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06CS71

Seventh Semester B.E. Degree Examination, December 2010
Object Oriented Modeling and Design

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. What is object orientation? Explain briefly the stages involved in OO methodology. (10 Marks)
- b. Use illustrations and explain the following with UML notations:
 - i) Ordering the objects for an association end
 - ii) A multilevel inheritance hierarchy with instances. (10 Marks)
- 2 a. What is an event? Explain various kinds of events, using UML notations. (10 Marks)
- b. A simple digital watch has a display and two buttons, A and B to set it. The watch has two modes of operation, display time and set time. In the display time mode, the watch display hours and minutes, separated by a flashing colon. The set time mode has two sub modes, set hours and set minutes. The A button selects modes. Each time it is pressed, the mode advances in the sequence : display, set hours, set minutes, display etc. Within the submode, the B button advances the hours or minutes once each time it is pressed. Buttons must be released before they can generate another event. Prepare a state diagram of the watch. (10 Marks)
- 3 a. What is a nested state? Illustrate the importance and usage of aggregation concurrency, with the help of a state diagram. (10 Marks)
- b. Consider shopping in a physical bookstore of super market :
 - i) List three actors that are involved in the design of a checkout system. Explain the relevance of each actor.
 - ii) Take the perspective of a customer and list two use cases. Summarize the purpose of each use case within a sentence.
 - iii) Prepare a use case diagram for physical bookstore checkout system.
 - iv) Prepare a normal scenario for each use case. (10 Marks)
- 4 a. Explain the following development life cycle for software using OO approach:
 - i) Waterfall development
 - ii) Iterative development. (10 Marks)
- b. How are classes identified in a domain class model? Briefly explain. (04 Marks)
- c. For an ATM bank system, prepare a data dictionary for all modeling elements. (06 Marks)

PART – B

- 5 a. For an ATM system, prepare a normal scenario for process transaction and also give a sequence diagram for the process transaction scenario. (10 Marks)
- b. Name the three kinds of control for the external events in a software system. Also describe each control very briefly. (10 Marks)
- 6 a. What tasks are involved in the process of design optimization? Explain any one in detail. (10 Marks)
- b. Clearly distinguish between forward engineering and reverse engineering. (06 Marks)
- c. Write briefly on association traversal. (04 Marks)
- 7 a. What is a pattern? How is it categorised? Describe any one category, with an example. (10 Marks)
- b. Briefly discuss the structure of the client-dispatcher-server design pattern using CRC. (10 Marks)
- 8 a. Give an example design pattern for management of software system and explain briefly. (10 Marks)
- b. What are Idioms? How do they differ from design patterns? Explain the necessary steps for implementing the counted pointer Idiom. (10 Marks)

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Seventh Semester B.E. Degree Examination, December 2010
Programming the Web

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

1.
 - a. How does domain name conversion happens on the web? Describe the concept, with a figure, by taking a suitable example. (06 Marks)
 - b. Give and explain the request and response phases of hyper text transfer protocol. (08 Marks)
 - c. What is the purpose of a MIME type specification in request/response transactions between a browser and a server? (03 Marks)
 - d. Give and explain the syntax of the following tags:
 - i) <blockquote >
 - ii) <meta >
 (03 Marks)

2.
 - a. Create, test and validate a XHTML document that has a form with
 - (I) Three text boxes to collect user name and address.
 - (II) Table with the headings product name, price and quantity and the values are
 - i) 100 – watts light bulb, \$ 2.39, 4
 - ii) 200 – watts light bulb, \$ 4.29, 8
 - iii) 100 – watts long life light bulbs, \$3.95, 4
 - iv) 200 – watts long life light bulbs, \$ 7.49, 8
 - (III) A collection of 4 radio buttons that are labeled as
 - i) Visa
 - ii) Master card
 - iii) Discover
 - iv) Check
 - (IV) A submit and a reset button. (10 Marks)
 - b. Explain the syntactic differences between HTML and XHTML. (05 Marks)
 - c. Create XHTML document that has two frames. The left frame displays contents.html and the right frame displays cars.html where the second frame is a target of link from the first frame. [Note : contents.html is a list of links to the cars description.] (05 Marks)

3.
 - a. What are the selector forms? Explain with example, different types of selector forms, with syntax. (06 Marks)
 - b. How many levels of style sheet are there? Explain their usage, with syntax and example. (06 Marks)
 - c. Write document level style sheet to illustrate the text-decoration. (04 Marks)
 - d. Write the conflict resolution in cascading style sheets. (04 Marks)

4.
 - a. Explain with examples, the screen output and keyboard input methods. (05 Marks)
 - b. Write a javascript to accept three numbers, using the prompt method. Find and display the largest of three using alert method. Use predefined function Math.max. (05 Marks)
 - c. Write a javascript that contains a function named tst_phone_num, which tests the phone number of the format ddd-dddd-dddddd <091-8256-1234567> and display whether the given number is valid or not using alert. (05 Marks)
 - d. Write a note on character and character classes. (05 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – B

- 5 a. What are the different approaches to addressing XHTML elements? Describe with examples. (06 Marks)
- b. Explain the three phases of event processing in the DOM2 event model. (06 Marks)
- c. Write a javascript to compare two passwords. (08 Marks)
- 6 a. Explain the different types of positioning, with examples. (06 Marks)
- b. Write a javascript that illustrates the dynamic stacking of images. (06 Marks)
- c. Write a javascript which displays the message 'Hello, how are you?' when the mouse button is pressed no matter where it is on the screen. (06 Marks)
- d. What exactly is stored in the screen X and screen Y properties after a mouse click?(02 Marks)
- 7 a. What is the document type definition (DTD)? Describe the approach to declare elements, entities and attributes. (08 Marks)
- b. Create an XML document that lists advertisement for selling used cars. (06 Marks)
- c. With a neat diagram, explain the transformation process by an XSLT processor. (06 Marks)
- 8 a. Describe with examples, the various types of variables, in PERL. (06 Marks)
- b. Write a PERL program to read a file on command line that contains person's name, in each line, converts them to uppercase and displays them in ascending order. (04 Marks)
- c. Write a CGI-PERL program to use a cookie to remember the day of the last login, from a user and display it when executed. (06 Marks)
- d. Write a note on CGI-Pm module. (04 Marks)

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Seventh Semester B.E. Degree Examination, December 2010
Embedded Computing Systems

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. What do you mean by system on chip (SOC)? With a neat block diagram, explain an embedded SOC in a mobile phone. (07 Marks)
- b. Define design metrics in an embedded system. What are the different competing design metrics? What are the challenges faced in designing an embedded system? (10 Marks)
- c. What is the role of ROM and RAM in an embedded system? (03 Marks)
- 2 a. Compare the advantages and disadvantages of data transfer, using serial and parallel ports/devices. (04 Marks)
- b. Explain three modes of serial communication using serial devices, with one example each. (08 Marks)
- c. Describe : i) UART ii) RS232C iii) SDIO (08 Marks)
- 3 a. Explain : i) Software timer ii) Watchdog timer iii) RTC (08 Marks)
- b. Explain the use of each control bit in I²C bus protocol. (05 Marks)
- c. Mention various wireless and mobile system protocols. Explain any two of them. (07 Marks)
- 4 a. Explain context switching, interrupt latency and interrupt service deadline. (10 Marks)
- b. How do the device driver functions and ISR functions differ? Explain. (05 Marks)
- c. What do you mean by throwing an exception? Explain. (05 Marks)

PART – B

- 5 a. What are the different programming models? With an example, explain the FSM model. (08 Marks)
- b. Explain the modeling of a multi processor system. (07 Marks)
- c. Define process and tasks. Explain the tasks with their states. (05 Marks)
- 6 a. Explain how processes are created and managed. (06 Marks)
- b. "Memory allocation and management are the most important functions of Kernel". Why? Explain the memory mapping strategy. (08 Marks)
- c. What is the importance of device management in an OS for an embedded system? (06 Marks)
- 7 a. What is RTOS? Explain the basic design of embedded system using RTOS. (06 Marks)
- b. Mention the various scheduling models. Explain the preemptive scheduling model. (10 Marks)
- c. What should be the OS security policy? Explain various important security functions. (04 Marks)
- 8 a. What is a target system? How is embedded software loaded into the target system? (06 Marks)
- b. Explain : i) Simulators ii) ICE. (10 Marks)
- c. Why do we use an host system for most of the developments? What are the testing steps at host machine? (04 Marks)

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Seventh Semester B.E. Degree Examination, December 2010
Software Architecture

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.**

PART – A

- 1 a. Explain how the software architectures affect the factors of influence. Hence or otherwise explain ABC. (08 Marks)
- b. Briefly explain the technical importance of software architectures. Further elaborate on the fact that architecture is the vehicle for stakeholder communication. (07 Marks)
- c. What is an allocation structure as applied to software architectures? Explain the three allocation structures in practice. (05 Marks)
- 2 a. Define the following, with an example :
i) Controlled variable ; ii) Set point ; iii) Open loop system ; iv) Feedback control system ; v) Feed forward control system. (10 Marks)
- b. State the problem of KWIC. Propose implicit invocation and pipes and filters style to implement a solution for the same. (10 Marks)
- 3 a. What is a quality attribute scenario? List the parts of such a scenario. Distinguish between availability scenarios and modifiability scenarios. (08 Marks)
- b. Explain how faults are detected and prevented. (08 Marks)
- c. Write a brief note on design time tactics. (04 Marks)
- 4 a. List the components of a pipe and filters architectural pattern. With sketches, explain the CRC cards for the same. (08 Marks)
- b. Explain the forces that influence the solutions to problems based on blackboard pattern. (07 Marks)
- c. Write a note on the HEARSAY – II system. (05 Marks)

PART – B

- 5 a. What is the necessity of proxies and bridge components in a broker system? Explain. (06 Marks)
- b. Explain the possible dynamic behaviour of MVC pattern, with suitable sketches. (09 Marks)
- c. Highlight the limitations of PAC pattern. (05 Marks)
- 6 a. List and explain the participating components of a microkernel pattern. (10 Marks)
- b. Explain the known uses of reflection pattern. (10 Marks)
- 7 a. Briefly explain the benefits of master slave design pattern. (06 Marks)
- b. List and explain the steps to implement a whole – part structure. (08 Marks)
- c. With a neat sketch, explain the typical dynamic scenario of a proxy structure. (06 Marks)
- 8 a. List the steps of ADD. (04 Marks)
- b. Write a note on creating a skeletal system. (06 Marks)
- c. What are the uses of architectural documentation? Bring out the concept of view as applied to architectural documentation. (10 Marks)

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06IS74

Seventh Semester B.E. Degree Examination, December 2010
Data Mining

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting atleast TWO questions from Part – A and Part – B.

PART – A

1. a. What is data mining? Explain the challenges that motivated the development of data mining. (10 Marks)
- b. Explain the different types of data sets with examples. (10 Marks)
2. a. Describe the various approaches for feature selection. (06 Marks)
- b. Explain with examples the following : i) Simple matching coefficient ii) Jacquard coefficient iii) Cosine similarity. (06 Marks)
- c. Discuss the measures of proximity between objects that involve multiple attributes. (08 Marks)
3. a. What is classification? Explain the two classification models with example. (06 Marks)
- b. Consider the training examples, shown in table Q3(b) for a binary classification problem.
 - i) What is the entropy of this collection of training examples with respect to the positive class?
 - ii) What are the information gains of a_1 and a_2 relative to these training examples? (08 Marks)

Table Q3(b)

Instance	a_1	a_2	a_3	Target class
1	T	T	1.0	+
2	T	T	6.0	+
3	T	F	5.0	-
4	F	F	4.0	+
5	F	T	7.0	-
6	F	T	3.0	-
7	F	F	8.0	-
8	T	F	7.0	+
9	F	T	5.0	-

- c. Distinguish between Rule based ordering scheme and class based ordering scheme. (06 Marks)
4. a. A data base has four transactions. Let $\text{min_Sup} = 40\%$ and $\text{min_conf} = 60\%$.

TID	DATE	ITEMS BOUGHT
100	01.01.01	{K, A, D, B}
200	01.01.10	{D, A, C, E, B}
300	01.15.10	{C, A, B, E}
400	01.22.10	{B, A, D}

Find all frequent item sets, using Apriori and FP growth algorithms. Compare the efficiency of the two meaning processes. (10 Marks)

- b. Explain various alternative methods for generating frequent item sets. (10 Marks)

PART – B

- 5 a. What is Apriori algorithm? Give an example.
A Data base has six transactions of purchase of books from a book shop as given below.
 $t_1 = \{ANN, CC, TC, CG\}$, $t_2 = \{CC, D, CG\}$
 $t_3 = \{ANN, D, CC, TC\}$, $t_4 = \{ANN, CC, D, CG\}$
 $t_5 = \{ANN, CC, D, TC, CG\}$, $t_6 = \{C, D, TC\}$
Let $X = \{CC, TC\}$ and $Y = \{ANN, TC, CC\}$. Find the confidence and support of the Association rule $X \rightarrow Y$ and inverse rule $Y \rightarrow X$. (10 Marks)
- b. Explain the various properties of objective measures. (10 Marks)
- 6 a. What is cluster analysis? Explain different types of clusters. (10 Marks)
- b. Explain the hierarchical clustering, with example. (06 Marks)
- c. Explain DBSCAN algorithm. (04 Marks)
- 7 a. Discuss the use of data mining application for telecom industry (10 Marks)
- b. What are the trends in data mining? (10 Marks)
- 8 Write short notes on :
- a. K – means algorithm.
- b. Outlier analysis.
- c. Spatial data mining.
- d. Social impact of data mining. (20 Marks)

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Seventh Semester B.E. Degree Examination, December 2010

C# Programming and .Net

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. What are the building blocks of .Net frame work? Show their relationship, with a neat block diagram. Explain CTS, in detail. (10 Marks)
- b. What is .Net assembly? What does it contain? Explain each of them. (10 Marks)
- 2 a. Explain with a neat diagram, the workflow that takes place between your source code, a given .Net compiler and the .Net execution engine. (10 Marks)
- b. What is cordbg.exe? List and explain any five command line flags recognized by cordbg.exe while running .Net assemblies under debug mode. (07 Marks)
- c. What is csc.rsp file? Where is it located? (03 Marks)
- 3 a. Why System .Object is called master node? List and explain any three instance methods and static methods of System .Object. (10 Marks)
- b. What are the method parameter modifiers? Explain any two C# method parameter modifiers, with an example. (05 Marks)
- c. With an illustrative example, explain what happens when reference type is passed by value and when reference type is passed by reference. (05 Marks)
- 4 a. What are the three pillars of object oriented programming in C#? Differentiate between "is-a" and "has-a" relationships. (05 Marks)
- b. What is a property in C#? Why is it used? What is the advantage of using property over traditional accessor and mutator methods? (05 Marks)
- c. Define a person class with three data members : age, name and sex.
 - Create appropriate constructor.
 - Derive a class called employee from person that adds a data member code to store employee code.
 - Derive another class called specialist from employee.
 - Add a method to each of the derived class to display information about what it is.

Write a driver program to generate an array of three ordinary employees and another array of three specialist and display information about them. Also display the information of the specialist by calling the method inherited from employee class. (10 Marks)

PART – B

- 5 a. List and explain with code, the core members of system. Exception type. (10 Marks)
- b. Define a method that would sort an array of integers. Incorporate exception handling mechanism for "index out of bounds" situation. Develop a main program that employs this method to sort a given set of integers. (10 Marks)

- 6 a. What is an interface? Why they are used in C# programming? With an example, explain any four interfaces of System . Collection. (10 Marks)
- b. Write a C# program which contains the following:
- An interface called dimension with the methods length () and width (), which returns length and width in centimeters.
 - Another interface called metric dimension with the methods lengthinches () and widthinches (), which returns length and width in inches.
 - A class box that implements both the above said interfaces. This class has two data members lengthinches and widthinches.
- Define appropriate constructor for the class box. Write a main program to create an instance of box and to display the box length and width in inches and centimeters by invoking the appropriate methods of two interfaces. (10 Marks)
- 7 a. What is a delegate? Differentiate between synchronous and asynchronous delegate, with examples. (10 Marks)
- b. Write a complete C# program to calculate and display simple interest by writing appropriate methods which could be called through delegate method of programming. (10 Marks)
- 8 a. Explain the two conceptual views of .Net assembly with a neat diagram. What are the core benefits of this? (10 Marks)
- b. Write short notes on the following:
- i) Classic COM binaries versus .Net assemblies
 - ii) Cross language inheritance. (10 Marks)

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06CS/IS753

Seventh Semester B.E. Degree Examination, December 2010

JAVA and J2EE

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART – A

1.
 - a. Briefly explain any six key considerations used for designing JAVA language. (06 Marks)
 - b. Discuss three OOP principles. (06 Marks)
 - c. How “compile once and run anywhere” is implemented in JAVA language? (04 Marks)
 - d. List down various operators available in JAVA language. (04 Marks)

2.
 - a. Differentiate C++ language and JAVA language with respect to inheritance, and also mention the use of super and this in JAVA inheritance. (06 Marks)
 - b. Discuss the following :
 - i) Inner classes
 - ii) Overriding and overloading. (04 Marks)
 - c. Briefly explain the role of interfaces while implementing multiple inheritance in JAVA. (04 Marks)
 - d. Write a JAVA applet which continuously plays an audio clip named “anthem.wav” loaded from applets parent directory. Provide the necessary HTML file to run this applet. (06 Marks)

3.
 - a. What are threads? Provide any two typical applications where multithreaded programming is used. (04 Marks)
 - b. Provide JAVA syntax for the following with examples:
 - i) Making classes threadable
 - ii) Extending threads
 - iii) Synchronization
 - iv) Catching interrupt. (04 Marks)
 - c. Write a JAVA program, which creates two threads, one thread displays “VTU – Belgaum” for every 100 seconds, and another thread displays “Karnataka” for every 50 seconds, continuously. (06 Marks)
 - d. Define the delegation event model. Briefly explain the role of :
 - i) Event classes
 - ii) Event listener interfaces
 - iii) Source of events
 - iv) Adapter clauses. (06 Marks)

4.
 - a. What are swings? Provide any two typical applications of swings. (04 Marks)
 - b. Explain various components of the swing package. (06 Marks)
 - c. Write a JAVA swing applet, which accepts a text from a J text field, and displays the same text with selected font size and font color using J label. (06 Marks)
 - d. Write the purpose of the following swing components :
 - i) JLabel
 - ii) JTabbedPane
 - iii) JScrollbar
 - iv) JComboBox (04 Marks)

PART – B

5.
 - a. Explain the working of JDBC. (02 Marks)
 - b. What are database drivers? Mention different types of drivers used in JDBC. (04 Marks)

- 5 c. Provide various classes, interfaces and exceptions available under JAVA sql package, along with their purpose. (08 Marks)
- d. Give the JAVA syntax for the following :
- Connecting to a database using JDBC/ODBC bridge, which has url = "jdbc : odbc : SDB", Username = "scott" and password = "tiger".
 - Running a query "select emp-age from emp" over that connected database.
 - Counting number of employees, with the condition emp – age > 50. (06 Marks)
- 6 a. What are servlets? Briefly explain the application of servlets in web programming. (04 Marks)
- b. Explain the life cycle of a servlet. (04 Marks)
- c. Write a JAVA servlets which reads two parameters from the webpage, say, value 1 and value 2, which are of type integers, and finds the sum of the two values, and return back the result as a webpage. (06 Marks)
- d. Provide JAVA syntax for the following :
- Handling HTTP requests and responses
 - Using cookies
 - Session tracking. (06 Marks)
- 7 a. Mention the purpose of use of JSP and JAVA RMI. (04 Marks)
- b. Explain any four JSP tags. (04 Marks)
- c. Briefly explain the working of JAVA RMI programs, by mentioning its steps. (06 Marks)
- d. What are the differences between server side and client side JAVA RMI? (06 Marks)
- 8 a. Briefly explain various enterprise-level requirements which are addressed using enterprise JAVA beans technology. (06 Marks)
- b. Explain the differences between session beans and entity beans. (06 Marks)
- c. Mention the applications of a JAR file and deployments descriptors. (04 Marks)
- d. Provide a JAVA bean class to store customer information, which includes fields like address, name and credit card details. Also include methods to retrieve values from the class about the above mentioned fields. (04 Marks)

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06IS765

Seventh Semester B.E. Degree Examination, December 2010
User Interface Design

Time: 3 hrs.

Max. Marks:100

*Note: Answer any FIVE full questions, selecting
at least TWO questions from each part.*

PART – A

- 1 a. What are the goals of user interface design? Mention the associated measurable human factor. (08 Marks)
- b. Briefly explain how motivation for human factor is designed for
i) User with disabilities ; ii) Elderly users. (08 Marks)
- c. List the stages of action models. (04 Marks)
- 2 a. What are three principles under human factors of interactive software? Explain the first principle. (10 Marks)
- b. With a neat diagram, explain the three pillars of user interface design. (10 Marks)
- 3 a. Briefly explain variety of expert – review methods. (08 Marks)
- b. List the features of user – interface tools. (04 Marks)
- c. What are direct manipulation systems? Mention its drawback. Briefly explain the OAI model of direct manipulation. (08 Marks)
- 4 a. What are the different ways to represent menu systems? Brief each of them. (08 Marks)
- b. Briefly explain the fast movement through menus. (06 Marks)
- c. Enumerate the guidelines for form Fillin design. (06 Marks)

PART – B

- 5 a. Explain the different strategies for command organization. (07 Marks)
- b. Briefly explain the benefits of structure. (05 Marks)
- c. Explain with suitable examples, different pointing devices. (08 Marks)
- 6 a. Briefly explain : i) Speech store and forward ; ii) Speech generation. (06 Marks)
- b. What are different display technologies? Brief them. List the features of VDU. (10 Marks)
- c. Define Response time and display rate. (04 Marks)
- 7 a. What are guidelines to be followed when constructing error messages? Brief each, with suitable examples. (08 Marks)
- b. List the guidelines that highlight the potential benefits and dangers of using color coding. (08 Marks)
- c. Compare and contrast the reading from paper from display. (04 Marks)
- 8 a. Briefly explain on-line facilities. (05 Marks)
- b. Explain the coordinated window using tight coupling among windows. (10 Marks)
- c. Write notes on OAI model, for web design. (05 Marks)

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