Appendix-A

Scheme of teaching and examination under Semester Pattern Choice Based Credit System (CBCS) for M.C.A. (Master in Computer Application) (2 Years)

First Year M.C.A. Semester I(Master in Computer Application) (CBCS)												
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme						
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks		
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract	
Paper 1 Core	1T1 Advanced Java Programming	4	-	4	4	3	80	20	100	40	-	
Paper 2 Core	1T2 Data Communication and Network	4	-	4	4	3	80	20	100	40	-	
Paper 3 Core	1T3 Open source Web Programming using PHP	4	-	4	4	3	80	20	100	40	-	
Paper 4 Core	1T4 Advanced DBMS and Administration	4	-	4	4	3	80	20	100	40	-	
Paper 5 Core	1T5 Software Engineering	4	-	4	4	3	80	20	100	40	-	
Practical 1	1P1 based on 1T1, 1T2 and 1T3	-	7	7	4	3	100	-	100	-	40	
Practical 2	1P2 based on 1T4 and 1T5	-	7	7	4	3	100	-	100	-	40	
	TOTAL	**20**	**14**	**34**	**28**		**600**	**100**	**700**	**350**		

Appendix-A

Scheme of teaching and examination under Semester Pattern Choice Based Credit System (CBCS) for M.C.A. (Master in Computer Application) (2 Years)

First Year M.C.A. Semester I(Master in Computer Application) (CBCS)											
Code	Theory / Practical	Teaching scheme (Hours / Week)			Credits	Examination Scheme					
						Duration in hrs.	Max. Marks		Total Marks	Minimum Passing Marks	
		Th	Pract	Total			External Marks	Internal Ass		Th	Pract
Paper 1 Core	1T1 Advanced Java Programming	4	-	4	4	3	80	20	100	40	-
Paper 2 Core	1T2 Data Communication and Network	4	-	4	4	3	80	20	100	40	-
Paper 3 Core	1T3 Open source Web Programming using PHP	4	-	4	4	3	80	20	100	40	-
Paper 4 Core	1T4 Advanced DBMS and Administration	4	-	4	4	3	80	20	100	40	-
Paper 5 Core	1T5 Software Engineering	4	-	4	4	3	80	20	100	40	-
Practical 1	1P1 based on 1T1, 1T2 and 1T3	-	7	7	4	3	100	-	100	-	40
Practical 2	1P2 based on 1T4 and 1T5	-	7	7	4	3	100	-	100	-	40
	TOTAL	**20**	**14**	**34**	**28**		**600**	**100**	**700**	**350**	

First Year M.C.A. Semester I(CBCS)

Paper 1 - 1T1 Credits: 4

Advanced Java Programming

Unit 1 :

Java and Internet, Features of java: security, portability, multithreading, etc, Bytecode, Datatypes, variables and Arrays, Operators, Classes : declaring objects, methods, constructor, overloading constructor, garbage collection, finalize() method, static variable and method, final variable, command line argument. Inheritance: super keyword, final with inheritance. Packages and Interfaces,Wrapper classes, Exception handling : Overview, types, Uncaught exception, try - catch block, multiple catch, nested try, throw, throws, finally, bulit-in and user- defined exception.

Multithreading : Life Cycle, Thread class and Runnable Interface, isAlive(), join(),Priorites, Synchronization : sleep() , run(). Interthreadcommunication : wait(), notify(), notifyAll(), deadlock. String Handling.

Unit 2:

Applet: Applet Class, Architecture, Life Cycle, Display methods, HTML APPLET Tag, Passing parameter to Applet

AWT : working with Windows, Controls, Layout Manager, Menus. Swings. Event handling.

Unit 3:

JDBC : Architecture, JDBC-ODBC bridge driver, SQL Package, ResultSet and its methods.

Networking : Socket, Reserve socket, Internet Addressing, InetAddress, TCP/IP client socket, TCP/IP server socket, URL, URL Connection, Datagram.

RMI : Introduction, Architecture, Remote Interface, java.rmi. server package, class naming, creating Rmi server and client ,transmitting files using rmi, client side callback, RMISECURITYMANAGER class, RMI Exception, Stub and Skeleton.

Unit 4:

Servlet : Life Cycle, Tomcat, javax. servlet package, reading servlet parameter, javax.servlet.http package, handling http request and response with HTTPGET and HTTPPOST, cookies,session tracking. JSP : Introduction, Types of JSP tags, Application using JSP and Servlet.

JavaBeans : Advantages of Beans, BDK, JAR files, Introspection, Developing Beans using BDK.

Books:

1. Complete Reference ,HerbertSchildt,TMH
2. Programming with Java , C Muthu ,McGraw Hill
3. Black Book on java

First Year M.C.A. Semester I (CBCS)

Paper 1 - 1T2 Credits: 4

Data Communication andNetwork

Unit 1 :

Introduction: Network structure and architectures and services OSI reference model.

The Physical Layer: theoretical basis for data communication, transmission media. Analog Transmission, Digital Transmission, Transmission and Switching, ISDN.

The Data Link Layer: Design issues, Error detection and correction, Elementary data link protocols, sliding window protocol, protocols performance, protocols specification and verification. Examples of the Data link layer.

Network Layer: Design issues, routing algorithms, Congestion control algorithms, Internet working, Examples of the network layer.

Unit 2 :

The Transport Layer: Design issues, Connection Management.

The session layer: Design issues and remote procedure call.

The Presentation Layer: Design issues, data compression techniques, cryptography.

The Application Layer: Design issues, file transfer, access and management, virtual terminals.

Unit 3 :

Network Security Fundamentals: Introduction, security Vulnerabilities and Threats, Classification of Security Services. Cryptography: Encryption principles, Conventional Encryption DES, IDEA, Algorithms, CBC, Location of Encryption Devices key Distribution.

Unit 4 :

Message Digests and Checksums, Message Authentication, Message Digests, Hash Functions and SHA, CRCs. Public key Systems: RSA Diffie-Heliman, DSS, Key Management.

Intruders: Intrusion Techniques, Intrusion Detection, Authentication, Password- Based Authentication, Address- Based Authentication, Certificates, Authentication Services, Email Security, Firewalls, Design Principles, Packet Filtering, Access Control, Trusted Systems, Monitoring and Management.

Books :

1. Computer Networks , Andrew S Tanenbum,PHI
2. Network Security and Essentials: Application and standers ,Willam Stalling, Pearson
3. Cryptography and network security ,Willam Stalling , Pearson Education.
4. Data Communication and Networking, Behrouz A. Forouzan, TMH.

First Year M.C.A. Semester I (CBCS)

Core

Paper 3 - 1T3 **Credits: 4**

Open Source Web Programming using PHP

Unit 1 :

Introduction:ABriefHistoryofPHP,InstallingPHP,PHP LanguageBasics:LexicalStructure,DataTypes,Variables,ExpressionsandOperators Flow-Control Statements IncludingCode,EmbeddingPHPinWebPages,InstallingandConfiguringPHPonWindows andLinuxPlatforms

Unit 2:

Functions:CallingaFunction,DefiningaFunction,VariableScope,FunctionParameters, Return Values,VariableFunctions,AnonymousFunctions,Strings:QuotingStringConstants,PrintingStrings ,AccessingIndividualCharacters,CleaningStrings,EncodingandEscaping,ComparingStrings,Mani pulating and, SearchingStrings RegularExpressions, POSIX-StyleRegularExpressions, Perl-Compatible Regular Expressions, Arrays: IndexedVersusAssociativeArrays, Identifying Elements of an Array, Storing Data inArrays,Multidimensional Arrays,ExtractingMultipleValues,ConvertingBetweenArraysand variables,TraversingArrays,Sorting,ActingonEntireArrays,UsingArrays

Unit 3 :

ClassesandObjects: Terminology, CreatinganObject,AccessingPropertiesandMethods,Declaring a Class,Introspection, Serialization,WebTechniques:HTTPBasics,Variables,ServerVariables,Server Information,ProcessingForms,Setting ResponseHeaders,Session,cookies,files,MaintainingState,SSL, UsingPHPtoAccessaDatabase: Relational Databases andSQL,Mysqldatabase Basics,Advanced DatabaseTechniques

Unit 4 :

Graphics: Embedding anImageinaPage,TheGDExtension,BasicGraphics concepts,Creatingand DrawingImages,ImageswithText,DynamicallyGeneratedButtons,ScalingImages,ColorHandling, **PDF:**PDFExtensions,DocumentsandPages,Text,ImagesandGraphics,Navigation,OtherPDFFeatu res, **XML:** LightningGuideto XML, GeneratingXML, ParsingXML, TransformingXML withSLT,Web Services,**Security:** Global Variables and Form Data, Filenames, File Uploads, File Permissions, ConcealingPHPLibraries,PHPCode,ShellCommands, SecurityRedux,ApplicationTechniques, Code Libraries,TinplatingSystems,HandlingOutput,ErrorHandling,PerformanceTuning.

Books :

1. PHP5.1forbeginners,EvanBayrossandSharmanShah,SPDPublications

2. ProgrammingPHP,RasmusLerdorfandKevinTatroe,OrillyPublications

First Year M.C.A. Semester I (CBCS)

Core

Paper 4 - 1T4 **Credits: 4**

Advanced DBMS and Administration

Unit 1 :

Relational Database design: Functional dependencies, and Normalization Normal forms based on primary keys (1 NF, 2 NF, 3 NF, BCNF, 4 NF, 5 NF) Loss less joins and dependency preserving decomposition Query Processing: Query Processing Stages, Query Interpretation, Equivalence of Expressions, Query Resource Utilization, Query Execution Plan, Estimation of Query Processing Cost, Multiple Index Access, Methods for Joining Tables (Nested Loop,Multiple Join) Structure of a Query Optimizer

Unit 2 :

Transaction Processing & Concurrency Control: Concept and definition of transaction, ACID properties, serializibility, Prioritization, states of transaction, Types of failure, desirable properties of transaction schedules and recoverability, serial usability of schedules, levels of transaction consistency, deadlocks, long duration transactions, transaction performance, transaction processing as implemented in contemporary database, management system. Concurrency Control, locking techniques, techniques based on time-stamp ordering, multiple granularity. Crash Recovery**:** failure classification, recovery concepts, database backup, recovery concepts based on deferred update and on immediate update. Shadow paging, check points, crash recovery techniques. Client/Server database:Evolution of client concept, Client/Server environment, characterization of Client/Server computing. Functions of clients server , application partitioning, the two-layer and three-layer architectures, communication between clients and servers.

Unit 3 :

Oracle Database Architecture and Administration: Oracle database architecture, Design, Creation, Management of Oracle Databases and related database schemes, Data Dictionary views and standard package Maintaining the control, Redo Log files, Managing Tablespaces and Data Files, Storage structure and relationships, Managing rollback segment, Indexes, Managing data Integrity, Managing password security and resources, Managing users, Privileges, roles. Oracle Backup and Recovery Strategies: Backup and recovery considerations, Oracle recovery structure and processes, Oracle backup and recovery configuration, Physical backup, Complete recovery of an Oracle database, Oracle Export / Import utilities, Oracle standby database.

Unit 4 :

Oracle Tuning and Troubleshooting:Oracle performance tuning methodology,'Oracle alert and trace files, Tuning the shared pool, Buffer Cache, Redo Log buffer, Database configuration and I/O issues, Using Oracle Blocks efficiently, Optimizing sort operations,Rollback segment tuning, Monitoring and detecting lock contention, SQL issues and tuning considerations for different

application. Integrity, Security:Need for Database Integrity, Integrity Constraints, Introduction to Database,Security issues.

Books :

1. Fundamental of Database Systems , R. ElmasriS. Navathe Benjamin Cummings
2. Database system concept ,Korth
3.Oracle 9i Performance Tuning, Joseph C. Johnson
4. DBA Handbook oracle press ,Loney

First Year M.C.A. Semester I (CBCS)

Core

Paper 5 - 1T5 **Credits: 4**

Software Engineering

Unit 1 :

Introduction to Software Engineering : The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of process : Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models : The waterfall model, Incremental process models, Evolutionary process models, The Unified process. Requirement Engineering **:**Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Unit 2 :

Requirements engineering process : Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models : Context Models, Behavioral models, Data models, Object models, structured methods. Modeling with UML .

Design Engineering : Design process and Design quality, Design concepts, the design model.

Creating an architectural design : Software architecture, Data design, Architectural styles and patterns, Architectural Design.

Unit 3 :

Object-Oriented Design : Objects and object classes, An Object-Oriented design process, Design evolution. Performing User interface design : Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

Testing Strategies : A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. Product metrics **:**Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Unit 4 :

Metrics for Process and Projects **:**Software Measurement, Metrics for software quality.

Risk management **:**Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management : Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.