, Scheduling and Optimizing Background Tasks

Unit 4- Data Saving, Retrieving, Loading:

Storing Data in your app, Storing Data using SQLite, Sharing Data: Content Resolvers and Content Providers, Loading Data using Loaders

Unit 5- Polish and Publish:

Permissions and Libraries, Security best practices, Widgets, Publishing your App, Multiple Form Factors, Google Services, Firebase, Google Cloud Messaging ,Making your app data searchable

References:-

1. Trish Cornez & Richard Cornez "Android Programming Concepts", Jones & Bartlett Learning.

RCA-E12: CLIENT SERVER COMPUTING

UNIT I CLIENT/SERVER COMPUTING:- DBMS concept and architecture, Single system image, Client Server architecture, mainframe-centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing.

UNIT II COMPONENTS OF CLIENT/SERVER APPLICATION:- The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA). The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.

UNIT III CLIENT/SERVER NETWORK:- connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management, Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware.

UNIT IV DATA STORAGE:- magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards. Network protection devices, Power Protection Devices, UPS, Surge protectors. Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues.

UNIT V CLIENT/SERVER SYSTEM DEVELOPMENT:- Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, End-user training. The future of client server Computing Enabling Technologies, The transformational system.

References:

1. Patrick Smith & Steave Guengerich, "Client / Server Computing", PHI
2. Dawna Travis Dewire, "Client/Server Computing", TMH
3. Majumdar & Bhattacharya, "Database management System", TMH
4. Korth, Silberchatz, Sudarshan, "Database Concepts", McGraw Hill
5. Elmasri, Navathe, S.B, "Fundamentals of Data Base System", Addison Wesley

RCA-E13 Data warehousing and Mining

UNIT I DATA WAREHOUSING:- Overview, Definition, Data Warehousing Components, 8 Building a Data Warehouse, Warehouse Database, Mapping the Data Warehouse to a Multiprocessor Architecture, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting.

UNIT II DATA WAREHOUSE PROCESS AND TECHNOLOGY:- Warehousing Strategy, Warehouse 8 /management and Support Processes, Warehouse Planning and Implementation, Hardware and Operating Systems for Data Warehousing, Client/Server Computing Model & Data Warehousing. Parallel Processors & Cluster Systems, Distributed DBMS implementations, Warehousing Software, Warehouse Schema Design, Data Extraction, Cleanup & Transformation Tools, Warehouse Metadata

UNIT III - DATA MINING:- Overview, Definition & Functionalities, Data 8 Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data,(Binning, Clustering, Regression, Computer and Human inspection),Inconsistent Data, Data Integration and Transformation. Data Reduction:-Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Red

UNIT IV - DATA MINING TECHNIQUES:- Classification: Definition, Data Generalization, Analytical Characterization, 8 Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases, Statistical-Based Algorithms, Distance-Based Algorithms, Decision Tree-Based Algorithms. Clustering: Introduction, Similarity and Distance Measures, Hierarchical and Partitional Algorithms. Hierarchical Clustering- CURE and Chameleon. Density Based Methods-DBSCAN, OPTICS. Grid Based Methods- STING, CLIQUE. Model Based Method –Statistical Approach, Association rules: Introduction, Large Itemsets, Basic Algorithms, Parallel and Distributed Algorithms, Neural Network approach.

UNIT V - DATA VISUALIZATION AND OVERALL PERSPECTIVE:- Aggregation, Historical 8 information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse. Warehousing applications and Recent Trends: Types of Warehousing Applications, Web Mining, Spatial Mining and Temporal Mining.

References:-

1. Alex Berson, Stephen J. Smith "Data Warehousing, Data-Mining & OLAP", TMH
2. Mark Humphries, Michael W. Hawkins, Michelle C. Dy, " Data Warehousing: Architecture and Implementation", Pearson
3. Margaret H. Dunham, S. Sridhar, "Data Mining: Introductory and Advanced Topics" Pearson Education
4. Arun K. Pujari, "Data Mining Techniques" Universities Press
5. Pieter Adriaans, Dolf Zantinge, "Data-Mining", Pearson Education

RCA- E14 Advanced Computer Architecture

UNIT - I: INTRODUCTION:- Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Flynn's & Feng's Classification, Performance Metrics and Measures, Speedup Performance Laws: Multiprocessor System and Interconnection Networks; IEEE POSIX Threads: Creating and Exiting Threads, Simultaneous Execution of Threads, Thread Synchronization using Semaphore and Mutex, Cancelling the Threads.

UNIT – II: PIPELINING AND MEMORY HIERARCHY:- Basic and Intermediate Concepts, Instruction Set Principle; ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super Pipeline Design; Memory Hierarchy Design: Advanced Optimization of Cache Performance, Memory Technology and Optimization, Cache Coherence and Synchronization Mechanisms.

UNIT – III: THREAD AND PROCESS LEVEL PARALLEL ARCHITECTURE:- Introduction to MIMD Architecture, Multithreaded Architectures, Distributed Memory MIMD Architectures, Shared Memory MIMD Architecture, Clustering, Instruction Level Data Parallel Architecture, SIMD Architecture, Fine Grained and Coarse Grained SIMD Architecture, Associative and Neural Architecture, Data Parallel Pipelined and Systolic Architectures, Vector Architectures.

UNIT – IV: PARALLEL ALGORITHMS:- PRAM Algorithms: Parallel Reduction, Prefix Sums, Preorder Tree Traversal, Merging two Sorted lists; Matrix Multiplication: Row Column Oriented Algorithms, Block Oriented Algorithms; Parallel Quicksort, Hyper Quicksort; Solving Linear Systems: Gaussian Elimination, Jacobi Algorithm; Parallel Algorithm Design Strategies.

UNIT –V: DEVELOPING PARALLEL COMPUTING APPLICATIONS:- OpenMP Implementation in 'C': Execution Model, Memory Model; Directives: Conditional Compilation, Internal Control Variables, Parallel Construct, Work Sharing Constructs, Combined Parallel Work-Sharing Constructs, Master and Synchronization Constructs; Run-Time Library Routines: Execution Environment Routines, Lock Routines, Timing Routines; Simple Examples in 'C'. Basics of MPI.

References:-

1. Kai Hwang," Advance Computer Architecture", TMH
2. Matthew, "Beginning Linux Programming", SPD/WROX
3. Hennessy and Patterson," Computer Architecture: A Quantitative Approach", Elsevier
4. Dezso and Sima, "Advanced Computer Architecture", Pearson
5. Quinn, "Parallel Computing: Theory & Practice", TMH 6. Quinn, "Parallel Programming in C with MPI and Open MP", TMH

RCA- E15 MOBILE COMPUTING

UNIT – I
Introduction, issues in mobile computing, overview of wireless telephony: cellular concept, GSM: air-interface, channel structure, location management: HLR-VLR, hierarchical, handoffs, channel allocation in cellular systems, CDMA, GPRS.

UNIT - II
Wireless Networking, Wireless LAN Overview: MAC issues, IEEE 802.11, Blue Tooth, Wireless multiple access protocols, TCP over wireless, Wireless applications, data broadcasting, Mobile IP, WAP: Architecture, protocol stack, application environment, applications.

UNIT – III
Data management issues, data replication for mobile computers, adaptive clustering for mobile wireless networks, File system, Disconnected operations.

UNIT - IV
Mobile Agents computing, security and fault tolerance, transaction processing in mobile computing environment.

UNIT – V
Ad Hoc networks, localization, MAC issues, Routing protocols, global state routing (GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, applications.

References:-
1. J. Schiller, Mobile Communications, Addison Wesley.
2. A. Mehrotra , GSM System Engineering.
3. M. V. D. Heijden, M. Taylor, Understanding WAP, Artech House.
4. Charles Perkins, Mobile IP, Addison Wesley.
5. Charles Perkins, Ad hoc Networks, Addison Wesley.

Audit Course-2
RCA-A02 Fundamental of Data Structure, Numerical and Computational Theory

UNIT-I
Arrays:- Array Definition, Representation and Analysis, Single and Multidimensional Arrays, Searching: Sequential search, binary search, comparison and analysis, Sorting: Insertion Sort, Bubble sort, Quick Sort, Two Way Merge Sort, Heap Sort.
Linked list:- Representation and Implementation of Singly Linked Lists, Two –way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists algorithm (Beginning, end and middle).

UNIT-II
Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm.
Curve fitting and Approximation: Method of least squares, fitting of straight lines, polynomials, exponential curves.
Regression analysis: Linear and Non-linear regression, multiple regressions

UNIT-III
Time series Analysis and Hypothesis Testing: forecasting models and methods. Test of significance, Chi-square test, t-test, F-Test
Finite State Machines (FSM): Introduction, Deterministic (DFA), Nondeterministic (NFA). Conversions and Equivalence: Equivalence between NFA with and without ε transitions. NFA to DFA conversion. Minimization of FSM.

UNIT-IV
Regular Expression & Regular Set: Definition, Properties, Pumping Lemma, and Decision problem for regular language.
Grammar: Introduction, Definition, Different types, Derivation Tree, Different Normal Forms, Ambiguous Grammar and its implications, Chomsky hierarchy. Different Classes of Languages.
Pushdown Automata (PDA): Definition, PDA and CFL (Context-Free Language), Acceptance of Strings.
Turing Machine: Introduction, Turing Machine Model.

References:-

1. S. Lipschutz, "Data Structures", Mc-Graw Hill International Editions.
2. K.L.P. Mishra, N. Chandrasekaran, "Theory of Computer Science", PHI.
3. Rajendra Kumar, "Theory of Automata, Languages and Computation", Mc-Graw Hill.
4. M. Goyal, "Computer-Based Numerical & Statistical Techniques", Infinity Science Press.

RCA-452 Database Management Systems Lab

Objectives:-

1. Installing oracle.
2. Creating Entity-Relationship Diagram using case tools.
3. Writing SQL statements Using ORACLE/MYSQL:
   a) Writing basic SQL SELECT statements.
   b) Restricting and sorting data.
   c) Displaying data from multiple tables.
   d) Aggregating data using group function.
   e) Manipulating data.
   f) Creating and managing tables.
4. Normalization in ORACLE.
5. Creating cursor in oracle.
6. Creating procedure and functions in oracle.
7. Creating packages and triggers in oracle.