

**Scheme of Examination PGDCA/ M.Sc. Computer Science (Software)
1st Year/ MCA 1st Year**

Paper Code	Nomenclature	Max. Marks			Pass Marks
		External	Internal	Total	
CS-DE-11	Computer Organization & Networking Fundamentals	80	20	100	35
CS-DE-12	Problem Solving Through 'C'	80	20	100	35
CS-DE-13	Data Structures	80	20	100	35
CS-DE-14	Data Base Management System	80	20	100	35
CS-DE-15	Operating System	80	20	100	35
CS-DE-16	Software Lab – I Programming using C	80	20	100	35
CS-DE-17	Software Lab – II Word, Excel, Access/SQL	80	20	100	35
Total Marks				700	245

CS-DE-11 COMPUTER ORGANIZATION & NETWORKING FUNDAMENTALS

Maximum Marks: 100
External: 80

Minimum Pass Marks: 35
Internal: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus. All questions will carry equal marks.

Students will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, students will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Fundamentals of computers: Block diagram of a digital computer, classification, hardware, software, I/O devices, storage devices – hard disk, pen drive, optical devices.

Information representation - Number Systems, conversion from one number system to another number system, Integer Representation – sign magnitude, 1's complement, 2's complement, BCD codes. Floating-point Representation, Binary arithmetic – addition, subtraction multiplication, division.

UNIT - II

Boolean Functions: Boolean algebra, Truth tables, Logic gates, Canonical representation of Boolean functions, simplification of Boolean expressions – Karnaugh Maps, Quine McCluskey procedure.

Combinational Circuits: Half adder, full adder, half subtractor, full subtractor, parallel binary adder, BCD adder, code converter, decoder, encoder, multiplexer, demultiplexer.

UNIT - III

Sequential Circuits: Flip-flops – synchronous & asynchronous basic flip flops, D-type & T-type flip flops, JK flip flop, master-slave flip flop, characteristics & excitation tables of flip-flops.

Registers – shift registers. Counters – synchronous & asynchronous binary counters, modulo-N counter.

UNIT - IV

Introduction to Computer Networks: Types of Computer Networks and their topologies. Transmission media - wired and wireless. Network hardware components - connectors, transceivers & media converters, repeaters, network interface cards and PC cards, bridges, switches, routers, gateways.

Introduction to the Internet, concepts of Internet and Intranet; IP addresses, DNS; Internet Services; E-mail; File transfer and FTP; Remote login using TELNET; World Wide Web and HTTP; Web Browsers; Search Engines; Uniform Resource Locator(URL); Web Servers; Internet Connections: Dialup; Leased line; Modems; DSL service; Internet Service Provider.

Text Book

1. Digital Logic and Computer Design, M. Morris Mano, PHI, 2000
2. Computer Communications and Networking Technologies, Michael A. Gallo, William M. Hancock, CENGAGE Learning.
3. Foundations of Computing, P.K. Sinha, BPB.

Reference Books

1. An Introduction to Digital Computer Design, V. Rajaraman, T. Radhakrishnan, PHI, 2002
2. Computer Networks, Andrew S. Tanenbaum, Pearson.
3. Computer Networking, James F. Kurose, Keith W. Ross, Pearson. Data Communications and Networking, Behrouz A Forouzan, McGraw Hill.

CS-DE-12 PROBLEM SOLVING THROUGH 'C'

Maximum Marks: 100
External: 80

Minimum Pass Marks: 35
Internal: 20

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus. All questions will carry equal marks.

Students will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, students will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Programming Fundamentals: Introduction to Compiler, Assembler and Interpreter, Concept of problem solving, Problem definition, Program design, Debugging, Types of errors in programming, Documentation. Flowcharting, decision tables, algorithms, Structured programming concepts, Programming methodologies - top-down and bottom-up programming.

UNIT-II

Overview of C: History of C, Importance of C, Structure of a C Program.

Elements of C: C character set, identifiers and keywords, Data types, Constants and Variables.

Operators: Arithmetic, relational, logical, bitwise, unary, assignment and conditional operators and their hierarchy & associativity.

Input/output: Unformatted & formatted I/O function in C.

UNIT-III

Control statements: Sequencing, Selection: if and switch statement; Repetition: for, while, and do-while loop; break, continue, goto.

Functions: Definition, prototype, passing parameters, function calls, library functions, recursion.

Storage classes in C: auto, extern, register and static storage class, their scope, storage, & lifetime.

Arrays: Definition, types, initialization, processing an array, passing arrays to functions, dynamic arrays.

UNIT-IV

Strings: String handling, reading and writing strings, string functions, dynamic strings.

Pointers: Declaration, operations on pointers, pointers and arrays, dynamic memory allocation, pointers and functions, pointers and strings.

Structure & Union: Definition, processing, Structure and pointers, passing structures to functions, Union.

Text Books:

1. Sinha, P.K. & Sinha, Priti, "Computer Fundamentals", BPB
2. Dromey, R.G., "How to Solve it By Computer", PHI
3. Gottfried, Byron S., "Programming with C", Tata McGraw Hill
4. Balagurusamy, E., "Programming in ANSI C", McGraw-Hill
5. Balagurusamy, E., "Computing Fundamentals & C Programming", McGraw-Hill

Reference Books:

1. Jeri R. Hanly & Elliot P. Koffman, "Problem Solving and Program Design in C", Addison Wesley.
2. Yashwant Kanetker, "Let us C", BPB
3. Norton, Peter, "Introduction to Computers", McGraw-Hill
4. Leon, Alexis & Leon, Mathews, "Introduction to Computers", Leon Tech World
5. Rajaraman, V., "Fundamentals of Computers", PHI
6. Rajaraman, V., "Computer Programming in C", PHI

CS-DE-13 DATA STRUCTURES

Maximum Marks: 100
External: 80

Minimum Pass Marks: 35
Internal: 20

Time: 3 hours

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Students will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, students will have to attempt four more questions selecting one question from each Unit.

UNIT –I

Introduction to Data Structures: Elementary data organization, Data structure operations, Algorithm complexity and time-space tradeoff, Classification of data structures.

String Processing: Storing strings, String operations, Pattern matching algorithms.

Arrays: Linear arrays, Operations on arrays, Multidimensional arrays, Storage of arrays, Matrices, Sparse Matrices.

UNIT-II

Linked Lists: Representation of linked list in memory, Traversal, Searching, Insertion, Deletion, Sorted Linked List, Header List, Two – Way List;

Stacks, Queues, Linked and Array representation of Stacks, Queues, and Dequeues, Priority Queues, Operations on stacks and queues.

UNIT –III

Applications of stacks: Recursion, Polish Notation, Quicksort.

Trees: Binary Trees, Representation of binary trees in memory, Threaded Binary Trees, Balanced Tree, Different tree traversal algorithms, Binary Search Tree: Searching, Insertion, and deletion in a Binary search tree, Heap Sort.

UNIT-IV

Representation of Graphs and Applications: Adjacency Matrix, Path Matrix, Warshall's Algorithm, Linked Representation of a Graph, Traversing a Graph;

Sorting and Searching: Radix Sort, Merge Sort, Linear Search, Binary Search, Insertion Sort, Selection Sort, Bubble Sort.

Text Books:

1. Seymour Lipschutz, "Data Structures", Tata Mcgrraw- Hill Publishing Company Limited, Schaum's Outlines, New Delhi.
2. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, "Data Structures Using C", Prentice- Hall of India Pvt. Ltd., New Delhi.

Reference Books:

1. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", McGraw-Hill International Student Edition, New York.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley, (An Imprint of Pearson Education), Mexico City. Prentice- Hall of India Pvt. Ltd., New Delhi.

CS-DE-14 DATA BASE MANAGEMENT SYSTEMS

Maximum Marks: 100
External: 80

Minimum Pass Marks: 35
Internal: 20

Time: 3 hours

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Students will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, students will have to attempt four more questions selecting one question from each Unit.

Unit- I

Data, Information and Knowledge – Limitations of Manual Data Processing – Advantages of databases-Basic DBMS Terminology – Role of DBA, Data Manager, File Manager and Disk Manager- Three Level Architecture of DBMS- Physical and Logical Data Independence, Data Base languages and Interfaces, DBMS functions and component modules.

Unit- II

Entity Relationship Model- Concepts, Relationships, Constraints, Keys- Primary, Secondary, Composite & Foreign Key etc. E-R Diagrams, Mapping ER- diagrams to Relational Tables, Case studies: Inventory System, Payroll System, Reservation System, Online Book Store etc. Introduction to Data Models, Comparison between Hierarchical, Network and Relational models.

Unit- III

Relational Algebra- Query Language, Basic Set Operations, Special Relational Operations, Introduction to SQL: DDL, DML, and DCL Commands, Views& Queries in SQL, Specifying Constraints & Indexes in SQL. Functional Dependencies, Normalization- Normal forms based on primary keys (1 NF, 2 NF, 3 NF, & BCNF)

Unit- IV

MS Access: Parts of an Access Window, Tool Bars and Their Icons, Creating a New Database, Creating a Database through Table Wizard, Creating a New Table, Relationships, Creating Table through Design View, Relationship, Query, Forms, Reports, Import/export tables etc.

Text Books:

1. Elmasri & Navathe, Fundamentals of Database systems, 5th edition, Pearson Education.
2. Taxali, R. K., “PC Software for Windows made simple”, Tata McGraw Hill.
3. Ivan Bayross, “SQL, PL/SQL The Programming Language of Oracle”, BPB Publications.

Reference Books:

1. Korth & Silberschatz, Database System Concept, 4th Edition, McGraw Hill International Edition.
2. Raghu Ramakrishnan & Johannes Gehrke, Database Management Systems, 2nd edition, Mcgraw Hill International Edition.
3. Database Systems, A practical Approach to Design, Implementation and Management, Pearson Education- 3e
4. C.J. Date, An Introduction to Data Bases Systems 7th Edition, Addison Wesley N. Delhi.
5. Bipin C. Desai, An Introduction to Database System, Galgotia Publication, N. Delhi.
6. Windows XP Complete Reference. BPB Publications
7. MS Office XP complete BPB publication

CS-DE-15 OPERATING SYSTEMS

Maximum Marks: 100
External: 80

Minimum Pass Marks: 35
Internal: 20

Time: 3 hours

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Students will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, students will have to attempt four more questions selecting one question from each Unit.

UNIT – I

Introductory Concepts: Operating system functions and characteristics, historical evolution of operating systems, Real time systems, Distributed systems, O/S services, system calls, system programs.

CPU Scheduling: Process concept, Process scheduling, scheduling criteria, Scheduling algorithms.

UNIT-II

Deadlocks: Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery.

Storage Management: Storage allocation methods: Single contiguous allocation, Multiple contiguous allocation, Paging; Segmentation, Virtual memory concepts, Demand Paging, Page replacement Algorithms, Thrashing.

UNIT-III

File Systems: File concept, File access and allocation methods, Directory Systems: Structured Organizations.

Hardware Management: Disk scheduling policies.

Protection: Goals of protection, principles of protection, domain of protection, access matrix & its implementation, revocation of access rights.

UNIT-IV

Windows: Features of Windows; Various versions of Windows & its use; My Computer & Recycle bin; Desktop, Icons and Windows Explorer; Dialog Boxes & Toolbars; Working with Files & Folders; simple operations like copy, delete, moving of files and folders from one drive to another, Accessories and Windows Settings using Control Panel.

Linux: Linux architecture, Features of Linux, Simple Commands in Linux.

Text Books:

1. Silberschatz A., Galvin P.B.,and Gagne G., Operating System Concepts, John Wiley & Sons, Inc.,New York.
2. Ibrahim Mohammad, A Practical Guide to Linux & Shell Programming, Laxmi Publications
3. Taxali, R. K., “PC Software for Windows made simple”, Tata McGraw Hill.

Reference Books:

1. Godbole, A.S. Operating Systems, Tata McGraw-Hill Publishing Company, New Delhi.
2. Ritchie, Colin , Operating Systems incorporating UNIX & Windows, BPB Publications, New Delhi.
3. Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.
4. Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India, New Delhi.
5. Stalings William, Operating System, Prentice Hall of India, New Delhi.
6. Blackburn, Andrew, “MS Windows XP Home Edition Complete”, Laxmi Publications.