University Centre for Distance Learning

Syllabi & Scheme of Examination
MCA/Msc-2nd Year

Chaudhary Devi Lal University

Sirsa (Haryana)

Website:- www.cdlu.ac.in

SCHEME OF EXAMINATION

MSc-2nd /MCA-2nd

Paper Code	Course Nomenclature	External Asst.	Internal Asst.	Time
231	Discrete Mathematical Structure	70	30	3Hrs
232	Data Structure	70	30	3Hrs.
233	Object Oriented Methodology using C++	70	30	3Hrs.
234	Software Engineering	70	30	3Hrs.
235	Operating Systems	70	30	3Hrs.
236	SW Lab-I (based on MCA/MSc-DE-22 & 23)	50	20	3Hrs.
237	SW Lab-II (based on MCA/MSc-DE-24 & 25) CASE Tools & Linux Shell Programming	50	20	3Hrs.
	Total	**600**		

Note: A student is required to score 50% marks in aggregate in order to pass the theory and practical examination. Minimum pass marks in the individual practical and theory sub-ject is 40% as explained above.

There will be 600 marks for practical and theory examination of which a candidate is required to score minimum of 300 marks in order to pass the examination.

MCA - MSc- 231

DISCRETE MATHEMATICAL STRUCTURE

Maximum Time: 3 Hrs.
Total Marks:- 70
Minimum Pass Marks: 40%

The question paper will consist of Ten questions. Candidates are required to attempt any five questions in all.

Group and Subgroups: Group axioms, Permutation Groups, Subgroups, Cosets, Normal subgroups, Semi-groups, FREE semi groups, applications, modular arithmetic, error correcting codes, grammars, languages, finite state machines.

Graphs: Directed and undirected graphs, chains, circuits, paths, cycles, connectivity, adjacency and incedence metrics, minima's path applications (Flow charts and state transition graphs, algorithms for determining cycle and minimam paths, polish notation and trees, flows in networks)

Lattice and Boolean algebra: Relation to partial ordering, lattices, hasse diagram, axi-omatic defmation of Boolean algebra as algebraic structures with two operations, ba-sic results, truth values and truth tables, the algebra applications (Switching circuits, gate circuits).

Finite Fields: Defmition, representation, structure, integral domain, irrudicible poly-nomial, polynomial roots, splitting fields.

References:

1. Alan Doer, Kenneth Levaseur; Applied Discrete Structure for Computer Science, Galgotia Publications Pvt. Ltd.
2. Seymour Lipschutz, Marc Lars Lipson: Discrete Mathematics, McGraw-Hill international editions, Schaum Series.
3. Kolman, Discrete Mathematical Structures, Pearson Education.
4. Johnson, Discrete Mathematics, 5/e, Pearson Education.
5 Bernald Bolman, Robert C. Busby,: Discrete Mathematical Structure for Computer Science, Prentice Hall of India Pvt. Ltd.
6 Kenneth G. Roden; Discrete Mathematics and its Applications, McGraw-Hill international editions, Mathematics Series.

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DATA STRUCTURE

Maximum Time: 3 Hrs.
Total Marks:- 70
Minimum Pass Marks: 40%

The question paper will consist of Ten questions. Candidates are required to attempt any five questions in all.

Introduction to Data Structures, Primitive and Composite, Arrays, Matrices, Sparse Matrices, String representation and manipulation, Stack, Queue, Dequeue, Linked lists, Trees, Binary trees, Threads, Binary tree, Balance tree, Different tree traversal algo-rithms, Representation of Graph and Applications, Various searching and sorting tech-niques, Hashing, Dynamic Memory Management.

Reference:

1. AndrewS. Tenenbaumet. aI., Data Stiucture Using C/C++; PHI New Delhi (1997).
2. Kamthane, Introduction to Data Structure in C, Pearson Education.
3. Trembley and Sorenson, An Introduction to Data Structure with Applications, McGraw-Hill International, Student Edition, New York (1984).
4. Seymour Lischutz, Data Structures, McGraw-Hill Book Company Schaum's Out-line Series, New York (1986).

MCA - MSc-233

OBJECT ORIENTED METHODOLOGY USING C++

Maximum Time: 3 Hrs.
Total Marks: 70
Minimum Pass Marks: 40%

The question paper will consist of ten questions. Candidates are required to attempt any five questions in all.

Object Model: Classes and objects, encapsulation and information hiding, data abstraction, responsibilities, collaboration and message passing, link and associations generalization and inheritance, aggregation, abstract classes, multiple inheritance, con-tainer classes, meta classes.

Object-Oriented Analysis and Design: Models, Domain analysis, static models, dynamic models, concurrent models, functional models, overview of Booch' sOOT and OOD approach the OMT and OOD approach, Responsibility-driven Design, Introduction to UML.

Implementing Object-oriented feature in C++, Type and classes, structure vs class, inheritance, aggregation, constructors, destructors, polymorphism, exception-handling, templates.

Reference:

1. Rumbaugh et. aI., Object Oriented Modeling and Design, Prentice Hall ofIndia 1998.
2. Booch Grady, Object Oriented Analysis & Design, Addison Wesley, 1994.
3. Kamthane, Object-Oriented Programming with ANSI and Turbo C++, Pearson Education.
4. Bhave, Object-Oriented Programming with C++, Pearson Education.
5. Booch Gardy et. aI., The Unified Modeling Language, Addison Wesley, 2000.
6. Stroustrup B., The C++ Programming Language, Addison-Wesley, 1993.
7. Balagurusami E., Object Oriented Programmming in C++, Tata McGraw-Hill, 1998.
8. Schildt, Herbert, C++ - The Complet~ Reference 2/e, Tata McGraw-Hill, 1998.

MCA - MSc-234

SOFTWARE ENGINEERING

Maximum Time: 3 Hrs.
Total Marks:70
Minimum Pass Marks: 40%

The question paper will consist of Ten questions. Candidates are required to at-tempt any five questions in all.

Software and software engineering: Software characteristics, software crisis, software engineering paradigms. Planning software project, Software cost estimation, project scheduling, personnel planning, team structure.

Software configuration management: Quality assurance, project monitoring, risk management. Software requirement analysis, structure analysis, object oriented analysis and data modeling, software requirement specification and validation.

Design and implementation of software design fundamentals: Design methodology (structure design and object oriented design) Design verification, Monitoring and Control, coding.

Software reliability: Metric and specification, fault avoidance and tolerance, excepation handling, defensive programming.

Testing: Testing fundamentals, White box and Black box testing, software testing strat-egies, unit testing, integration testing, Validation testing, System testing, debugging.

Software maintenance: Maintenance characteristics, maintainability, maintenance tasks, and maintenance side effects.

References:

1. Pressman, S. Roger, Software Engineering, TataMcGraw-Hill.
2. Jalote Pankaj, An Integrated Approach to Software Engineering, Narosa Publishing House, New Delhi.
3. Sommerville, Ian, Software Engineering, 51 ed., Addison Wesley-2000.
4. Fairley, Richard, Software Engineering Concepts, Tata McGraw Hill.

MCA - MSc-235

OPERATING SYSTEMS

Maximum Time: 3 Hrs.
Total Marks: 70
Minimum Pass Marks: 40%

The question paper will consist of Ten questions. Candidates are required to attempt any five questions in all.

Introduction, Concept: Operating system function and characteristics, historical evolu-tion of operating systems, Real time systems, Distributed systems, Methodologies for implementation of O/S service, system calls, system programs, Interrupt mechanisms

File System: Function of the system, File access and allocation methods, Directory Structure, file protection mechanisms, implementation issue, hierarchy of file, disk scheduling policies.

Process Scheduling: Process, PCB, state transition, Level of Scheduling Comparative study of scheduling algorithms.

Storage Management: Storage allocation method, Single contiguous allocation, Mul-tiple contiguous allocation, Paging, Segmentation, combination of Paging and Seg-mentation Virtual memory concepts, Demand Paging, Page replacement Algorithms, Thrashing.

Deadlock: Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery, practical considerations.

Concurrent Processes: Critical section problem, Semaphores, Classical process co-ordination problems and their solutions, Inter-process Communications.

Protection: Goals of protection, mechanism policies, implementation, dynamic pro-tection structures, revocation.

Case Studies' Comparative study of DOS system.

Reference:

1. Peterson J.L. and Silberschatz A., Operating System Concept, Addison Wesley Reading.

2. Tanenbaum, Andrew, S., Operating System,