Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal(M.P.)

Scheme of Examination

First Semester- Master of Computer Application

S.No.	Subject Code	Subject Name	Periods per week			Credits	Maximum Marks (Theory Slot)			Maximum Marks (Practical Slot)		Total Marks
			L	T	P		End Sem. Exam	Tests (Two)	Assignments /Quiz	End Sem. Practical/ Viva	Practical Record/Assignment/Quiz/Presentation	
1.	MCA 101	Information Tech.	3	1	-	4	70	20	10		-	100
2.	MCA 102	Mathematical Foundation of Comp. Science	3	1	-	4	70	20	10	-	-	100
3.	MCA 103	Prog. and problem solving in C	3	1	-	4	70	20	10	-	-	100
4.	MCA 104	Computer organization and Assembly Lang. Prog	3	1	-	4	70	20	10	-	-	100
5.	MCA 105	Comm. skills	3	1	-	4	70	20	10	-	-	100
6.	MCA 106	Prog. Laboratory in C	-	-	8	8	-	-	-	120	80	200
7.	MCA 107	Assembly Language Prog. Lab	-	-	2	2	-	-	-	30	20	50
		Total	15	5	10	30	350	100	50	150	100	750

L: Lecture - T: Tutorial - P: Practical

w.e.f. July-2010

MCA-101 Information Technology

UNIT-I

Basic concepts of IT, concepts of Data & Info, data processing, history of computers (generation, type of languages), organization of computers, I/O devices, storage devices, system software, application software, utility packages, numerical based on storage devices.

UNIT-II

Assembler : Elements of assembly language programming, a simple assembly scheme, pass structure of assembler, design of two pass assemblers, a single pass assemblers.
Macros & Macro Processors : Macro definition & Call, Macro expansion Nested macro calls, advanced macro facilities, design of macro processors.

UNIT-III

Compilers & Interpreters : aspects of compilation, memory allocation, compilation of expression compilation of control structures, code optimization, interpreters.
Software Tools : Software tools for program development, editors, debug monitors, programming environment, user interfaces.

UNIT-IV

Linker & Loaders : Relocation & linking concepts, design of linkers, self relocating programs, a linker for MS DOS, linking for overlays, loaders : A two pass loader scheme, Relocating loaders, subroutine linkage, Direct linkage loader, Binders overlays.

UNIT-V

Sequential file organisation, random file organisation, index structure, indexed file organisation, alternate key indexed sequential files, multi key organisation, multi key access, multi list file organisation, inverted files & their definitions, insertion, deletion, operations with optimum utilization of memory, comparison of various type of file organisation.

BOOKS

1. D.M. Dhamdhere " System Programming & O.S." 2nd Ed., Tata Mc. Graw Hill.
2. J. Donovan "System Programming" THM.
3. Rajaraman V. "Fundamental of Computers" (4nd edition.) Prentice Hall of India, New Delhi 2004.
4. Sardes D.H. "Computer's today" McGraw Hill 1988.
5. S.Jaiswal, "Fundamental of Computer & IT", Wiley dreamtech India..

Note : Paper is to be set unit wise with internal choice.

MCA-102 Mathematical Foundation of Computer Science

UNIT-I

Sets, Relations and Functions:

Sets, Subsets, Power sets, Complement, Union and Intersection, Demorgan's law Cartesian products, Relations, relational matrices, properties of relations, equivalence relation, functions ,Injection, Surjection and Bijective mapping, Composition of functions, the characteristic functions and Mathematical induction.

UNIT-II

Proportions & Lattices :

Proposition & prepositional functions, Logical connections Truth-values and Truth Table, the algebra of prepositional functions-the algebra of truth values-Applications (switching circuits, Basic Computer Components).

Partial order set, Hasse diagrams, upper bounds, lower bounds, Maximal and minimal element, first and last element, Lattices, sub lattices, Isotonicity , distributive inequality, Lattice homomorphism, lattice isomorphism ,complete lattice ,complemented lattice distribution lattice .

UNIT-III

Groups and Fields:

Group axioms ,permutation group, sub group, co-sets, normal subgroup, semi group, Lagrange theorem, fields, minimal polynomials, reducible polynomials, primitive polynomial, polynomial roots, applications.

UNIT-IV

Graphs:

Finite graphs, incidence and degree, isomorphism, sub graphs and union of graphs, connectedness, walk, paths, and circuits Eulerian graphs ,tree properties of trees, pendant vertices in tree, center of tree ,spanning trees and cut vertices, binary tree ,matrix representation of graph, incidence and adjacency matrix and their properties, applications of graphs in computer science.

UNIT-V

Discrete Numeric function and Recurrence relation:

Introduction to discrete numeric functions and generating functions introduction to recurrence relations and recursive algorithms, linear recurrence relations with constant coefficients, homogeneous solutions, particular solutions and total solutions

BOOKS

1. J.P.Trembley & R.P.Manohar "Discrete Mathematical Structure with applications to Computer Science".
2. Kenneth H. Rosen-203 "Discrete Math & its Applications" 5th ed.
3. K.A. Ross and C.R.B. Writht "Discrete Mathematics ".
4. Bernard Kolman & Robert C. Busby "Discrete Mathematical Structures for Computer Science".

Note : Paper is to be set unit wise with internal choice.

MCA-103 Programming and Problem Solving in C

UNIT-I
An overview: Problem identification, analysis, design, coding, testing & debugging, implementation, modification & maintenance; algorithms & flowcharts; Characteristics of a good program - accuracy, simplicity, robustness, portability, minimum resource & time requirement, modularization; Rules/ conventions of coding, documentation, naming variables; Top down design; Bottom-up design.

UNIT-II
Fundamentals of C Programming: History of C; Structure of a C Program; Data types; Constant & Variable, naming variables; Operators & expressions; Control Constructs – if-else, for, while, do-while; Case switch statement; Arrays; Formatted & unformatted I/O; Type modifiers & storage classes; Ternary operator; Type conversion & type casting; Priority & associativity of operators.

UNIT-III
Modular Programming: Functions; Arguments; Return value; Parameter passing – call by value, call by reference; Return statement; Scope, visibility and life-time rules for various types of variable, static variable; Calling a function; Recursion – basics, comparison with iteration, types of recursion- direct, indirect, tree and tail recursion, when to avoid recursion, examples.

UNIT-IV
Advanced Programming Techniques: Special constructs – Break, continue, exit(), goto & labels; Pointers - & and * operators, pointer expression, pointer arithmetic, dynamic memory management functions like malloc(), calloc(), free(); String; Pointer v/s array; Pointer to pointer; Array of pointer & its limitation; Function returning pointers; Pointer to function, Function as parameter; Structure – basic, declaration, membership operator, pointer to structure, referential operator, self referential structures, structure within structure, array in structure, array of structures; Union – basic, declaration; Enumerated data type; Typedef; command line arguments.

UNIT-V
Miscellaneous Features: File handling and related functions; printf & scanf family;C preprocessor – basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef; Variable argument list functions.

BOOKS:
1. Kerninghan & Ritchie "The C programming language", PHI
2. Schildt "C:The Complete reference" 4th ed TMH.
3. Cooper Mullish "The Spirit of C", Jaico Publishing House, Delhi
4. Kanetkar Y. "Let us C", BPB.
5. Kanetkar Y.: "Pointers in C" , BPB
6. Gottfried : "Problem Solving in C", Schaum Series
7. Jones, Harrow Brooklish "C Programming with Problem Solving", Wiley Dreamtech India.

Note : Paper is to be set unit wise with internal choice.

MCA-104 Computer organization and Assembly Language Programming

UNIT-I

Representation of Information: Number systems, integer and floating-point representation, character codes (ASCII, EBCDIC), Error detection and correction codes : parity check code,cyclic redundancy code,Hamming code . Basic Building Blocks: Boolean Algebra, Simplification of Boolean Function. Combinational blocks: gates, multiplexers, decoders,Implementation of Boolean Function in form of gates etc. Sequential building blocks: flip-flops, Registers : Buffer register, Right &Left Shift register, Bidirectional Shift register. Counters : Ripple counter,Binary Counter,MOD-10 Counter,Ring Counter. ALU, Random access memory etc.

UNIT-II

Register Transfer Language and Micro-operations: concept of bus, data movement among registers, a language to represent conditional data transfer, data movement from/to memory. Design of simple Arithmetic & Logic Unit & Control Unit, arithmetic and logical operations Along with register transfer, timing in register transfer.

UNIT-III

Architecture of a simple processor: A simple computer organization and instruction set, instruction formats, addressing modes, instruction cycle,instruction execution in terms of microinstructions, interrupt cycle ,concepts of interrupt and simple I/O organization,Synchronous & Asynchronous data transfer,Data Transfer Mode : Program Controlled, Interrupt driven, DMA(Direct Memory Access). implementation of processor using the building blocks.

UNIT-IV

Assembly Language programming: Pin Diagram of 8086, Architecture of 8086,Addresing Mode of 8086,detailed study of 8086/8088 assembly language, instruction set of 8086, loops and Comparisons, conditions and procedures, arithmetic operations in assembly language. Simple Assembly Language program of 8086. illustrations using typical programs like: table search, subroutines, symbolic and numerical manipulations and I/O.

UNIT-V

Memory organization: Secondary Memory, Primary Memory :Random access memory, Read Only memory basic cell of static and dynamic RAM, Building large memories using chips, Concept of segmentation & Paging, Associative memory, cache memory organization, virtual memory organization.

BOOKS

1. M. Morris Mano, “Computer System Architecture”, PHI, 3rd edition, 1993
2. Govindarajalu “Computer Architecture & Organisation”.
3. Liu and Gibson, “8086/8088 Micro processor Assembly Language”.
4. M.Mano “Digital Logic & Computer Design”
5. Malvino, “Digital Computer Electronics”.

Note : Paper is to be set unit wise with internal choice.

MCA-105 Communication Skills

UNIT-I
Communication
Meaning and process of communication, importance of effective communication, communication situation, barriers to communication. Objectives of communication, types of communication, principles of communication, essentials of effective communication.

UNIT-II
Media of Communication
Written, oral, face-to-tace, visual, audio-Visual, merits and demerits of written and oral communication.

UNIT-III
Communication Skills:
Developing communication skills; Listening; Speaking; Reading-Writing (Oral & Written). Body language; Utility of aids in Communication.

UNIT-IV
Spoken Skills
Preparing for oral presentation, conducting presentations; Debates; Seminar; Speeches; Lectures; Interviews; Telephonic Conversation; Negotiations; Group Discussions.

UNIT-V
Written Skills:
Preparing of bio-data, seminar, paper, bibliography, and official correspondence; Mechanics of writing; Formal & Informal writings, letters; paragraphing, precise, report writing, technical reports, length of written reports, organizing reports, writing technical reports; Creative writing; Common Errors in Language.

BOOKS:
1. Rajendra Pal and J.S. Korlahalli "Essentials of Business Communication" , Sultan Chand & Sons Publishers, New Delhi.
2. U.S.Rai & S.M. Rai "Business Communications" , Himalaya Publishing House.
3. Menzal and D.H. Jones "Writing a technical Paper", Mc Graw Hill, 1961.
4. Strategy and Skill "Business Communication", Prentice Hall New Jersey, 1987
5. Scot Ober "Contemporary Business Communication", Wiley India.

Note : Paper is to be set unit wise with internal choice.