USN | | | | | | | | | | | **10CS71**

Seventh Semester B.E. Degree Examination, June/July 2016
Object Oriented Modeling and Design

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. With an example, define a model. What purpose does it serve? Explain.   **(08 Marks)**
   b. With a neat diagram, explain a class model of windowing system.   **(08 Marks)**
   c. Explain qualified association with suitable example.   **(04 Marks)**

2   a. Explain the concept of work around with example.   **(06 Marks)**
   b. Fig.Q2(b) is a partially completed state diagram for the control of a telephone answering machine. The machine detects an incoming call after five rings and answers the call with a prerecorded announcement. When the announcement is complete, the machine records the caller's message. When the caller hangs up, the machine hangs up and shuts off. If someone answers the telephone before five rings, the machine should do nothing. Distinguish between calls in which the telephone is answered on the first ring and one call that rings five times. Draw and explain state model or diagram. Place the following in the diagram: call detect, answer call, play announcement, record message, caller hangs up, announcement complete.
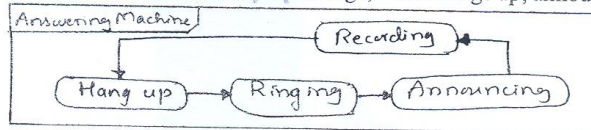

Fig.Q2(b)   **(10 Marks)**
   c. Explain aggregation and composition with example.   **(04 Marks)**

3   a. What are nested states? Explain nested states with an example.   **(04 Marks)**
   b. Consider a physical bookstore, such as in a shopping mall:
     i) List three actors that are involved in the design of a checkout system. Explain the relevance of each actor.
     ii) One use case is the purchase of items. List another use case at a comparable level of abstraction. Summarize the purpose of each use case with a sentence.
     iii) Prepare use case diagram for a physical bookstore checkout system.   **(06 Marks)**
   c. Write the guidelines for sequence model.   **(04 Marks)**
   d. Write scenarios for the following situations:
     Moving a bag of corn, a goose and a fox across a river in a boat. Only one thing may be carried in the boat at a time. If the goose is left alone with the corn, the corn will be eaten. If the goose is left alone with the fox, the goose will be eaten. Prepare two scenarios, one in which something gets eaten and one in which everything is safely transported across the river.   **(06 Marks)**

4   a. Explain the stages in the software development process. Which life cycle would you prefer in the development? Why?   **(10 Marks)**
   b. Draw and explain the initial domain class model for ATM system with valid classes.   **(06 Marks)**
   c. Explain the system conception.   **(04 Marks)**

PART – B

5 a. What are the steps involved in constructing an application class model? **(10 Marks)**

    b. Name the three kinds of control for the external events in a software system. Describe each control in brief. **(10 Marks)**

6 a. Explain the different tasks involved in design optimization. **(10 Marks)**

    b. What are the outputs from reverse engineering? In brief discuss reverse engineering tips. **(10 Marks)**

7 a. What is pattern? Describe the categories of pattern. **(10 Marks)**

    b. Explain the structure of client-dispatcher-server design pattern using CRC. **(10 Marks)**

8 a. What are idioms? Write the steps to implement the counted pointer idiom. **(10 Marks)**

    b. Write notes on:
       i) Benefits of view handler pattern
      ii) Liabilities of view handler pattern **(10 Marks)**

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Seventh Semester B.E. Degree Examination, June/July 2016
Embedded Computing Systems

Time: 3 hrs. 　　　　　　　　　　　　　　　　　　　　　　　Max. Marks:100

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

PART – A

1 　a. 　What is Embedded system? Give one example. 　　　　　　　　　(02 Marks)
　　b. 　Explain briefly the characteristics of Embedded computing application. 　(10 Marks)
　　c. 　Write the top-down view of the embedded system design process and write a requirement chart of model train controller. 　　　　　　　　　(08 Marks)

2 　a. 　Write ARM assembly code to implement the following C assignment.
　　　　z = a (b + c) – d * e 　　　　　　　　　　　　　　　　　(04 Marks)
　　b. 　What is an interrupt priorities mechanism used to handle multiple device interrupts?
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(08 Marks)
　　c. 　What is cache? How it relates to memory system mechanism? Explain different types of cache miss. 　　　　　　　　　　　　　　　　　　　(08 Marks)

3 　a. 　Explain a bus with a DMA controller mechanism? 　　　　　　　　(08 Marks)
　　b. 　Differentiate between Random accesses memories and Read only memories. 　(04 Marks)
　　c. 　List out the I/O devices commonly used in embedded computing systems. Explain briefly any three I/O devices. 　　　　　　　　　　　　　　　(08 Marks)

4 　a. 　For a give basic block, rewrite it in single assignment form and then draw the dataflow graph.
　　　　w = a + b
　　　　x = a – c
　　　　y = x + d
　　　　x = a + c
　　　　f = y + e 　　　　　　　　　　　　　　　　　　　　　(06 Marks)
　　b. 　Explain any two program optimization Techniques. 　　　　　　　(08 Marks)
　　c. 　Write a short note on alarm clocks. 　　　　　　　　　　　　(06 Marks)

PART – B

5 　a. 　Explain the basic function of Real time kernel. 　　　　　　　　(10 Marks)
　　b. 　Give different between monolithic kernel and micro kernel. 　　　　(04 Marks)
　　c. 　Define process. With a diagram, explain state transition of a process. 　(06 Marks)

6 　a. 　What is Interprocess Communication (IPC)? Give an overview of different types of IPC mechanisms adopted by various operating systems. 　　　　　　(10 Marks)
　　b. 　What is deadlock? What are the different conditions favoring deadlock? 　(05 Marks)
　　c. 　Explain the different functional requirement that needs to be evaluated in the selection of an RTOS. 　　　　　　　　　　　　　　　　　　　(05 Marks)

7 a. Explain the structure and characteristics of an I^2C bus.   **(10 Marks)**
   b. Explain Ethernet packet format.   **(05 Marks)**
   c. Explain the following terms :
       Internet security, Internet service stack   **(05 Marks)**

8 a. Explain the following interated development Environment
       Simulators
       Emulators
       Debugger   **(12 Marks)**
   b. Explain the different tools used for hardware debugging.   **(08 Marks)**

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Seventh Semester B.E. Degree Examination, June/July 2016
Programming the Web

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Explain standard XHTML document structure.   (06 Marks)
   b. What is Web server? Describe its general characteristics.   (06 Marks)
   c. Explain with an example the following tags :   (08 Marks)
      i) <a>   ii)<img>   iii) <meta>   iv) <pre>.

2 a. Explain syntactic differences between HTML and XHTML.   (06 Marks)
   b. Explain various selector forms with an example.   (06 Marks)
   c. Develop a complete XHTML document with proper headings, a table with four rows and three columns, a form with two labels, two textbox three checkbox, three radio buttons, a submit and a reset button. (Assume suitable content for the web page).   (08 Marks)

3 a. Describe differences between primitives and objects in Javascript.   (04 Marks)
   b. With an example, explain the following :   (08 Marks)
      i) document·write   ii) alert   iii) confirm   iv) prompt.
   c. Write a XHTML document containing a Javascript function to compute the median of an array of numbers with at least two different data sets.   (08 Marks)

4 a. Explain the navigator object with an example.   (07 Marks)
   b. Explain the following positioning elements with example.   (06 Marks)
      i) Absolute positioning
      ii) Relative positioning.
   c. Explain element visibility with an example.   (07 Marks)

PART – B

5 a. With respect to XML schemas, explain complex types.   (07 Marks)
   b. Explain XSLT processing with an example.   (07 Marks)
   c. Describe XML namespaces and their definition syntax.   (06 Marks)

6 a. Explain for each statement in Perl with an example.   (04 Marks)
   b. Explain Rembering matching with an example.   (05 Marks)
   c. Explain any five CGI·pm functions.   (05 Marks)
   d. Describe built-in list functions in Perl.   (06 Marks)

7 a. Describe logical internal structure of an array in PHP.   (05 Marks)
   b. Explain any five commonly used string functions in PHP.   (05 Marks)
   c. Create a XHTML document with PHP to display the number, square root, square, cube and quadruple using sqrt and pow functions. (The output should contain 10 number).   (10 Marks)

8 a. Explain with an example any four built-in methods for arrays and lists in ruby.   (08 Marks)
   b. Explain directory structure of rails application.   (06 Marks)
   c. Describe simple input and output in ruby with an example.   (06 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2016
Advanced Computer Architecture

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. Define Instruction Set Architecture (ISA). Explain seven dimensions of an ISA.   **(10 Marks)**

   b. Assume a disk subsystem with the following components and MTTF :
   * 10 disks each rated at 1,000,000 hr MTTF
   * 1 SCSI controller, 500,000 – hour MTTF
   * 1 Power supply, 200,000 – hour MTTF
   * 1 Fan, 200, 000 – hour MTTF.
   * 1 SCSI cable, 1,000,000 – hour MTTF.

     Using the simplifying assumptions that the lifetimes are exponentially distributed and that failures are independent, compute the MTTF of the system as a whole.   **(05 Marks)**

   c. List and explain four important technologies, which change at a dramatic pace and are critical to modern implementation.   **(05 Marks)**

2   a. With a neat diagram, explain the classic five stage pipeline for a RISC processor.   **(10 Marks)**

   b. List three major hurdles of pipelining. Explain the concept of minimizing data hazards stalls by forwarding using the example below :

DADD	R1, R2, R3
DSUB	R4, R1, R5
AND	R6, R1, R7
OR	R8, R1, R9
XOR	R10, R1, R11.

     (10 Marks)

3   a. Show how the below loop would look on MIPS 5 – stage pipeline, under the following situations. Also find the number of cycles per iteration for each case. Latency of LOAD is 2, ADD.D is 3, store is 1, DADDUI is 2 and Branches is 1.   **(12 Marks)**

Loop :	L.D	F0, 0(R1)
	ADD.D	F4, F0, F2
	SD	F4, 0(R1)
	DADDUI	R1, R1, # -8
	BNE	R1, R2, Loop

     i) Without scheduling, without unrolling   ii) With scheduling, without unrolling.
     iii) With loop unrolling, without scheduling   iv) With loop unrolling, with scheduling.

   b. What is the drawback of 1 – bit dynamic branch prediction method? Clearly state how it is overcome in 2 – bit prediction. Give the state transition diagram of 2 – bit predictor.

     (08 Marks)

4   a. Explain the basic VLIW approach for exploiting ILP, with multiple issues using the following example. We have a VLIW that could issue two memory references, two FP operations and one integer or branch every clock cycle. Use the unrolled version of the code given in question 3a. How many clock cycles per result does it require?   **(10 Marks)**

   b. What is Branch Target Buffer? With a neat diagram, explain the steps when using BTB.
     (10 Marks)

PART – B

5   a. With the help of neat diagram, explain the basic structure of centralized shared memory and distributed memory multiprocessor. **(10 Marks)**

     b. Explain directory based cache coherence for a distributed memory multiprocessor system along with the state transition diagram. **(10 Marks)**

6   a. List the basic cache optimization techniques. Explain any four. **(10 Marks)**

     b. Assume we have a computer where the CPI is 1.0 when all memory accesses hit in the cache. The only data accesses are loads and stores and these total 50% of the instructions. If the miss penalty is 25 clock cycles and the miss rate is 2%, how much faster would the computer be if all instructions were cache hits? **(10 Marks)**

7   a. Which are the major categories of advanced optimizations of cache performance? Explain multibanked caches to increase cache bandwidth. **(10 Marks)**

     b. Explain in detail, the architecture support for protecting processes from each other via virtual memory. **(10 Marks)**

8   a. Explain the architecture of IA64 intel processor and also the prediction and speculation support provided. **(10 Marks)**

     b. Explain in detail, the hardware support for preserving exception behavoiur during speculation. **(10 Marks)**

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10CS/IS753

Seventh Semester B.E. Degree Examination, June/July 2016
JAVA and J2EE

Time: 3 hrs.

Max. Marks:100

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

PART – A

1 a. Explain the process of compiling and running the JAVA application, with the help of "Hello world" program. **(08 Marks)**
   b. Explain the syntax of for-each loop. Write a JAVA program to search a key element by using for-each loop. **(08 Marks)**
   c. Correct the errors from the following code and explain:
      byte   b = 50;
            b = b * 2;   **(02 Marks)**
   d. Write the output of the following code:
      byte   b;
      int   i = 257;
      double   d = 323.142;
      b = (byte) i;
      system.out.print𝓵n(b);
      b = (byte) d;
      system.out.print𝓵n(b);   **(02 Marks)**

2 a. What is an applet? Explain different stages in life cycle of applet. **(07 Marks)**
   b. Create a class figure in JAVA, with following members dim 1, dim 2 and abstract method area. Create a subclasses Triangle, Rectangle with implementation of area. **(07 Marks)**
   c. Explain dynamic method dispatch in Java with example program. **(06 Marks)**

3 a. What do you mean by thread? Explain the different ways of creating threads. **(08 Marks)**
   b. Write a JAVA program to create two threads, one displays "computer science" and another displays "information science" five times. **(08 Marks)**
   c. Write a JAVA program to find a factorial of N numbers recursively. **(04 Marks)**

4 a. What is swing? Explain important features of swing. **(04 Marks)**
   b. Explain the following with an example for each:
      i)   JTextField
      ii) JTable
      iii) JComboBox   **(12 Marks)**
   c. Explain components and containers in the swing. **(04 Marks)**

PART – B

5 a. Explain J2EE architecture. **(08 Marks)**
   b. Briefly explain the callable statement object. Write a program to call stored procedure using callable statement. **(08 Marks)**
   c. Give JAVA syntax for the following :
      i)   Selecting the rows from employee table.
      ii) Counting number of employees working in "research" department. **(04 Marks)**

6   a.   What are Servlet? Briefly explain the application of servlet in web programming.   **(04 Marks)**
    b.   Write short notes on:
         i)   Session tracking
         ii) Cookies   **(08 Marks)**
    c.   Write a JAVA Servlet to read name from client page and say Hello to the name as response.
                                                                                            (08 Marks)

7   a.   What is JSP? Explain the different types of JSP tags.   **(06 Marks)**
    b.   What is RMI? Describe the code snippet RMI at client side.   **(10 Marks)**
    c.   Write the differences between JSP and Servlets.   **(04 Marks)**

8   Write short notes on:
    a.   Session JAVA beans
    b.   Entity JAVA beans
    c.   JAR file
    d.   Deployment descriptor for EJB 1.1   **(20 Marks)**

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Seventh Semester B.E. Degree Examination, June/July 2016

C# Programming and .NET

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Explain the basic workflow that takes between source code, a given .NET compiler and mscorel.dll.   **(10 Marks)**

   b. Explain the following terms:
     i) CLS
     ii) CIL
     iii) ASSEMBLY
     iv) MANIFEST   **(10 Marks)**

2 a. What is csc.exe? List the different output options available in C# compiler.   **(07 Marks)**

   b. Write a note on .NET namespaces in C#.   **(05 Marks)**

   c. Explain how to build visual studio .NET test application that reference external assembly.   **(08 Marks)**

3 a. Write a C# program to find the roots of a quadratic equation $ax^2 + bx + c = 0$, read coefficients a, b, c from user.   **(10 Marks)**

   b. Explain any five members of System.Object.   **(05 Marks)**

   c. What is the role of System.Text.String Builder and how is it different from System.String?   **(05 Marks)**

4 a. What is encapsulation? Explain the two ways of enforcing encapsulation with example each.   **(10 Marks)**

   b. Write a C# program that shows the C#'s polymorphic support for the following Fig.Q4(b).

Fig.Q4(b)

By using the necessary data members to compute area of each shape.   **(10 Marks)**

PART – B

5 a. Write a C# program that will read a name from the keyboard and display it on the screen. The program should throw an exception when the length of name is more than 15 characters. Design your own exception.   **(10 Marks)**

   b. What is object lifetime? Explain the sequence of events involved in finalization process.   **(10 Marks)**

6   a.   Declare a class box that has 2 data members length (inches) and width (inches. The class implements 2 interfaces IEnglishDimention and IMetricDimension that returns length, width in metric dimensions (m = inch∗2.54). Each of these interfaces have 2 methods length( ) and width( ). Write a C# program to create the class and to instantiate an object of that type and use all the functions.   **(10 Marks)**

      b.   Explain the following interfaces:
      i)   Icomparable
      ii)   Iconvertible
      iii)   Icloneable
      iv)   Interface hierarchies   **(10 Marks)**

7   a.   What are delegates? Explain the concept of multicast delegate with example.   **(10 Marks)**

      b.   Write a C# program to do the following on complex numbers C1 and C2 using operator overloading
      C1 + C2, C1 – C2 and C1 != C2.   **(10 Marks)**

8   a.   What is a .NET assembly? How to build shared assembly? Explain in detail with a program.   **(10 Marks)**

      b.   What is multifile assembly? Explain how to build and consuming a multifile assembly.   **(10 Marks)**

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Seventh Semester B.E. Degree Examination, June/July 2016
Storage Area Networks

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. What is a data center? Explain key characteristics of data center elements. **(10 Marks)**
   b. Explain the various components of disk drive. **(06 Marks)**
   c. Consider a disk I/O system in which an I/O request arrives at the rate of 80IOPS. The disk service time is 6 ms. Compute the following:
      i) Utilization   ii) Response time
      iii) Average queue size   iv) Time spent by a request in a queue. **(04 Marks)**

2 a. Explain the various techniques on the basis of which RAID levels are defined. **(09 Marks)**
   b. An application has 1000 heavy users at a peak of 2 IOPS each and 2000 typical users at a peak of 1 IOPS each, with a read/write ratio of 2:1. It is estimated that the application also experiences an overhead of 10 percent for other workloads. Calculate the IOPS requirement for RAID1, RAID5 and RAID6. **(06 Marks)**
   c. With a neat diagram, differentiate between write through and write back cache. **(05 Marks)**

3 a. Explain fibre channel with respect to protocol stack, zoning and login types. **(10 Marks)**
   b. Write a note on SCSI-3 architecture. **(10 Marks)**

4 a. What is NAS? Explain the benefits of NAS. **(10 Marks)**
   b. Differentiate between Native and Bridged iSCSI connectivity. **(06 Marks)**
   c. Write a note on iSCSI PDU. **(04 Marks)**

PART – B

5 a. With neat diagrams, explain the concept of object storage and retrieval in CAS systems. **(10 Marks)**
   b. What is storage virtualization? Differentiate between block level and file level virtualization with neat diagrams. **(10 Marks)**

6 a. What is business continuity? Explain BC planning life cycle with a neat diagram. **(10 Marks)**
   b. Explain the reasons for which backup is performed. **(10 Marks)**

7 a. Describe the various storage array based local replication technologies. **(10 Marks)**
   b. What is storage array based remote replication? Differentiate between synchronous and asynchronous replication mode in it. **(10 Marks)**

8 a. Explain the four security attributes which are under threat. **(04 Marks)**
   b. Write a note on risk triad. **(06 Marks)**
   c. Describe the categories on the basis of which storage management is classified. **(05 Marks)**
   d. Write a note on accessibility monitoring. **(05 Marks)**

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