

# University Centre for Distance Learning



**Syllabi & Scheme of Examination  
MCA-3<sup>rd</sup> Year**

## Chaudhary Devi Lal University Sirsa (Haryana)

Website:- [www.cdlu.ac.in](http://www.cdlu.ac.in)



# SCHEME OF EXAMINATION

## MCA - Third Year

Paper Code	Course Nomenclature	Ext. Ass.	Inter. Ass.	Min. Pass Marks	Time
MCA-341	System Simulation	70	30	35	3Hrs
MCA-342	Computer networks	70	30	35	3Hrs
MCA-343	Visual Programming with VB and VC++	70	30	35	3Hrs
MCA-344	JAVA Programming and Internet Applications	70	30	35	3Hrs
MCA-(345-348)	Elective	70	30	35	3Hrs
MCA-349	SW Lab-I (Based on MCA-DE-33)	50		20	3Hrs
MCA-350	Dissertation	250		100	
	Total	800			

List of Elective Paper:

- (i) Computer Architecture and Parallel Processing
- (ii) Data Mining and Data Warehousing
- (iii) Artificial Intelligence
- (iv) Computer Graphics and Multimedia

**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 subject is 40% as explained above.

There will be 800 marks for practical and theory examinations of which a candidate is required to score minimum of 400 marks in order to pass the examination

## **MCA-341**

### **SYSTEM SIMULATION**

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 of System, stochastic activities, continuous and discrete systems, system modeling, principal used in modeling.

**Simulation:** Concept of simulation, steps in simulation experiment Benefits of simulation and its pitfalls, discrete system simulation continuous system. Generation of random numbers, Generation of non-uniformly distributed random numbers.

**Simulation Of Queuing Systems:** Basic concept of queueing theory, Simulation of single server, two server and general queueing systems.

**Simulation of Inventory Control And Forecasting:** Elements of inventory theory, inventory models, Generation of Poisson and Erlang variates, forecasting and regression analysis.

**Design And Evaluation Of Simulation Experiments:** Experiment layout and validation.

**Simulation Languages:** Continuous and discrete simulation languages, Block Structured continuous simulation languages, Expression based languages, Discrete system simulation languages, GPSS SIMSCRIPT SIMULA, Factors in selection of discrete system simulation languages.

#### **References:**

1. Gordon Geoferry: "System Simulation, Prentice-Hall of India Pvt Ltd New Delhi-1993
2. Narsing Deo, "System Simulation with Digital Computers" PHI New Delhi 1993.
3. Payne James, An Introduction to Simulation Programming Technique and Method of Analysis, McGraw-Hill International Editions Computer Science Series New York( 1998).

## MCA-342

### COMPUTER NETWORKS

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.

Network Concepts: Goals and applications of Computer Networks, Distributed processing, Topologies, Categories of Networks, LAN, MAN, WAN, Internet works point-to-point and multipoint configuration, broadcast networks, Introduction to SMDS,

X.25 Networks, ISDN, frame relay and ATM networks.

Network architecture: Concept of protocol services, OSI model and function of its layers TCP/IP reference model.

Data communication concept: Component of data communication, system transmission modes, transmission media, guided and wireless media. Introduction to switching (circuit message and packet), multiplexing (frequency division and time division), concept of Modems.

Framing and Error control: Framing techniques, Error control, error detection and correction.

Data Link Control: Acknowledgments Elementary data-line protocols, Automatic Repeat Request, Sliding Window protocols.

Medium Access Control and LAN: Multiple Access protocol of MAC sublayer, ALOHA I-persistent and p-persistent, CSMA, CSMA/CD.

Collision free protocols, Limited contention protocols, Wavelength Division Multiple Access, MACA, GSM, CDPD, CDMA, IEEE Standard 802. for LAN and MAN, Ethernet, token bus, token ring, DQDB , FDDI.

Routing: Oetenninistic and Adaptive routing, Centralized and distributed routing, shortest-path, flooding, flow based, optimal distanc vector, link-state, hierarchical routing for mobile hosts, broadcast and multicast routing.

Congestion control: Principle of congestion control, Traffic shaping, choke packets, load shedding.

TCP/IP: TCP/IP and the Internet transmission control protocol, user datagram protocol, Internet protocol.

Application layer: Network Security-cryptography and authentication, Simple Network management protocol.

#### Reference:

1. Computer Networks, Andrew S. Tanenbaum, Prentice Hall of India.
2. Kurose, Computer Networks, Pearson Education. .
3. Introduction to Data Communication and Networking, Forouzan, B., Tata Mc-Graw Hill. Data and Computer Communications, fifth edition, Williani Stallings, Prentice Hall of India.

## **MCA-343**

### **VISUAL PROGRAMMING WITH VB AND VC-++**

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.

The VB Integrated Development Environment and its elements: Menu bar, tool bars, project explorer, toolbox, properties window, form designer, form layout etc.

The VB language and its elements: Variables, constants, arrays, collections, subroutines functions, arguments and control structures.

Designing VB applications: Working with VB forms, form properties, adding, deleting and managing form at run time, coding event procedures, form designing, adding an interface at forms, attaching code to events dynamic menu appearance.

Coding VB application: Implementing user interface controls, command controls and their properties, dynamic controls, custom controls, control arrays, using variables, subroutines, functions and control structures, accessing data through code and data controls, using DLL in VB applications, building ActiveX components, ActiveX documents and web-enabled applications.

Database programming and object oriented programming with VB.

#### **Reference:**

1. Visual Basic by Howard Hawee, Prentice Hall of India.
2. Mastering VB, Evangelos Petroustos, Tata McGraw Hill.
3. Programmin in VB 6.0, Julia C. Bradley et. al., Tata McGraw Hill.
4. Visual Basic 6.0, The Complete Reference, Jerke, Tata McGraw Hill.

## **MCA-344**

### **JAVA PROGRAMMING AND INTERNET APPLICATIONS**

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.

Internet Applications: Introduction to Internet; e-mail architecture & Services, user agent, message format & transfer.

SMTP, World Wide Web(WWW)- Domain Name System, The Client Side, The Server Side, Creating and locating information on the web, search engines, URL's HTTP, FTP, JELNET; Web Browser, Chat & Bulletin Board, USENET & NNTP (Network News Transfer Protocol)

Java and the Internet: The Java Programming languages and its characteristics; Java runtime environment; Java compiler; Java developers kit; compiling Java application and Java applets.

Java Programming: Elements of Java: Data Types, scalar data types, operators & expressions, control structures. Class, Objects & methods, constructors, finalizer, visibility controls, Array, string & vectors. Inheritance, interfaces, packages, multithreading, applet programming.

Exception Handling- Defining and throwing exceptions, creating your own exceptions. Input/Output: Streams, byte and character stream the class printstream, data stream, string Tokenizer class, stream tokenizers.

Delegation Event Model, AWT classes, AWT controls, Layout managers & menus.

#### References:

1. Computer Networks and Internets, Second Edition - Douglas E. Comer, Addison-Wesley, 2000
2. Programming the Internet with Java, Revised Edition - Darrel Ince & Adam Free man, Addison Wesley, 2000
3. Programming with Java-.E. Balaguruswami, Second Edition, TMH-1998.
4. The Complete Reference Java 2. Fourth Edition - Herbert Schildt (TMH), 2001
5. A Programmer's Guide to Java Certification - Mughal K.A. Rasmussen, R.W., Addison-Wesley, 2000

## MCA-345

### COMPUTER ARCHITECTURE AND PARALLEL PROCESSING

Maximum Time: 3hrs.  
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.

Fundamentals: Computational Model, Evolution of Computer Architecture, process thread, concurrent and parallel execution, types and levels of parallelism, classifications of parallel architectures, relationships between languages and parallel architectures.

Instruction Level-Parallel Processors: Dependencies between instruction, principles of pipelining, linear pipeline-clocking and timing control, speedup, efficiency & through-put. Non linear pipeline-reservation table, latency analysis, collision free scheduling, internal data forwarding. Superscalar pipeline design-structure, data dependencies, pipeline stealing, in-order issue, out of order issue. VLIW architecture. Branch Handling-delayed branching, branch processing, multiway Branching, Guarded execution. Code scheduling-Basis block scheduling, Loop Scheduling, Global Scheduling.

Memory Hierarchy Technology: Inclusion, Coherence & locality, Virtual memory Models, TLB, Paging & Segmentation, Memory Replacement Policies, Cache Addressing Models, Cache Performance issues, Interleaved Memory Organization.

Shared Memory MIMD Architectures: Dynamic Interconnection Networks-Shared Paths, Switching Networks-Crossbar & Multistage Networks, Cache Coherence Problem, hardware based cache coherence protocol-snoopy cache protocol, directory scheme, scalable coherent interface, hierarchical cache coherence protocol, UMA, NUMA, CC-NUMA & COMA Multiprocessors.

#### References:

1. Sima.D. et. al., Advanced Computer Architecture, Addison Wesley, 2000.
2. Hwang, Kai, Advanced Computer Architecture, McGraw Hill International Ed.
3. Hwang.Kai, Briggs Faye.A, Computer Architecture & Parallel Processing, Mc Graw Hill International Ed.

## MCA-346

### DATA MINING AND DATA WAREHOUSING

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.

**Extended-Model:** Subclasses, Super classes and Inheritance Specialization and Generalization Constraint and Characteristics Specialization and Generalization.

**Object-Oriented Data Model:** Object Identity, Object Structure and Type Constructors Encapsulation of Operations, Method and Persistence Type Hierarchy and Inheritance Complex Objects Polymorphism Multiple Inheritance Version and Configurations.

**Object Relational Database:** Basic Concept of Object-Relational Systems Object Relational feature of Oracle A Overview of SQL3 Object-Relational support in SQL3 Nested Relational Data Model.

**Further Normalization:** Higher Normal Forms Multivalued Dependencies and Fourth Normal Form Join Dependencies and Fifth Normal Forms Domain-Key Normal Form.

**Database System Architecture:** Centralized Systems Client-Server Systems Server System Architecture Parallel Systems Distributed Systems.

**Distributed Database and Client-Server Architecture:** Distributed Database Concepts Data Fragmentation Replication and Allocation Technique for Distributed Database Design Type.

**Distributed Database Systems:** Overview of Concurrency Control and recovery in Distributed Databases

**A Overview of Client-Server Architecture Distributed Database in Oracle. Data Warehousing:** Characteristics of Data Warehouses Data Modeling for Data Warehouses, Building Data Warehouse, Functionality of Data Warehouses Difficulties implementing Data Warehouses.

**Data Mining:** A Overview of Data Mining Technology, Association Rules, Application to Data Mining, state-of-the-art Commercial Data Mining Tools.

**Web Interface to Database:** Web Fundamentals Database and the Web, Web Server and Sessions Providing access to Database of WWW Through Oracle Webserver. Performance Tuning Performance Benchmarks.

**Enhance Data Model for Advanced Application:** A overview of Active Databases Spatial Databases Deductive Database and Multimedia Databases.

#### References:

1. Elmasri, Navathe, Fundamentals of Database systems, 3rd ed, Addison Wesley
2. Korth & Silberschatz, Database System Concepts, 4th Edition, McGraw Hill
3. C. J. Date, An Introduction to Database System, 7th ed, Addison Wesley
4. BC Desai, An Introduction to Database System, Galgotia Publication
5. Roiger, Data mining, Pearson Education.
6. Adriaans, Data Mining, Pearson Education.
7. Dunham Sridhar, Data Mining: Introductory and Advanced Topics, Pearson Education.
8. Marakas, Modern Data Warehousing, Mining, and Visualization: Core Concepts, Pearson Education.



## MCA-347

### ARTIFICIAL INTELLIGENCE

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.

AI and its importance history of AI application areas. Problem representation State space representation problem-reduction representation production system

Logics Propositional logic syntax and semantics First order predicate logic (FOPL) syntax and semantics conversion to clausal form inference rules unification and the resolution principle.

Structure knowledge Associative networks Frame structures Conceptual dependencies and scripts.

Object-oriented representation overview of object oriented systems objects classes message and methods.

Rule base knowledge representation procedural and declarative knowledge forward and backward reasoning matching control knowledge.

Search and control strategies Data driven and goal driven search Uniformed search, depth first and breadth first search heuristic search admissibility monotonicity and informedness using heuristic in games.

Learning Type of learning, learning by induction failure, supervised learning learning by telling learning exploration.

Expert system architecture Rule based architecture Non-production system architecture Stages of expert system development Expert system applications Knowledge acquisition and validation Knowledge system building tools.

#### Reference:

1. George F. Luger William, A Stubblefield Artificial Intelligence The Benjamin/Cumming Publishing Company Inc.
2. Patterson, Introduction to Artificial Intelligence and Expert System, PHI.
3. Nile J. Nilsson, Principles of Artificial Intelligence, Narosa Publishing House.
4. Russel, Artificial Intelligence: A Modern Approach, 2/c, Pearson Education.
5. Winston, Artificial Intelligence, 3/e, Pearson Education.
6. Charniak, Introduction to Artificial Intelligence, Pearson Education.
7. Luger, Artificial Intelligence, 4/e, Pearson Education.

## MCA-348

### COMPUTER GRAPHICS AND MULTIMEDIA

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:** Survey of computer Graphics and its applications Interactive and passive graphics Introduction to GK primitives display processors;

**Graphic Device:** Display system-references CRT raster scan and random scan monitors, Grey shades Interlacing beam penetrating shadow mask monitors look up tables, plasma panels LED and LCD monitors VGA and SVGA resolutions Hard copy Devices-printers plotters Interactive Input Devices-mouse digitizing tablet light pen touch panels image scanners voice systems joy stick track ball.

**Drawing Geometry:** Coordinate system resolution Use of homogeneous coordinate system scan conversion: symmetrical simple DDA Bresenham's line drawing algorithm Circle drawing using DO and polar coordinates Bresenham's circle drawing algorithm generation of ellipse.

**2-D Transformation:** Translation rotation scaling mirror reflection shearing zooming panning input technique-pointing positioning rubber band methods and dragging tweening.

*Graphic operations:* Clipping-line clipping using Sutherland-Cohen and midpoint subdivision algorithm polygon clipping window and viewport windowing transformation Filling-stack base fill algorithm scan-line seed fill algorithm;

**3-D Graphics:** 3-D modeling of objects 3-D display techniques coordinate system 3-D transformation matrices for translation scaling and rotation parallel projection perspective projection Hidden-surface removal Z-buffer, back face scan-line depth-sorting area subdivision Shading modelling light intensities gouraud shading Phong shading.

**Multimedia:** Concept of Hypertext / Hypermedia multimedia applications multimedia authoring multimedia hardware images bitmaps windows paint brush.

Reference:

1. Donald Hearn & M. Pauline Baker, Computer Graphics, PHI.
2. Newmann & Sproull, Principles of Interactive Computer Graphics, MGH
3. F Koegel Buford, Multimedia Systems, Addison Wesley.
4. Foley et al, Computer Graphics - Principles Practice, Addison Wesley.
5. Rogers, Procedural elements of Computer Graphics, McGraw Hill.
6. D.P. Mukherjee, Fundamental of Computer Graphics and Multimedia, PHI.
7. Hearn, Computer Graphics, C Version, 2/e, Pearson Education.
8. Foley, Computer Graphics: Principles & Practice in C, 2/e, Pearson Education.