

Seventh Semester B.E. Degree Examination, December 2011
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 a model? Give an example. What purpose does it serve? Explain (08 Marks)
- b. What are the link and association? Write and explain UML notation for links and association, with an example. (08 Marks)
- c. Explain qualified association, with an example. (04 Marks)
- 2 a. What is aggregation and composition? Give their respective UML notations, with an example. (10 Marks)
- b. What is an event? Explain different types of events, with an example. (10 Marks)
- 3 a. Draw the use – case diagram, for vending machine. What are the guidelines needed to be followed while drawing use–case models. (10 Marks)
- b. Explain activity diagram, with the UML notation. Give an example. (05 Marks)
- c. Mention the guidelines for activity models. (05 Marks)
- 4 a. What is software development process? Explain the stages of software development process. (10 Marks)
- b. Write and explain the steps performed in constructing a domain state model, with an example. (10 Marks)

PART – B

- 5 a. With a neat block diagram, explain the steps followed in constructing application class model. (10 Marks)
- b. Describe the architecture of an ATM system, with the help of a neat block diagram. (10 Marks)
- 6 a. Explain the different tasks involved in design optimization. (10 Marks)
- b. Write short notes on:
 - i) Reverse engineering Vs forward engineering
 - ii) Wrapping. (10 Marks)
- 7 a. Describe the three categories of pattern. (10 Marks)
- b. With a neat diagram, explain the dynamics of client: Dispatcher server design pattern. (10 Marks)
- 8 a. Define forward receiver design pattern. (02 Marks)
- b. Write and explain the steps to implement a forward receiver design pattern. (10 Marks)
- c. Write the steps to implement the counted pointer idiom. (08 Marks)

Seventh Semester B.E. Degree Examination, December 2011

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. Describe fully qualified domain name and explain how fully qualified domain names are translated into IP. (06 Marks)
 - b. What is HTTP? Explain its phases in detail. (10 Marks)
 - c. Explain the following tags with examples: i) ii) <a> (04 Marks)

- 2
 - a. Bring out the differences between HTML and XHTML. (06 Marks)
 - b. Write an XHTML program to create a link within a document. (04 Marks)
 - c. Create XHTML document that defines a table with five rows and five columns. The first row should contain country name, gold, silver, bronze (all three indicating the type of medals) and total in each column respectively. Fill in the information details in the table with appropriate values. After filling the details set red color to the background for the first row, blue for the second, yellow for the third, purple for the fourth and green for the fifth row. Use of align and valign attributes for this table has to be made at the appropriate places. (10 Marks)

- 3
 - a. List out the variety of selector forms available in CSS and explain in detail. (08 Marks)
 - b. Explain the different levels of style sheets available in CSS. (04 Marks)
 - c. Explain the box model (margin and padding property) with respect to CSS. (08 Marks)

- 4
 - a. Explain different primitive types in java script. (05 Marks)
 - b. Explain the concept of object creation and modification in javascript. (05 Marks)
 - c. Develop and demonstrate, the use of javascript, a XHTML document that illustrates the USN (the valid format is: A digit 1 to 4 followed by two uppercase characters followed by two digits followed by two uppercase characters followed by three digits {these three digits should not be all zero's} no embedded spaces allowed) of the user. Event handler must be included for the form element that collects this information to validate the input. Messages in the alert windows must be produced when errors are detected. (10 Marks)

PART – B

- 5
 - a. Write XHTML and javascript, script which has six buttons, labeled six different subjects. The event handler for these buttons must produce message starting the chosen favorite subject. The event handler must be implemented as a function, whose name must be assigned to the onclick attribute of the radio button element. The chosen subject must be sent to the event handler as a parameter. Use a click event to trigger a call to alert, which should display a brief description of the selected subject. (10 Marks)
 - b. Write XHTML and javascript, script that checks the passwords, that includes two passwords as input elements, along with reset and submit buttons. Implement the below mentioned functions to check:
 - i) Both entered passwords are same.
 - ii) Both entered passwords are different.
 - iii) If no password is typed in either of the password fields.
 Use on submit event to trigger a call to display an alert box if the error occurs. (07 Marks)
 - c. Explain all parameters of add Event Listener method. (03 Marks)

- 6 a. Explain different types of positioning elements with example. (10 Marks)
b. Write XHTML and javascript, script that illustrate the DOM2 event model which allows the user to drag and drop words to complete a paragraph (create atleast 10 words). Use both DOM0 and DOM2 event model concept. (10 Marks)
- 7 a. What is DTD? Explain how to create elements, attributes and entities in DTD. (10 Marks)
b. Explain the concept of XSLT processing. (04 Marks)
c. With an example, explain how an XSLT processor uses an XSLT style sheet with an XML document. (06 Marks)
- 8 a. What are the three categories of perl variables? Give an example for each. (06 Marks)
b. What is CGI? How can data be passed in CGI using GET and POST methods, with example? (10 Marks)
c. Explain remembering matches in perl. (04 Marks)

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SKIT LIBRARY

Seventh Semester B.E. Degree Examination, December 2011
Embedded Computing Systems

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. What is an embedded system? With the aid of a neat functional schematic, explain the components of an embedded system. Also indicate the important characteristics and constraints of the embedded system. (10 Marks)
- b. Write down any ten important software tools, used for designing an embedded system, specifying their applications. (10 Marks)
- 2 a. Briefly explain the three classes of embedded systems. Further, discuss the skills required for an embedded system designer. (10 Marks)
- b. A device port may have multibyte data input buffer(s) and data output buffer(s). What are the advantages of these? Also explain the characteristics that are taken into consideration when interfacing a device port in a system. (10 Marks)
- 3 a. With the aid of a functional diagram, describe how an internet –enabled embedded system is communicating to other systems on the internet. Explain the advantages of internet –enabled systems. (10 Marks)
- b. What do you mean by plug and play devices? What are the bus protocols of buses UART, RS232C, USB, Bluetooth, CAN and PCI that support plug and play devices? Briefly explain. (10 Marks)
- 4 a. Define context, interrupt latency and interrupt service deadline. Why is the context switching in an embedded processor faster than saving the pointers and variables on the stack using a stack pointer? How does the context switching time reduces in processor architectures for embedded systems? Explain. (10 Marks)
- b. With illustrative examples, explain the uses of the following in an interrupt –service mechanism
i) Hardwave – assigned priorities ii) Softwave – assigned priorities. (10 Marks)

PART – B

- 5 a. Why does the program complexity increases with a reduced number of DFGs and increasing decision nodes? Explain. (04 Marks)
- b. How will you schedule the following instructions, on two processors?
i) SIMD ii) MIMD iii) VLIW. (06 Marks)
- c. Briefly discuss the important characteristics of the functions, interrupt service routines (ISRs) and tasks, that are used in an embedded software. (10 Marks)
- 6 a. Explain any five RTOS timer functions and the action taken on calling these functions. (10 Marks)
- b. Discuss the three approaches, used for interrupt routines in RTOS environment and handling of interrupt source calls. (10 Marks)

- 7 a. In brief, discuss the important design principles to be considered, when using an RTOS to design an embedded system. (10 Marks)
- b. Show the use of semaphores for synchronising the tasks as co-operative scheduled tasks in preemptive RTOS. Also show the use of semaphores and times functions for synchronizing the tasks as round robin time – sliced scheduled tasks in a preemptive RTOS. (10 Marks)
- 8 a. What is a target system? How does the target system differ from the final embedded system? What do you mean by application software for a target system? Briefly discuss. (06 Marks)
- b. Why is system performance index defined as the ability to meet required functions and specifications while using the minimum amount resources of memory, power dissipation and devices and minimum design efforts and optimum utilization of each resource? (06 Marks)
- c. What is a simulator? With the aid of a neat block schematic, explain the detailed design development process using the simulator. (08 Marks)

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Seventh Semester B.E. Degree Examination, December 2011
Software Architectures

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Define the software architecture. Discuss in detail, the implications of the definition. (10 Marks)
- b. Define the following terms :
 - i) Architectural model
 - ii) Reference model
 - iii) Reference architecture. (06 Marks)
- c. Explain the module based structures. (04 Marks)
- 2 a. Discuss the invariants, advantages and disadvantages of pipes and filters architectural style. (09 Marks)
- b. What are the basic requirements for a mobile robot's architecture? How the implicit invocation model handles them? (08 Marks)
- c. Write a note on heterogeneous architectures. (03 Marks)
- 3 a. What are the qualities that the architecture itself should possess? (06 Marks)
- b. List the parts of quality attribute scenario. (04 Marks)
- c. What is the goal of tactics for testability? Discuss the two categories of tactics for testing. (10 Marks)
- 4 a. Discuss the steps involved in the implementation of pipes of filters architecture. (12 Marks)
- b. Write the context, problem and solution part of blackboard architectural pattern. (08 Marks)

PART – B

- 5 a. Discuss the most relevant scenario, illustrating the dynamic behavior of a broker system. (10 Marks)
- b. Discuss the consequences of presentation abstraction control architectural pattern. (10 Marks)
- 6 a. Explain in brief, the components comprising the structure of microkernel architectural pattern. (10 Marks)
- b. With an example, explain when the reflection architectural pattern is used. What are its benefits? (10 Marks)
- 7 a. Explain the variants of whole – part design pattern, in brief. (10 Marks)
- b. Explain the dynamics part of master – slave design pattern. (08 Marks)
- c. Mention any two benefits of proxy design pattern. (02 Marks)
- 8 a. Explain the steps involved in designing an architecture, using the attribute driven design. (10 Marks)
- b. "Architecture serves as a communication vehicle among stakeholders. Documentation facilitates that communication" Justify. (10 Marks)

Seventh Semester B.E. Degree Examination, December 2011

Data Mining

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 challenges in methodology of data mining technology? (08 Marks)
 - b. What defines a data mining task? Explain at least five primitives. (07 Marks)
 - c. Distinguish between categorical and numerical attributes. (05 Marks)
2.
 - a. What is Euclidian distance? Write the generalized Minkowski distance metric for different values of r. (08 Marks)
 - b. Explain the similarity and dissimilarity between two objects. (04 Marks)
 - c. What are the issues related to proximity measures? (08 Marks)
3.
 - a. Explain hunts algorithm for the inducing decision trees. (08 Marks)
 - b. What are the various characteristics of the decision tree induction? (07 Marks)
 - c. Explain the characteristics of nearest neighbor classifiers. (05 Marks)
4.
 - a. Develop the Apriori algorithm for the generating frequent itemset generation. (08 Marks)
 - b. Consider the transaction data set for an super market:

Tid	1	2	3	4	5	6	7	8	9
List of item-ids	I1, I2, I5	I2, I4	I2, I3	I1, I2, I4	I1, I3	I2, I3	I1, I3	I1, I2, I3, I5	I1, I2, I3

Generate all the frequent itemsets. Also generate all the association rules by considering minimum confidence threshold 70% and minimum support thruhold 20%. (12 Marks)

PART – B

5.
 - a. Apply Fp-growth algorithm to generate frequent itemset for the figure 1 transaction data set. (08 Marks)
 - b. Write an algorithm to construct conditional Fp-tree, with an example. (07 Marks)
 - c. Write short notes on sequential pattern discovery. (05 Marks)
6.
 - a. What is cluster analysis? What are the different types of clusters? (08 Marks)
 - b. Explain the bisecting K-means algorithm to the generate clusters. (07 Marks)
 - c. Compare K-means, with the DBSCAN algorithm. (05 Marks)
7.
 - a. Explain the different dimensions in a spatial data mining. (08 Marks)
 - b. Explain the different text mining approaches. (07 Marks)
 - c. Explain the need for mining the world wide web. (05 Marks)
8.

Write short notes on:

 - a. Statistical data mining
 - b. Multimedia data mining
 - c. Trends in data mining
 - d. Data mining applications. (20 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.

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Seventh Semester B.E. Degree Examination, December 2011
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 is meant by a consistent user interface? Explain the five measurable human factors to evaluate user interface. (06 Marks)
- b. List and explain the goals of system engineering in the user interface design. (06 Marks)
- c. Explain the eight golden rules of the user interface designing. (08 Marks)
- 2 a. What are the high level theories needed to describe the multiple aspects of interactive systems? (08 Marks)
- b. Describe the three pillars of design. (08 Marks)
- c. Design 'ethnographic observation' for the user interface design. (04 Marks)
- 3 a. Explain the different variety of expert review methods. (05 Marks)
- b. Briefly explain the features of user-interface building tools. (08 Marks)
- c. What is meant by direct manipulation systems? Explain three examples of it. (07 Marks)
- 4 a. State the importance of 'visual thinking and icons'. (04 Marks)
- b. Briefly explain the task-related organization of menu-structure design, with an example. (10 Marks)
- c. List and explain the guidelines for menu selection. (06 Marks)

PART – B

- 5 a. Briefly explain the strategies and guidelines for using the abbreviations. (08 Marks)
- b. What kinds of task pointing devices are applicable? Explain the indirect control pointing devices. (08 Marks)
- c. Briefly explain the important features of visual display units. (04 Marks)
- 6 a. What are the error message guidelines for end product and for the development process? (10 Marks)
- b. What different guidelines must be considered while writing user manual. (10 Marks)
- 7 a. Briefly explain the multiple window design concept. (10 Marks)
- b. Explain the image browsing by tightly-coupled windows. (10 Marks)
- 8 Write short notes on the following :
 - a. Object action interface model for web site design
 - b. Legal issues of user interface
 - c. Evaluation during active use
 - d. Speech recognition. (20 Marks)

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Seventh Semester B.E. Degree Examination, December 2011
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. List and explain the features of Java. (10 Marks)
- b. Explain the process of building and running a java application program. (05 Marks)
- c. Explain the following : (05 Marks)
 - i) JVM
 - ii) Type casting.
- 2 a. Define exception. Demonstrate the working of nested try blocks, with suitable examples. (08 Marks)
- b. What are applets? Explain the different stages in the life cycle of an applet. (08 Marks)
- c. Write short notes on: (04 Marks)
 - i) Final class
 - ii) Abstract class.
- 3 a. What is multithreading? Explain any two advantages of multithreaded programs. (04 Marks)
- b. Write a java program to implement a producer-consumer problem, using threads. (06 Marks)
- c. Explain the mechanism of event delegation model. Give an example for using keyboard event. (10 Marks)
- 4 a. What is a swing? Explain the components and containers in the swings. (08 Marks)
- b. Explain the following, with an example for each: (12 Marks)
 - i) JTextField class
 - ii) JButton class
 - iii) JComboBox class.

PART – B

- 5 a. Explain the J2EE architecture. (06 Marks)
- b. Describe the various steps of JDBC, with code snippets. (10 Marks)
- c. What are the transactions? Explain. (04 Marks)
- 6 a. What is a servlet? What are the phases of servlet life cycle? Give an example. (10 Marks)
- b. Write short notes on: (10 Marks)
 - i) Session tracking
 - ii) Cookies
- 7 a. What are the different types of JSP tags? Demonstrate with a simple JSP program. (10 Marks)
- b. What is RMI? Describe the code snippet RMI at client side. (10 Marks)
- 8 a. What are the different kinds of enterprise beans? Explain. (10 Marks)
- b. What is a deployment descriptor? List the deployment descriptor for EJB 1.1. (06 Marks)
- c. Write a note on JAR file. (04 Marks)

Seventh Semester B.E. Degree Examination, December 2011

C # programming and .Net

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions. Selecting
atleast TWO questions from each part.**

PART – A

- 1 a. Explain the limitations and complexities found within the technologies prior to .Net. Briefly explain how .Net attempts to simplify the same. (10 Marks)
- b. Explain the formal definitions of all possible CTS types. (10 Marks)
- 2 a. Explain the following, with respect to compilation of the C # program in command prompt.
 - i) referencing external assemblies
 - ii) compiling multiple source files
 - iii) response files
 - iv) generating bug reports. (10 Marks)
- b. Explain C # preprocessor directives :
 - i) # region, # endregion
 - ii) conditional code compilation. (05 Marks)
- c. Write a C # program to generate Fibonacci series upto N. value of N is read from console. (05 Marks)
- 3 a. Write a C # program to arrange five names in the ascending order. Names are obtained from command line arguments. (06 Marks)
- b. List the methods in system, object master node. Explain the functionality of the methods Equals, ToString and GetType. (10 Marks)
- c. Explain the params modifier, with suitable code. (04 Marks)
- 4 a. Write a C # program to create a doubly linked list. Methods will be for inserting the node at front end, deleting the node from front end and displaying the contents of the list. (10 Marks)
- b. Explain the following, with suitable code.
 - i) versioning class members
 - ii) properties. (10 Marks)

PART – B

- 5 a. Mention the methods present in system. Exception base class. Explain TargetSite, StackTrace properties. (10 Marks)
- b. Explain how to build a custom exception in C #, using suitable code. (10 Marks)
- 6 a. Define an interface. Explain how it is created in C #, with suitable example. (05 Marks)
- b. Explain how interfaces can be used as polymorphic agents, with suitable code. (08 Marks)
- c. Write an explanatory note on Cloneable interface, with examples. (07 Marks)
- 7 a. What are delegates in C #? Differentiate between the synchronous and asynchronous delegates, with an example. (10 Marks)
- b. Enumerate the concept of events in C #. Explain with suitable code and example. (10 Marks)
- 8 a. Explain the steps involved in building multifile assembly, with an example. (10 Marks)
- b. Explain shared assemblies and private assemblies, in detail, with necessary examples. (10 Marks)

Seventh Semester B.E. Degree Examination, December 2011

Digital Image Processing

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 the fundamental steps in digital image processing, with a neat block diagram. (03 Marks)
- b. Discuss the metric and topological properties of an image. (07 Marks)
- c. Discuss the procedure of quantization and sampling. (10 Marks)
- 2 a. Define histogram equalization. Develop an algorithm for contrast enhancement, using this technique, with a corresponding mathematical model, designed for contrast enhancement. (12 Marks)
- b. Discuss any two interpolation techniques that are used to estimate the intensity information, occurring due to geometric transformations. (08 Marks)
- 3 a. Discuss the iterative optimal threshold detection technique. Find the optimal threshold for the following 5×5 image: (10 Marks)

25	26	24	20	160
25	32	35	158	155
24	33	36	145	154
29	32	32	142	142
28	28	29	26	118

- b. Explain how Hough transform helps in extracting line segments from an image. (10 Marks)
- 4 a. Explain inner boundary tracing and outer boundary tracing algorithms. (08 Marks)
- b. Discuss the procedure of obtaining the segmented regions, using split and merge strategy. (06 Marks)
- c. Discuss the watershed segmentation, in detail. (06 Marks)

PART – B

- 5 a. Devise an algorithm to smooth an image using :
i) Image averaging ii) Median filtering technique (08 Marks)
- b. Define edge. Describe the procedure of extracting edges using canny edge detection technique. (06 Marks)
- c. Discuss Fast Fourier transform, in detail. (06 Marks)
- 6 a. Define image compression. Describe the general image compression model. (06 Marks)
- b. Devise an algorithm that encodes and decodes data using Huffman compression technique. Illustrate for the following data and compute entropy and efficiency. (10 Marks)

Data	S ₁	S ₂	S ₃	S ₄	S ₅	S ₆	S ₇	S ₈
Probability	0.2	0.05	0.01	0.04	0.1	0.3	0.15	0.15

- c. Explain in brief, seen length encoding and decoding scheme. (04 Marks)
- 7 a. Describe the procedure of region identification using 4-neighborhood and 8-neighborhood concepts. (08 Marks)
- b. Explain any three region and contour based shape representation models. (12 Marks)
- 8 a. Define morphology. Discuss binary dilation and erosion, in detail. (08 Marks)
- b. Discuss the procedure of boundary extraction, using morphological operators. (06 Marks)
- c. Explain hit-or-miss transform and region filling morphological algorithms. (06 Marks)

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