

Revised Syllabus

MCA

First Semester

Paper 1

Data Structures with C

One paper : 100 marks / 3 hour duration

Practical + test : 25 marks

1. Introduction to Problem Solving :
Flow charts, Tracing flow charts, Problem solving methods, Need for computer languages, Sample Programs written in C .
- 2.C Language preliminaries :
C character set, Identifiers and keywords, Data types, Declarations, Expressions, statements and symbolic constants.
- 3.Input-Output :
getchar, putchar, scanf, printf, gets, puts, functions.
- 4.Pre-processor commands :
include, #define, #ifdef.
- 5.Preparing and running a complete C program .
- 6.Operators and expressions :
Arithmetic, unary, logical, bit-wise, assignment and conditional operators.
- 7.Control statements:
while, do-while, for statements, nested loops. Ifelse, switch, break, Continue, and goto statements, comma operators.
- 8.Storage types :
Automatic, external and static variables
- 9.Functions :
Defining and accessing, passing arguments, Function prototypes, Recursion, Library functions, Static Functions.

10. Arrays :

Defining and processing, Passing arrays to a function, Multi dimensional arrays.

11. Strings :

Defining and operations on strings.

12. Pointers :

Declarations, Passing pointers to a function, Operations on pointers, Pointer Arithmetic, Pointers and arrays. Arrays of pointers.

13. Structures :

Defining and processing. Passing to a function, Unions.

14. Linear Data structures :

Stacks – LIFO structures, create, pop, push, delete stack

Queues – FIFO structures, priority queues

Lists – linked lists, circular lists, header lists, doubly linked list.

Term work/ Practicals ; Each candidate will submit a journal in which at least 10 practical assignments based on the above syllabus along with the flow chart and program listing will be submitted with the internal test paper. Test graded for 10 marks and Practicals graded for 15 marks.

References :

1. "How to solve it by Computer " : Dromey, PHI,
2. "An Introduction to data structures with applications", Jean-Paul Trembly and Paul Sorenson, (2nd edition), 1984.
3. "Schaum's outline of Theory and Problems of programming with C" : Gottfried.
4. "The C programming Language", Kerninghan and Ritchie.
5. "Programming in ANSI C" : Ramkumar Agarwal.

Paper 2

Computer Concepts

One paper : 100 marks / 3 hour duration

Practical + test : 25 marks

1. Information concepts & Processing :-
Evolution of information processing,
Data as resource,

Language & Communication,
Range of applications like scientific, business etc.

2.Elements of a computer processing system :-

Hardware & software components,
Hardware components like CPU,
I/O devices,
storage devices, VDU etc.
Software components like system software, application software.
Basic architecture of a computer system

3.Types of Computer : Mini, Super, Mainframe, Workstation, Personal,
Multimedia, Super Computer,

4.Number System : Decimal, Binary, Octal, Hexadecimal, 1's and 2's Complement,
floating Point representation,
Character Codes- ASCII, EBCDIC,

5.Programming languages :-

Need of a programming language,
Classification of languages like high level & low level ,
Machine language & assembly language ,
Higher level language with examples ,
Generations of programming languages with examples.

6.System Software :

Overview of all system softwares : Operating system ,
I/O manager ,
Assembler , Compiler , Linker , Loader

7.Operating system :-

Overview Different roles played by O.S. ,
Memory management, I/O management & resource management ,
Scheduling , Basic O.S. architecture ,
Introduction to popular O. S. like windows, Dos & Unix ,
Typical commands of each O. S.

8.Introduction to networking:-

Need for networking,
Issues involved in networking ,
Different networking models like LAN, WAN, client –server, distributed etc. ,
Internet and internet working with its usage

9.Introduction to Microprocessor :

Evolution, Architecture,
Memory Structure,
Comparative Study of Microprocessor Chips

10.Office Tools : Word , Excel softwares

Word : Structure of a Document, Common Commands, Styles, Cross Reference.
Excel : Concept of Spreadsheet, use of financial and statical functions, sorting and searching database, linking workbooks, formula between workbooks

Term work /Practicals : Each candidate will submit a journal in which at least 10 practical assignments based on the above syllabus will be submitted with the internal test paper. Test graded for 10 marks and Practical's graded for 15 marks.

Books recommended :-

1. "Computer fundamentals" Rajaraman V.
2. Computer fundamentals P.K. Sinha
3. Inside PC Peter Norton
4. Fundamentals of Information Technology Alexis Leon, Methews Leon, Vikas Publishing.

Paper 3

Computer Organization and Architecture

One paper : 100 marks / 3 hour duration

Assignment + test : 25 marks

1. Boolean Algebra, K-Maps, Combinational circuits, Flip-flops(J-K, S-R, D), Registers (Shift, Parallel), Counters (Ripple, Synchronous), Multiplexers and decoders
2. Principles of Computer Design
Software, hardware interaction layers in computer architecture, Organisation and Architecture ,Structure & Function. Design Levels - Gate, Register, Processor Instruction Sets : Characteristics & Functions, Addressing Modes & Formats Instruction cycle and execution cycle. System Buses, Interconnection Structures including bus Interconnection.
3. Grey Code, Excess -3 code, Error detecting and correcting codes
4. Control unit
Data path and control path design, Microprogramming vs hardwired control, RISC vs CISC, Pipelining in CPU design, Superscalar processors. Overview of Parallel Processing
5. Memory system
Memory Hierarchy, Memory technologies- Memory array organization, Memory device characteristics, Random-access memories, Serial access memories , SRAM, DRAM.

6.High Speed memories :-

Interleaving, Cache , Associative memory, Advanced DRAM Organisation

7.External Memory :

Magnetic Disk, RAID , Optical Memory.

8.Input-output devices and characteristics.

Input-output processing, I/O Modules, Programmed I/O, Interrupt Driven I/O, DMA,I/O channels and Processors.

9.Performance evaluation – SPEC marks, Transaction processing benchmarks.

Term work/ Assignment : Each candidate will submit a journal in which at least 10 assignments based on the above syllabus will be submitted with the internal test paper. Test graded for 10 marks and assignments graded for 15 marks.

References books :

1. “Computer Organisation and Architecture”, Stallings, W Prentice Hall of India, New Delhi
2. “Computer Organisation and Architecture”, Hayes P.John McGrawHill International Editions.
3. “Computer System and Architecture”, Mano, M. Prentice Hall of India,
4. “Computer organization and Design”. Pal Chaudhauri P Prentice Hall of India
5. “Introduction to Digital Computer Design”, Rajaraman V. and RadhaKrishnan T Prentice Hall of India

Paper 4

Discrete Mathematics

One paper : 100 marks / 3 hour duration

Assignments+ test : 25 marks

1. Propositions and logical operations
Notation, Connections, Normal forms, Truth Tables
Equivalence and Implications,
Theory of inference for statement calculus, Predicate calculus
Rules of Logic
Mathematical Induction and Quantifiers
2. Sets, Relations and Digraphs
Review of set concepts
Relations and digraphs
Properties of relations

Equivalence relations
Computer representation of relations and digraphs
Manipulation of relations
Partially Ordered Sets (Posets)

3. Graph theory :
Definition, paths, circuits, reachability, connectedness.
Matrix representation of graphs, trees, spanning trees
List structures and graphs , PERT related techniques
Transitive closure, Warshall's Algorithms
Eularian and Hamiltonian graphs
Storage representations and graphs
- 4 Groups and applications :
Monoids , semigroups
Product and quotients of algebraic structures
Isomorphism, homomorphism , automorphism
Normal subgroups ,Codes and group codes

- 5.Overview of Formal Languages :
Representation of special languages and grammars,
finite state machines.

Term work/ Assignment : Each candidate will submit a journal in which at least 10 assignments based on the above syllabus will be submitted with the internal test paper. Test graded for 10 marks and assignments graded for 15 marks.

Books :

1. "Discrete Mathematical Structures" : Tremblay and Manohar, McGraw Hill
2. "Discrete Mathematical Structures " : Kolman, Busby and Ross, Printice Hall India, Edition 3.
3. "Elements of Discrete Structures" : C.L.Liu

Paper 5

Accounting and Managerial Economics

One paper : 100 marks / 3 hour duration

Assignments+ test : 25 marks

1 Accounting process and principles, financial, cost and management accounting.

- 2 Elements of bookkeeping, Journal, cash and bankbook, Bank reconciliation statement, Ledger, trial balance, profit and loss accounts, final accounts of Proprietary and partnership concerns and Balance Sheet.
- 3 Cost accounting – Objectives, elements of cost, understanding of the different methods of costing.
- 4 Budgeting – budgets, purpose, budgetary control, preparation of budgets, master budget, fixed and flexible budgeting.
- 5 Introduction to Managerial Economics- Nature and Scope of Managerial Economics, Economic Theory and Managerial Economics, Managerial Economist- Role and Responsibilities.
- 6 Demand – law of demand, elasticity of demand, supply function, elasticity of supply, market equilibrium.
- 7 Demand forecasting - survey methods, evaluation of forecast accuracy
- 8 Cost – output relationship. Economies and Diseconomies of scale. Cost control and cost reduction. Break-even analysis.
- 9 Market structures – Perfect and imperfect competition, Monopoly, Oligopoly, Monopolistic Competition, Price Discrimination, Price and Output Decisions under different market structures. Government intervention in pricing.

Term work/ Assignment Each candidate will submit a journal in which at least assignments based on the above syllabus will be submitted with the internal test paper. Test graded for 10 marks and assignments graded for 15 marks.

Reference books :

- 1 “Managerial Economics” Varshney, Maheshwari, Sultan Chand,
- 2 “Managerial Economics” Dean Joel, PHI, 2001.
4. “Managerial Economics” D.N. Dwivedi Vikas Publishing House
5. “Book Keeping and Accountancy” Choudhari, Chopde
- 4 “Cost Accounting” : Choudhari, Chopde
- 5 “Managerial Economics”. Naylor, Vernon, Wertz
- 6 “Management Accounting Principals and Practice” : M. A. Sahaf