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10CS71

Seventh Semester B.E. Degree Examination, June/July 2017
Object Oriented Modeling and Design

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 object oriented development? Explain briefly the stages involved in object oriented methodology. (10 Marks)
- b. Discuss the purpose of three models. (06 Marks)
- c. Prepare a class diagram from the object diagram shown in Fig.Q1(c). Explain multiplicity decision. (04 Marks)

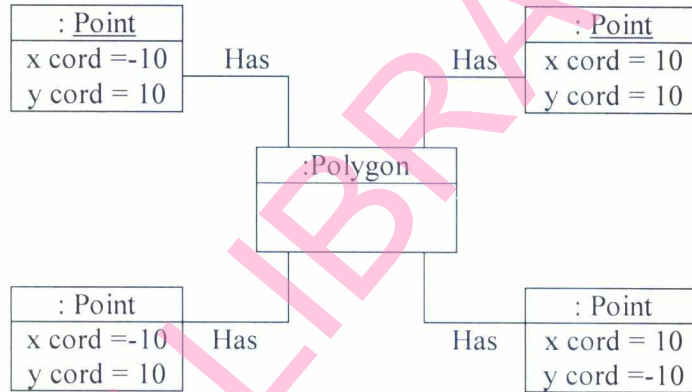


Fig.Q1(c)

- 2 a. Explain the following using suitable examples:
 (i) Enumerations (ii) Scope (iii) Multiplicity for attributes. (08 Marks)
 b. What is an event? Discuss the various kinds of events using UML notations. (08 Marks)
 c. Design and describe a guarded transition diagram for traffic lights at an intersection. (04 Marks)
- 3 a. Prepare a use case diagram for computer email system with minimum two actors. Explain the relevance of each actor with corresponding use case. (08 Marks)
 b. Explain with suitable examples the following :
 (i) Include relationship (08 Marks)
 (ii) Extend relationship (04 Marks)
 c. What are transient object? Exhibit transient object with a sequence diagram. (04 Marks)
- 4 a. What is a problem statement? Briefly discuss on the kinds of requirements. (10 Marks)
 b. List out the steps to construct a domain class model. (04 Marks)
 c. For an ATM Bank system. Prepare a data dictionary for all modeling elements. (06 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. Describe application analysis with an example of ATM banking system. (10 Marks)
b. Explain in detail how a system is broken into subsystems. (10 Marks)
- 6 a. Explain the consideration for choosing alternative algorithm. (06 Marks)
b. Clearly differentiate between forward engineering and reverse engineering. (04 Marks)
c. Mention the steps involved in implementation modeling. Explain the first step. (10 Marks)
- 7 a. What is a pattern? Explain the model-view-controller design pattern for software architecture with OMT diagram. (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. Explain briefly. (10 Marks)
b. What are Idioms? How do they differ from design pattern? Explain necessary steps for implementing the counted pointer idiom. (10 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2017
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? Explain the characteristics of embedded computing applications. (06 Marks)
- b. Write a requirement chart for GPS moving map device. (04 Marks)
- c. Define design methodology. Explain with a neat sketch the embedded design process. (10 Marks)
- 2 a. Write a ARM assembly code for the below c- statement $Z = (a < 2) | (b \& 15)$. (04 Marks)
- b. With a neat figure explain the ARM programming model. (04 Marks)
- c. With a neat diagram, explain the interrupt mechanism. (06 Marks)
- d. Define address translation. Explain address translation for segment. (06 Marks)
- 3 a. With a neat sketch, explain the bus with a DMA controller. (06 Marks)
- b. Discuss the hardware architecture of a typical PC as a platform. (08 Marks)
- c. Explain the working of keyboard and touch screen I/O devices. (06 Marks)
- 4 a. With a neat diagram, explain program generation from compilation through loading. (08 Marks)
- b. Consider the following C-code statement :

```
if (a + b > 0)
    x = 5;
else x = 7;
```

 - i) Write CDFG for the above C statement
 - ii) Generate the ARM assembly code for the above C statements. (08 Marks)
- c. Explain the different ways of measuring program performance. (04 Marks)

PART – B

- 5 a. With the figure of operating system architecture explain the different kernel services. (10 Marks)
- b. Explain monolithic kernel and micro kernel models with necessary figures. (06 Marks)
- c. Discuss various types of multitasking existing in the operating systems context. (04 Marks)
- 6 a. Define blocking and unblocking communications (04 Marks)
- b. Explain shared memory communication with a neat sketch. (08 Marks)
- c. Discuss message passing and signal interprocess communications. (08 Marks)
- 7 a. With a neat diagram, explain the distributed embedded architecture. (06 Marks)
- b. Discuss the working of Ethernet CSMA/CD algorithm. (08 Marks)
- c. Explain internet service stack with a neat figure. (06 Marks)
- 8 a. What is simulator? Explain the features, advantages and limitations of simulator based debugging. (10 Marks)
- b. With a neat sketch, explain the monitor program based firmware debugging. (10 Marks)

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10CS73

Seventh Semester B.E. Degree Examination, June/July 2017
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. What is HTTP? Explain its phases in detail. (06 Marks)
 - b. Explain the following tags with examples:
(i) meta (ii) img (iii) a (iv) content-based style tags (09 Marks)
 - c. Explain the standard XHTML document structure. (05 Marks)

- 2
 - a. Create, test and validate a XHTML document that has five frames. There must be two rows of frames, the first with three frames and the other with two frames. The frames in the first row must have equal width. The left frame in the second row must be 55 percent of the width of the display. Each of the frames in the top row must display a document that has a form. The left top frame must have two text boxes, each 30 characters wide, labeled Name and Address. The middle top frame must have five radio buttons with color name labels. The right top frame must have four checkboxes, labeled with four kinds of car equipment such as a CD player and air conditioning. The two bottom frames must have images of two different cars. The top row of frames must use 20 percent of the height of the display. (08 Marks)
 - b. Explain different levels of style sheets and their style specification formats. (06 Marks)
 - c. Create and test a XHTML document that describes nested ordered lists of cars. The outer list must have three entries: Compact, midsize and sports. Inside each of these three lists there must be two sublists of body styles. The compact and midsize car sublists are two door and four door, the sports car sublists are coupe and convertible. Each body-style sublist must have at least three entries, each of which is the make and model of a particular car that fits the category. The outer list must use uppercase Roman numerals, the middle lists must use uppercase letters, and the inner lists must use Arabic numerals. The background color for the compact car list must be pink, for the midsize car list it must be blue, for the sports car list, it must be red. All of the styles must be in a document style sheet. (06 Marks)

- 3
 - a. Explain the JS (JavaScript) string properties and methods with an example. (06 Marks)
 - b. Explain the different methods for the Date object in JavaScript. (05 Marks)
 - c. Write a JavaScript to compute the real roots of a given quadratic equation. (05 Marks)
 - d. Write a JavaScript to illustrate an array of arrays. (04 Marks)

- 4
 - a. Write a JavaScript to compare two passwords. (07 Marks)
 - b. Explain the DOM Tree Traversal and DOM Tree Modification. (05 Marks)
 - c. Write a JavaScript to illustrate dynamic stacking of images. (08 Marks)

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PART – B

- 5 a. Create a XML document that lists ads for used airplane. Create a DTD for the same document. (10 Marks)
- b. Create a XML document for one student of VTU to illustrate XSLT formatting. Create XSLT style sheet by using child templates. (06 Marks)
- c. Explain the purposes of XML processors. (04 Marks)
- 6 a. Explain the uses of Perl. (03 Marks)
- b. Write Perl program for the following :
 Input : A file of text in which all words are separated by whitespace or punctuation, possibly followed by whitespace, where the punctuation can be a comma, a semicolon, a question mark, an exclamation point, a period or a colon. The input file is specified on the command line.
 Output : A list of all unique words in the input file in alphabetical order. (06 Marks)
- c. Explain briefly session and cookies in Perl. (04 Marks)
- d. Write a CGI-Perl program to use a cookies to remember the day of the last login from a user and display it when run. (07 Marks)
- 7 a. Create a XHTML document that uses PHP script to display the square root, square, cube and quad of numbers from 1 to 1 in the form of a table with the column labels as number, square root, square, cube and quad. (05 Marks)
- b. Explain in detail the database access with PHP and MySQL along with the examples. (15 Marks)
- 8 a. Describe briefly the MVC architecture and the ORM used by rails. (08 Marks)
- b. Explain Ruby string methods with an example. (08 Marks)
- c. Write a Ruby program for the following :
 input : Four numbers, representing the values of a, b, c and x.
 output : The value of the expression
 $a * x ** 2 + b * x + c$ (04 Marks)

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Seventh Semester B.E. Degree Examination, June/July 2017
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 the following terms : i) Computer Architecture ii) Learning curve
 iii) Response time iv) Throughput. (04 Marks)
 - b. Define Amdahl's law. Derive an expression for CPU clock as a function of instruction count, clock per instruction and clock cycle time. (08 Marks)
 - c. Find the die yield for dies that are 1.5cm on a side and 1.0cm on a side, assuming a defect density of 0.4 per cm² and is 4. (04 Marks)
 - d. Explain the main measures of dependability. (04 Marks)
- 2
 - a. What is Pipeline? Explain the basic of RISC instruction set. (06 Marks)
 - b. What are the major hurdles of pipelining? Illustrate the data hazard. (10 Marks)
 - c. Consider the unpipelined processor in RISC. Assume that it has a 1ns clock cycle and that it uses 4 cycles for ALU operations and branches and 5 cycles for memory operations. Assume that the relative frequencies of these operations are 40%, 20% and 40% respectively. Suppose that due to clock skew and setup, pipelining the processor adds 0.2ns of overhead to the clock. Ignoring any latency impact, how much speedup in the instruction execution rate will we gain from a pipeline? (04 Marks)
- 3
 - a. Explain how Tomasulo's algorithm can be extended to support speculation. (08 Marks)
 - b. What are the basic compiler techniques for exposing ILP? Explain briefly. (08 Marks)
 - c. Explain the dynamic branch prediction state diagram. (04 Marks)
- 4
 - a. What are the types of dependencies? Explain in detail with example. (10 Marks)
 - b. Explain the seven fields of each reservation station and register field. (06 Marks)
 - c. Suppose we have a VLIW that could issue two memory references, two FP operations and one integer operations or branch in every clock cycle, show an unrolled version of the loop $x(i) = x(i) + S$, for such a processor. Unroll as many times as necessary to eliminate any stalls. Ignore the delayed branches : (04 Marks)

MIPS	Code
Loop : L.D	F ₀ , O(R1) ;
ADD.D	F ₄ , F ₀ , R ₂ ;
S.D	F ₄ , O(R1) ;
DADDU1	R1, R1, #-8 ;
BNE	R1, R2, LOOP ;

PART – B

- 5
 - a. With a neat diagram, explain the basic structure of a centralized shared memory and distributed memory multiprocessor. (08 Marks)
 - b. Suppose you want to achieve a speedup of 80 with 100 processors. What fraction of the original computation can be sequential? (04 Marks)
 - c. Explain basic schemes for enforcing coherence. (08 Marks)

- 6 a. Explain the six basic cache optimization techniques. (10 Marks)
b. With a neat diagram, explain the hypothetical memory hierarchy. (10 Marks)
- 7 a. Explain the following advanced optimization of cache :
i) Compiler optimizations to reduce miss rate.
ii) Merging write buffer to reduce miss penalty.
iii) Critical word first and early restart to reduce miss penalty. (09 Marks)
b. Assume that the hit time of a two way set associative first level data cache is 1.1 times faster than a four – way set – associative cache of the same size. The miss falls from 0.049 to 0.044 for an 8kB data cache. Assume a hit is 1clock cycle and that the cache is the critical path for the clock. Assume that the miss penalty is 10 clock cycles to the L2 cache for the two way set associative cache and that the L2 cache does not miss, which has the faster average memory access time? (06 Marks)
c. Explain Internal organization of 64Mb DRAM. (05 Marks)
- 8 a. Explain in detail the hardware support for preserving exception behaviour during speculation. (10 Marks)
b. Explain hardware support for exposing parallelism for VLIW & EPIC. (10 Marks)

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10IS74

Seventh Semester B.E. Degree Examination, June/July 2017

Data Warehousing and Mining

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 Data warehouse? Explain in detail the different key features of warehouse. (10 Marks)
- b. Explain in detail the difference between ODS and warehouse. (05 Marks)
- c. What is Data Mart? (05 Marks)

- 2 a. What are the different types of OLAP operations? Explain them with suitable example. (10 Marks)
- b. What is Data cube? With figure, explain different structure of data cubes. (10 Marks)

- 3 a. Explain in detail different types of data preprocessing techniques. (10 Marks)
- b. With suitable example, explain Minkowski distance metric. (10 Marks)

- 4 a. Consider data transaction ID : (10 Marks)

TID	1	2	3	4	5	6	7	8	9	10
Items	{a,b}	{b,c,d}	{a,c,d,e}	{a,d,e}	{a,b,c}	{a,b,c,d}	{a}	{a,b,c}	{a,b,d}	{b,c,e}

Apply FP growth algorithm to find frequent itemset ending in 'e'.

- b. Write a procedure in Apriori – gen function, which merges a pair of frequent item set. Explain with example. (10 Marks)

PART – B

- 5 a. Construct decision tree for a mammal classification problem. Discuss design issues of decision tree. (10 Marks)
- b. Write an algorithm for skeleton decision tree and describe different functions used in the algorithm. (10 Marks)

- 6 a. Estimate conditional probabilities of continuous attribute by Naïve Baye's classifier. (10 Marks)
- b. Explain in detail Bagging and Boosting accuracy of classifier. (10 Marks)

- 7 a. Briefly outline how to compute dissimilarity between object described by following types of variables in cluster :

i) Interval scaled variable ii) Binary variable. (10 Marks)

- b. What is Clustering? Describe the following approaches to clustering method :

i) Partitioning method ii) Hierarchical methods.

Give example in each case. (10 Marks)

- 8 Write short notes on :

- a. Multiclass problem.
- b. Mining raster database.
- c. Automatic classification of web document.
- d. Construction of multilayered web information base. (20 Marks)

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10CS/IS753

Seventh Semester B.E. Degree Examination, June/July 2017
JAVA and J2EE

Time: 3 hrs.

Max. Marks: 100

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

PART – A

1.
 - a. Explain Java buzzwords: Distributed and Multithreaded. (05 Marks)
 - b. Explain for.. each version of loop. Write a Java program to display 2D consisting student data: Name and USN. Print this in a neat format. (05 Marks)
 - c. Explain Java application development steps and JVM. (05 Marks)
 - d. Explain different access specifiers. (05 Marks)
2.
 - a. What are the different salient features of constructors? Write a Java program to show these features. (07 Marks)
 - b. How interfaces are useful over abstract classes? Justify this with a program. (05 Marks)
 - c. With a program, show how final keyword is used to prevent inheritance and overriding. (04 Marks)
 - d. With a Java program, throw a customized exception. (04 Marks)
3.
 - a. What are the different ways to create threads? Write a multithreaded program to display "Hello", "thread" separately by threads. (06 Marks)
 - b. Mention and explain different stages of applet life cycle. Give the sketches. (07 Marks)
 - c. Write event driven Java Applet program to add two buttons. Add event handler to play and stop audio clip "Sample.wav". (07 Marks)
4.
 - a. Explain different container class of swing. Write a swing program to perform following :
 - (i) To add a button, a label, 2 text fields
 - (ii) On click of button transfer text from first text field to second text field.
 - (iii) Also display uppercase text in label with font "Times New Roman", and size:12 (08 Marks)
 - b. What are problem with AWT? How these are solved in swing? (05 Marks)
 - c. Write a Java program to create JTable. Also event hander to add Name and USN which are entered through text fields. Event is performed on click of button. (07 Marks)

PART – B

5.
 - a. Explain JDBC connection process. With a code snippet, how do you test JDBC drivers? (10 Marks)
 - b. Write Java program snippet to update EMPLOYEE table with fields ENO, ESAL. Set ESAL to 5000 to all employees whose salary < 5000. (10 Marks)
6.
 - a. Write a servlet program to display square of number, which is passed through parameter from client. (08 Marks)
 - b. Explain the life cycle of servlet. (05 Marks)
 - c. Write note on session tracking by servlet. (07 Marks)

- 7 a. Explain different JSP tags. Write a program to show usage of these tags. (10 Marks)
b. Explain RMI. Write a program using RMI to concatenate two strings, passed by client. (10 Marks)
- 8 a. What are different EJBs? Explain. (08 Marks)
b. With skeleton program, mention and explain different methods associated with message driven bean. (08 Marks)
c. Write a note on JAR. (04 Marks)

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10CS/IS761

Seventh Semester B.E. Degree Examination, June/July 2017
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. What is an assembly? Explain each component of an assembly. Differentiate between single and multife assembly. (08 Marks)
- b. Write a note on .NET namespace. (04 Marks)
- c. Explain the working of CLR with an neat diagram. (08 Marks)
- 2 a. Define C# preprocessor directive. Explain any three directive. (08 Marks)
- b. Explain how csc.exe command is used to built C# application on .NET. Explain any five flags with appropriate examples. (06 Marks)
- c. Explain the following with respect to C# program in command prompt.
i) Generating Bug report ii) Compiling multiple source file. (06 Marks)
- 3 a. Explain the following types with an example with reference to C#. i) foreach ii) ref
iii) params iv) verbatim v) enum. (10 Marks)
- b. Explain the Anatomy of simple C# program and variations in main method. (06 Marks)
- c. Explain boxing and unboxing with an example. (04 Marks)
- 4 a. Explain how encapsulation is enforced in C# with a small program for each method. (08 Marks)
- b. Explain the two different roles of 'this' keyword with an example. (06 Marks)
- c. Explain virtual and override keywords. (06 Marks)

PART – B

- 5 a. List and explain with code, core members of System.Exception type. (10 Marks)
- b. With an example, explain forcing a Garbage collection and the need for forcing Garbage collection. (05 Marks)
- c. Write a C# application to illustrate handling multiple exceptions. (05 Marks)
- 6 a. Explain the three different way of obtaining interface reference. (09 Marks)
- b. Explain the following interfaces and its Role i) I convertible ii) I comparable. (06 Marks)
- c. Explain how to achieve shallow and deep copy in C#. (05 Marks)
- 7 a. What are the main advantages of C# events? (05 Marks)
- b. What are delegates? Explain the members of System.Multicast delegates. Give a small program to implement multicasting. (10 Marks)
- c. Write a program in C# to sort and reverse an array of 5 elements using sort () and reverse () methods. (05 Marks)
- 8 Write short notes on :
 - a. Cross language inheritance
 - b. Object Generations
 - c. Physical and logical view and assembly
 - d. Building a multife assembly. (20 Marks)

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10CS/IS765

Seventh Semester B.E. Degree Examination, June/July 2017
Storage Area Networks

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 evolution of storage technology. (05 Marks)
b. Describe ILM implementation in detail with its benefits. (05 Marks)
c. Explain disk drive components, with suitable diagram. (10 Marks)
- 2 a. Explain the following with appropriate diagrams : (10 Marks)
i) Raid 0 ii) Raid 1 iii) Nested Raid iv) Hot spares.
b. With a neat diagram, explain the components of Intelligent Storage System (ISS). (05 Marks)
c. With a neat diagram, explain the features of high end storage systems. (05 Marks)
- 3 a. Explain disk drive interface, with neat diagram. (05 Marks)
b. Describe SCSI – 3 architecture in detail with diagram. (05 Marks)
c. Explain FC connectivity with related diagram. (10 Marks)
- 4 a. Describe NAS implementations and benefits, with a neat diagram. (10 Marks)
b. Explain NAS file sharing protocols. (05 Marks)
c. Explain iSCSI protocol stack, with a neat diagram. (05 Marks)

PART – B

- 5 a. Explain object storage and retrieval in CAS, with suitable diagrams. (10 Marks)
b. Describe storage virtualization types in detail and discuss its challenges. (10 Marks)
- 6 a. Describe the failure analysis in BC. Briefly explain BC technology solution. (10 Marks)
b. With a neat diagram, explain the steps involved in backup and restore operation. (10 Marks)
- 7 a. Explain the following : i) Uses of local replica ii) LVM – based replication (10 Marks)
iii) Full – volume mirroring.
b. What is Remote Replication? Explain Host – based remote replication, with a neat diagram. (10 Marks)
- 8 a. Briefly explain the SAN security architecture also discuss the protection strategies implemented in various security zones. (10 Marks)
b. Describe Storage Management activities in detail with example. (10 Marks)

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