Annexure No.	**31 K**
SCAA Dated	**29.02.2008**

BHARATHIAR UNIVERSITY, COIMBATORE-641 046.
MASTER OF SCIENCE – INFORMATION TECHNOLOGY
(*For The School of Distance Education -SDE)*

(For the candidates admitted during the academic year 2007 -2008 onwards)

SCHEME OF EXAMINATION

Year	Subject and Paper		University Examination	
			Duration in Hrs	Max marks
I	Paper I	Object Oriented Analysis and Design	3	100
	Paper II	Advanced Java Programming	3	100
	Paper III	Distributed Computing	3	100
	Paper IV	Multimedia Systems	3	100
	Practical I	Advanced Java Lab	3	100
II	Paper V	Programming in C# and .NET Framework	3	100
	Paper VI	Component Based systems	3	100
	Paper VII	Web Services	3	100
	Practical II	C# and .Net Programming Lab	3	100
		Project		100
		Total		1000

For the project work and viva-voce (External) the break-up is:
Project Evaluation : 75
Viva-voce : 25
Project Evaluation will be by External and Internal Examiners.

M.Sc (INFORMATION TECHNOLOGY)
For the School of Distance Education
YEAR I
PAPER I - OBJECT ORIENTED ANALYSIS AND DESIGN

Subject Description

This Course presents the object oriented analysis and design emphasizing the software engineering aspects, methodologies in object oriented techniques.

Goals

To enable the students to learn the object oriented techniques to system analysis and design.

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of object oriented methodoloies.
- Gained problem solving skills using developing object based models.

Contents

UNIT I

Object Orientation – System Development – Review of Objects – Inheritance – Object Relationships – Dynamic binding – OOSD life cycle – Process – Analysis-Design - Prototyping – Implementation – Testing – Overview of Methodologies

UNIT II

OMT – Booch methodology, Jacobson – Methodology – patterns – Unified approach – UML –Class Diagrams – Dynamic Modeling

UNIT III

Using Case model – Creation of classes – Noun Phrase approach – responsibilities – Collaborators and relationships – Super – Sub class - Aggregation

UNIT IV

OO Design axioms – Class visibility – refining attributes- Methods – Access layer – OODBMS – Class mapping view layer

UNIT V

Quality Assurance testing – Inheritance and testing - Test Plan – Usability testing – User satisfaction testing

References:

1. Ali Brahmi , " Object Oriented System Development" , *McGraw-Hill International Edition*
2. Object-Oriented Analysis and Design *by* Grady Booch, *Addison – Wesley*
3. Object Oriented Modelling and Design *by James Rumbaugh , Micheal Blaha, Prentice Hall*

YEAR I

PAPER II ADVANCED JAVA PROGRAMMING

Subject Description

This Course presents the Advanced Java programming techniques emphasizing problem solving using Java.

Goals : To enable the students to learn the Advanced Java.

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of problem solving using Java as a internet tool.
- Gained problem solving skills using advanced Java.

Contents

Unit I

Java Basics Review: Components and event handling – Threading concepts – Networking features – Media techniques

Unit II

Data structures in Java – Ordered structures – sorting – trees

Unit III

Advanced Networking and BEANS- Sockets- Content and Protocol Handlers – developing distributed applications – remote objects – object serialization – bean concepts – events in bean box- Bean –persistence

Unit IV

Java in Databases- JDBC principles – database access- Interacting- database search – Creating multimedia databases – Database support in web applications

Unit V

JAR file format creation – Internationalization – Swing Programming – Advanced java techniques

Reference:

1. Jane Jaworski, “Java Unleashed” , *SAMS Techmedia Publications 1999*
2. Campione, Walrath and Huml, *The Java Tutorial”, Addison Wesley 1999*

YEAR I

PAPER III DISTRIBUTED COMPUTING

Subject Description

This Course presents the distributed computing techniques emphasizing the client server model

Goals

To enable the students to learn the concepts of distributed computing

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of distributed computing

Contents

UNIT I

Distributed Systems: Fully Distributed Processing systems – Networks and interconnection structures – designing a distributed processing g system.

UNIT II

Distributed systems: Pros and Cons of distributed processing – Distributed databases – the challenges of distributed data – loading, factors – managing the distributed resources division of responsibilities.

UNIT III

Design considerations: Communication Line loading – line loading calculations- partitioning and allocation - data flow systems – dimensional analysis- network database design considerations- ration analysis- database decision trees- synchronization of network databases

UNIT IV

Client server network model: Concept – file server – printer server and e-mail server

UNIT V

Distributed databases: An overview, distributed databases- principles of distributed databases – levels of transparency- distributed database design- the R* project techniques problem of heterogeneous distributed databases

Reference:

1. John a. Sharp, “An introduction to distributed and parallel processing g” *Blackwell Scientific Publication(Unit I & III)*
2. Uyless D. Black, “Data communication and distributed networks”(unit II)
3. Joel M.Crichllow “introduction to distributed & parallel computing (Unit IV)
4. Stefans Ceri, Ginseppe Pelagatti “Distributed database Principles and systems” *McGraw Hill*

YEAR I

PAPER IV MULTIMEDIA SYSTEMS

Subject Description

This Course presents the elements of multimedia systems .

Goals

To enable the students to learn the concepts of multimedia systems

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of multimedia systems

Contents

UNIT I

Elements of Multimedia systems – Needs – Benefits – Converging of Multimedia application development, multimedia building blocks - Text – Sound – images – video - animation

UNIT II

PC Platform – SCSI , MCI(Media control interface), Storage for Multimedia – DVD &CD, Input devices and Output Hardware, communication devices, multimedia workstation

UNIT III

Hypertext – hypermedia – document architecture – MPEG, Basic tools – image forming, painting and drawing tools – sound editing programs, Video formats – quick time, Linking multimedia objects – OLE , DDE. Office suites – presentation tools- User interface design

UNIT IV

Application Subsystem , Transport subsystem , QOS, Synchronization, Presentation, Multimedia Synchronization- single user – multimedia on networks

UNIT V

Multimedia OS – Process Management – File handling , Multimedia DBMS – Data structures for storage – Indexing techniques – Information retrieval, Search Engine – Case study.

Reference:

1. Steinmetz and Klara Nahrstedt, “Multimedia Computing, communication and application”, *Pearson Education Asia, 1995*
2. Tay Vaughnan, “Multimedia: Making it work” 5th Edition, *Tata McGraw-Hill 2001*
3. Jeffcoat, “Multimedia in Practice- Technology and applications”, *PHI 1995*

YEAR II

PAPER V PROGRAMMING IN C# AND .NET FRAMEWORK

Subject Description

This Course presents the programming in C# and .Net framework

emphasizing problem solving using C#.

Goals

To enable the students to learn the concepts of . Net framework and C# language.

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of .Net framework
- Gained problem solving skills using C#.

Contents

UNIT I

Introduction to .NET frame work - . NET objects – ASP .NET - .NET Web services – Windows forms

UNIT II

Introduction to C# - Understanding c# in .NET - Overview of C# - Literals, variables and data types

UNIT III

Operators, Expressions, Branching and looping operations – Methods, Arrays, Strings

UNIT IV

Structures and Enumerations – Classes and Objects – Inheritance and Polymorphism, Multiple Inheritance

UNIT V

Operator overloading, Events, console I/O operations and Exceptions

References:

1. E. Balagurusamy, “Programming in C#”, *Tata McGraw-Hill, 2002*
2. David S. Platt, “Introducing Microsoft .NET”, *Microsoft Press, SAARC Edition, 2001*
3. Microsoft, “C# Language Specifications”, *Microsoft Press, 2001*

YEAR II

PAPER VI COMPONENT BASED SYSTEMS

Subject Description

This Course presents the elements of component based systems with an emphasis CORBA

Goals : To enable the students to learn the concepts of component based systems

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of component based systems

Contents

UNIT I

Concepts: Software Components – COM/DCOM- Java Beans – CORBA- Distributed objects, request and response – remote reference – IDL interface – proxy –Marshalling

UNIT II

Factory – Broker – Garbage collection on the Client and Server, Handling remote references – Transactions – Concurrency in Server Objects – Event driven programming

UNIT III

CORBA : Java programming with CORBA – Overview of Java ORBs – First Java ORBOMG IDL to Java mapping – ORB runtime system – Discovering Services(Naming and Building applications- advanced features(DSI, DII, Interface depository)CORBA Events-applications

UNIT IV

Distributed Object Database management: Object model features – fundamental object management and DOM architectures – object caching – object clustering – object migration – Query processing in Object DBMS –Transaction management in distributed object DBMS

UNIT V

COM – Distributed CO –COM- Facilities and services – Applying COM objects – Class – Factory components –servers –clients – object orientation infrastructure – transparency – concurrency – security – building components with ATL –ActiveX Controls

Reference:

1. Andreas Vogel, Keith Duddy “Java Programming with CORBA” *John Wiley & Sons*
2. *George Shepher Brad King “Inside ATL”, WP* Publishers and Distributors
3. Ozsu and Valduries “Principles of Distributed Database Systems “, *Prentice Hall*
4. “InsideCOM” *Microsoft Press*

YEAR II

PAPER VII WEB SERVICES

Subject Description

This Course presents the elements of web services with an emphasis building client server applications with XML

Goals : To enable the students to learn the concepts of web services

Objectives

On successful completion of the course the students should have:

- Understood the trends and principles of web services

Contents

UNIT I

Introduction to Web services – Industry standard, Technologies and concepts underlying web services – their support to Web Services, Application that consume Web Services.

UNIT II

XML – its choice for Web Services – Network protocol to backend data base – Technologies – SOAP, WSDL, exchange of information between application in distributed environment – Locating remote Web Services – its access and usage, UDDI Specifications – an introduction.

UNIT III

A brief outline of Web Services – conversation static and interactive aspects of systems interface and its implementation. work flow- Orchestration and Refinement, Transactions, Security issues – Common attacks – Security Attacks facilitated within Web Services – Quality of service - Architecting of system to meet users request with respect to latency, performance reliability, QOS metric, mobile and wireless services – energy consumption – Network bandwidth utilisation, portal and service management.

UNIT IV

Building real world enterprise application using Web Services – sample source codes to develop Web Services – steps necessary to build and deploy Web Services and Client application to meet customer's requirement – Easier development, customisations, maintenance, Transaction requirement, seamless porting to multiple devices and platform.

UNIT V

Development of Web services and application onto to meet application server and AXB SOAP server (both are freewares) – Web Services platform as a set of enabling technologies for XML based distributed computing.

Reference:

1. Sandeep Chatterjee, James Webber: "Developing Enterprise Web Services: An Architect Guide", Prentice Hall 2003.
2. Keith Ballinger "Net Web Server: Architecture and Implementation with .NET": Pearson Education 2003.
3. Anne Thomas Manes, "Web Server : A Manager Guide": Addison Wesley

HARATHIAR UNIVERSITY
MODEL QUESTION PAPERS - M.SC I.T (SDE)
I YEAR - PAPER I
OBJECT ORIENTED ANALYSIS AND DESIGN

Time: 3 hrs Marks:100 marks

ANSWER ANY 5 QUESTIONS (5 x 20 = 100)

1. a. Explain the OOSD life cycle in detail.
   b. Explain the four major elements of Object model.

2. a. Explain the different kinds of relationships among objects.
   b. Explain the identification of classes and objects.

3. a. Explain states events, scenarios and operations.
   b. State the uses of instant diagrams and state diagrams.

4. a. Explain the features of UML.
   b. Define OMT. How is the object oriented approach different from procedure oriented approach.

5. Give a detailed object model of
   a. A simplified window management system
   b. A simplified airline reservation system.

6. a. Explain strong and weak typing with examples.
   b. Explain the 2 kinds of hierarchies in OOAD.
   c. What are the different metrics used to measure the quality of abstraction?

7. a. Discuss use case analysis as described by Jacobson.
   b. What are the two processes involved in identification of key abstraction.
   c. Explain the components of a class diagram with an example.

8. a. State 6 corollaries of Object Oriented Design. Explain any four of them in detail with suitable examples.
   b. Explain aggregation.
   c. Discuss the noun phrase approach to identify objects and classes in an environment

BHARATHIAR UNIVERSITY
MODEL QUESTION PAPER M.SC I.T (SDE)
I YEAR– PAPER II
ADVANCED JAVA PROGRAMMING

Time: 3 hrs Marks:100 marks

ANSWER ANY 5 QUESTIONS (5 X 20 = 100)

1. a. What is the purpose of using break and continue statements? Explain with example.
   b. Write a java program to read two integer values and display their sum using Joption pane class.
   c. Write a Java program to create a mark list of a student using for statement including the inputs- register number, name, marks, total and average

2. a. Write a Java program to print the first n terms of Fibonacci series.
   b. Discuss about the concept of method overloading giving a suitable example
   c. Explain multiple subscripted arrays using a program that performs various matrix operations

3. a. Write a program to read a string and find string length, string reverse and display character array of string.
   b. Discuss the following with examples:
   (i) Event Handling model (ii) JTest field and JPassword field.

4. a. Explain exception handling mechanism with suitable example.
   b. Write a java program to create a pay bill for employees using files

5. a. Explain with example the differences between various features of sets and maps .
   b. Explain the following with suitable example
   (i) Adding Beans to Bean box
   (ii)Connecting Beans with events in the Bean box.

6. a. Describe the various types of scope with a suitable example
   b. What is a package? Discuss the procedure to create a package with an example.
   c. Write swing application to create and display the label containing both icon and string.

7. a. Write an applet to display the following image using the class Graphics:
   (i) Line (ii) 3D Rectangle (iii) Oval
   b. What is a button? Explain its different types with example.
   c. Discuss the benefits of thread synchronization. Illustrate with a program

8. a. How to connect a database into Java application? Explain it with simple application.
   b. How to create a JAR file? Explain the jar command with it's all option in detail with suitable example.

BHARATHIAR UNIVERSITY
MODEL QUESTION PAPER M.SC I.T (SDE)
I YEAR - PAPER III– DISTRIBUTED COMPUTING

Time: 3 hrs Marks:100 marks

ANSWER ANY 5 QUESTIONS (5 X 20 = 100)

1. a. Explain the 3 basic distributed system structures?
   b. Explain the three phases of communication in circuit switching.
   c. Explain any two types of data base distribution.

2. a. Write short notes on throughput. How is it calculated?
   b. List the steps involved in sending e-mail?
   c. Write a note on directory and replication servers.

3. a. Explain four advantages of distributed databases
   b. What are the rules to be followed when refining data fragments?
   c. Explain the steps involved in designing a distributed processing system.

4. a. Explain the issues in using distributed data.
   b. Elaborate on the method of distributing the responsibilities of managing the distributed data among the nodes.
   c. What are the responsibilities and working concepts in file server and printer server? Explain.

5. a. Explain the DAM architecture.
   b. Explain database decision trees
   c. What is ration analysis –Explain.

6. a. Explain the use of data flow systems with a suitable example.
   b. Explain the TM/DM architecture.
   c. Explain client server architecture in detail.

7. a. Explain the Petri net model of the three message protocol.
   b. Discuss the security and integrity problem in a filing system.
   c. Explain the following with examples:
      (i) Features of Distributed Data Bases.(ii) Need for Distributed Data Bases.

8. a. Explain the types of data fragmentation.
   b. Explain the objectives of the design of data distribution.

BHARATHIAR UNIVERSITY
MODEL QUESTION PAPER M.SC I.T (SDE)
I YEAR - PAPER IV **MULTIMEDIA SYSTEMS**

Time: 3 hrs Marks:100 marks

ANSWER ANY 5 QUESTIONS (5 x 20 = 100)

1. a. What is multimedia PC? Discuss its features.
   b. Explain how multimedia techniques are used for cinematic special effects
   c. Elaborate on special hardware required for multimedia application.

2. a. Write down the steps involved in (i) Sizing text (ii) Aligning and centering text
   b. Explain how the brightness and contrast of a picture can be adjusted.
   c. Explain the steps involved in 3D effects

3. a. Describe MIDI protocol
   b. Explain the various predicting techniques
   c. Explain the steps involved in Flip and Rotate

4. a. Discuss the various types of authoring systems.
   b. Explain the teleconferencing systems.
   c. Discuss the principles VR applications

5. a. Describe the concept of hypertext and hyper pictures
   b. Discuss the various video equipments available.
   c. Explain the JPEG image compression standard

6. a. Explain various HTML elements and design paradigms and user interfaces
   b. What is meant by authoring? Describe about text authoring tool
   c. Write about some presentation tools

7. a. You are required to create a web site highlighting your college's profile and record. Explain the various multimedia elements you can incorporate in the site. Sketch the step by step development of such a site.
   b. Compare how multimedia helps the following fields:
      (i) Medical field
      (ii) Education field

8. a. Which are the components required for video data transmission?
   b. Describe multimedia operating system.
   c. b. How Audio and Video Encoding is done in MPEG.

BHARATHIAR UNIVERSITY
MODEL QUESTION PAPER M.SC I.T (SDE)
II YEAR– PAPER V
PROGRAMMING IN C# AND .NET FRAMEWORK

Time: 3 hrs Marks:100 marks

ANSWER ANY 5 QUESTIONS (5 x 20 = 100)

1. a. Explain the fundamental data types in C#.
   b. Explain how classes and methods are declared and called in C#.
   c. Describe the components of .NET framework

2. a. Explain a sealed class and method in C# with suitable example
   b. Explain the various access modifiers in C#.
   c. Explain (i)Web services (ii) windows forms

3. a. Describe the various 'properties' defined in C#
   b. Illustrate implementing Dispose() and destructor using an example.
   c. Explain variables, literals and data types in C#

4. a. Discuss the differences between using keyword class and struct. Give examples.
   b. Write a note on calling constructors from other constructors.
   c. Explain the various branching structures available in C# with suitable examples

5. a .Mention the various format strings used with their descriptions.
   b. Explain single implementation inheritance with an example.
   c. Explain the usage of structures and enumerations in C# with suitable examples

6. a. Bring out the relationship of C# to .NET
   b. Describe the various types of constructors in C#.
   c. Explain the methods that implement arrays using examples

7. a. Explain the looping structures in C# with suitable example statements.
   b. Describe these various operators and their usage in c# - is, sizeof, checked and unchecked, typeof.
   c. Explain the concept of polymorphism as implemented in C#

8. a. Explain the operator overloading concept using suitable example
   b. Explain how a console event can be handled with an appropriate program
   c. Elaborate on error and exception handling in C#.

BHARATHIAR UNIVERSITY
MODEL QUESTION PAPER M.SC I.T (SDE)
II YEAR - PAPER VI
COMPONENT BASED SYSTEMS

Time: 3 hrs Marks:100 marks

ANSWER ANY 5 QUESTIONS (5 x 20 = 100)

1. a. How will you develop a simple Bean application? Explain with an example
   b. How will you create a COM object ? Explain with an Example .
   c.. Explain the basic architecture of DCOM.

2. a. How concurrency is achieved in distributed objects?
   b. Briefly explain the issues involved in query processing .
   c. Explain the models involved in initiating event communication .

3. a. Explain the steps involved in the development of java ORB with an example.
   b. Discuss the methods involved in class factories.
   c. When do we use RMI programming model instead of IDL programming model? Why?

4. a. Write short notes on memory transparency.
   b. Write a note on CORBA naming service.
   c. Discuss the methods to overcome the problems involved in Unreferenced objects.

5. a. List the steps involved in creating a DLL server with ATL.
   b. Briefly explain how remote object can be invoked.
   c. Describe how transaction is managed in Object DBMS.

6. a. Explain the features of Distributed Object Databases
   b. Describe the DOM architectures
   c. Discuss CORBA services

7. a. Discuss the issues involved in CORBA object model in detail
   b. Write a CORBA client application to say “hello” and explain how an ORB object is created and accessed to invoke the specified operation in your coding.

8. a. Explain the overview of CORBA architecture with its Implementation Issues
   b. Write notes on (i) marshalling
   (ii) reference counting
   (iii) object clustering
   (iv) factory components
   (v) ActiveX control

BHARATHIAR UNIVERSITY
MODEL QUESTION PAPER M.SC I.T (SDE)
II YEAR – PAPER VII
WEB SERVICES

Time: 3 hrs Marks:100 marks

ANSWER ANY 5 QUESTIONS (5 x 20 = 100)

1. a. Explain the applications that utilize web services.
   b. Explain the signing of XML document using XML encryption.
   c. Write an note on remote web services. How are they useful?

2. a. Explain the exchange of information between applications in a distributed environment?
   b. Compare J2EE and .NET framework in the context of web services.
   c. Write a program to illustrate web service in .NET environment.

3. a. Explain the terms latency, reliability and QOS metric.
   b. Write a complete set of programs to illustrate SOAP message passing.
   c. Explain the SOAP message structure and illustrate SOAP with attachment.

4. a. Create a DTD for mark statement of a student. Write a program to retrieve the elements and attributes of the XML document and display the mark statement.
   b. Write a note on key issues in mobile and wireless web services.
   c. Write an XML document to illustrate the elements, attributes and CDATA section.

5. a. Explain the web service protocol stack.
   b. Explain the UDDI specifications .
   c. What are the common threats to the security in web services? Explain.

6. a. What is the role of XML in e-commerce applications? Discuss in detail.
   b. What are the methods adopted to overcome security attacks in web services?
   c. Explain how seamless porting to multiple platforms achieved in web services.

7. a. Explain the customization and maintenance aspects in web service applications
   b. Why is XML a popular choice for web services. What are the other options for developing web services?
   c. What are system interfaces in web services? Discuss their implementation aspects.

8. a. Explain XML security framework.
   b. Explain how static and dynamic system interfaces can be implemented.
   c. Write an XML document to illustrate XSL, parameter entities.