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Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
Object-Oriented Modeling and Design

Time: 3 hrs.

Max. Marks:100

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

- 1 a. What is Object Orientation? Elaborate on the major themes that are well supported in Object Oriented technology. (08 Marks)
- b. Use illustrations and explain the following with UML convention.
 i) Class ii) Values and attributes iii) Operations and Methods. (06 Marks)
- c. What is generalization? Briefly discuss the generalization for equipments with neat diagram. (06 Marks)
- 2 a. Explain the following: i) Association Ends ii) N-ary Association iii) Constraints on links (06 Marks)
- b. Explain the summary of basic state diagram notation with style conventions. (08 Marks)
- c. What is state? Explain the various characterizations of a state. (06 Marks)
- 3 a. What is a nested state? Illustrate the importance of aggregation concurrency with the help of a state diagram. (08 Marks)
- b. Explain use case relationship with a neat diagram. List the guidelines for use case relationships. (08 Marks)
- c. Explain Swimlanes with a neat activity diagram. (04 Marks)
- 4 a. Identify the classes for ATM bank system. What criteria would you take into consideration to select right classes? Explain. (08 Marks)
- b. What is System conception? List and explain questions that must be answered by a good system concept. (08 Marks)
- c. Differentiate between waterfall approach and iterative approach. (04 Marks)

PART – B

- 5 a. List and explain the steps for constructing application state model. (10 Marks)
- b. Describe the steps involved to allocate each concurrent sub-system to a hardware unit, either a general purpose processor or a fractional unit. (10 Marks)
- 6 a. Briefly discuss the design optimization and explain its tasks in detail. (08 Marks)
- b. What is fine-tuning classes? Explain fine-tuning generalization by developing a translation model. (08 Marks)
- c. Explain how to bridge the gap from high-level requirements to low-level services in class design. (04 Marks)
- 7 a. What is Pattern? Explain briefly properties of patterns for software architecture. (08 Marks)
- b. Explain client-dispatcher design pattern. (08 Marks)
- c. Describe three categories of patterns. (04 Marks)
- 8 a. Explain the command processor design pattern. (08 Marks)
- b. What are idioms and styles? Explain with the help of an example. (04 Marks)
- c. Write a note on:
 - i) Structure of view handler pattern.
 - ii) Consequence of view handler pattern. (08 Marks)

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10CS72

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
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. Define Embedded System. What are the characteristic and constraints of an Embedded System? (06 Marks)
- b. What are the challenges faced in design an Embedded System? (06 Marks)
- c. Explain the major steps in the embedded System Design Process. (08 Marks)
- 2 a. List and explain the Data Operations in ARM Processor. (08 Marks)
- b. Explain the implementations of direct-mapped cache and set associative cache with a neat diagram. (08 Marks)
- c. Assume that a system has a two level cache. The Level 1 cache has a hit rate of 90% and the Level 2 cache has a hit rate of 97%. The Level 1 cache access time is 4 ns, the level 2 cache access time is 15 ns, and the main memory access time is 80 ns. What is the average memory access time? (04 Marks)
- 3 a. Define Bus. Explain the structure of a Typical Bus that supports read and write. Discuss the timing diagram for Bus. (07 Marks)
- b. Explain the different types of Memories used in Embedded System with their functions. (05 Marks)
- c. List the Hardware and Software tools used for Debugging Embedded Systems. Explain the internal architecture of a logic analyzer with a neat diagram. (08 Marks)
- 4 a. Briefly discuss three components that are commonly used in Embedded Software. (10 Marks)
- b. What are Loops? List and explain three important techniques in optimizing loops. (10 Marks)

PART - B

- 5 a. What is RTOS? Explain the different services provided by RTOS. (06 Marks)
- b. Explain the different Message Passing techniques used for IPC. (07 Marks)
- c. Three processes with process IDs P1, P2, P3 with estimated completion time 12, 10, 6 milliseconds respectively enters the ready queue together. Process P4 with estimated execution completion time 2 milliseconds enters the ready queue after 3 milliseconds. Calculate the waiting time and Turn Around Time (TAT) for each process and the Average Waiting and Turn Around Time in the SRT scheduling. (07 Marks)
- 6 a. Explain the Functional and Nonfunctional requirements in the selection of an RTOS for an Embedded System Design. (10 Marks)
- b. Explain the following briefly: (i) Shared Memory Communication (ii) Advanced Configuration and Power Interface (ACPI) (10 Marks)
- 7 a. Briefly discuss the different types of Interconnection networks. (05 Marks)
- b. Describe the features of: (i) I²C Bus (ii) CAN Bus (10 Marks)
- c. Explain the Ethernet Packet format. (05 Marks)
- 8 a. Explain the following: (i) Magnifying glass (ii) Multimeter (iii) Digital CRO (iv) Function Generator (08 Marks)
- b. What is a Simulator? Explain the advantages and limitations of Simulator based Debugging. (07 Marks)
- c. Write a short note on Disassembler/Decompiler. (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.

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Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
Programming in Web

Time: 3 hrs.

Max. Marks: 100

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

PART – A

- 1 a. Illustrate with a neat diagram, the working of Domain Name Server. (08 Marks)
- b. Why MIME is required in HTTP Responses? Write the format of MIME specification. (04 Marks)
- c. Demonstrate with an example, the use of the following XHTML tags : (08 Marks)
 - i) <sub> ii) <sup> iii) <meta> iv) .
- 2 a. Enlist and explain with an example the different types of lists used in XHTML documents. (09 Marks)
- b. Demonstrate with an example the different levels of CSS. (06 Marks)
- c. List and briefly explain Selector Forms used in CSS. (05 Marks)
- 3 a. Explain JavaScript's Screen Output and Keyboard Input functions. (10 Marks)
- b. With the help of an example for each, explain any 5 array methods of Javascript. (10 Marks)
- 4 a. Analyse the DOM structure of Javascript and explain its working. (06 Marks)
- b. Explain the 2 techniques to access form elements in Javascript. (08 Marks)
- c. Demonstrate the use of Onclick event on the input tag. (06 Marks)

PART – B

- 5 a. How are Elements , Attributes and Entities declared in DTD? (12 Marks)
- b. What is XSLT used for? With the help of a neat diagram, explain the working of XSLT processor. (08 Marks)
- 6 a. Explain the 3 types of variables in Perl. Give example for each. (12 Marks)
- b. Explain Perl's File Input and Output functions. Demonstrate how to read and write a file. (08 Marks)
- 7 a. How are Array's created in php? Explain the explode and implode functions of php. (08 Marks)
- b. Demonstrate with an example program , how Form Data is handled in php. (08 Marks)
- c. What are Cookies? How do we write and read a Cookie in php? (04 Marks)
- 8 a. Explain Ruby's Screen Output and Keyboard Input functions. (06 Marks)
- b. How are Classes declared and Inherited in Ruby? (04 Marks)
- c. Write a note on Rail's framework and its Directory structure. (10 Marks)

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10CS74

Seventh Semester B.E. Degree Examination, Jan./Feb.2021
Advanced Computer Architecture

Time: 3 hrs.

Max. Marks:100

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

PART - A

- 1 a. Define Instruction Set Architecture (ISA). Illustrate the seven dimensions of an ISA. (08 Marks)
- b. State and explain Amdahl's law. Also represent speedup ratio. (05 Marks)
- c. Find the die yield for dies that are 1.5 cm on a side and 1.0 cm on a side, assuming a defect density of 0.4 per cm² and α is 4. (05 Marks)
- d. Define module reliability and availability. (02 Marks)
- 2 a. Define data hazard. Explain how to minimize data hazard stall by forwarding technique. (07 Marks)
- b. List the four schemes used to reduce pipeline branch penalties. Illustrate delayed branch technique in detail. (08 Marks)
- c. List and explain five different ways of classifying exceptions in a computer system. (05 Marks)
- 3 a. Illustrate the basic compiler techniques for exposing instruction level parallelism for the following code :
for (i = 1000; i > 0; i = i - 1)
X[i] = X[i] + S ; (06 Marks)
- b. Explain 2-bit dynamic branch prediction scheme with a state transition diagram. (04 Marks)
- c. With a neat diagram, explain basic structure of a MIPS floating-point unit using Tomasulo's algorithm. Also define various fields of reservation station. (10 Marks)
- 4 a. Explain Branch Target Buffer (BTB), with a neat diagram. Also explain the steps involved in handling an instruction with a BTB. (12 Marks)
- b. Explain in detail, the issues in implementing advanced techniques for speculation. (08 Marks)

PART - B

- 5 a. Explain the different taxonomy of parallel architecture proposed by Flynn. (04 Marks)
- b. With a state transition diagram, explain a write invalidate, Cache Coherence Snooping Protocol for a write-back cache. (10 Marks)
- c. Explain the basic hardware primitives to implement synchronization in multiprocessor architectures. (06 Marks)
- 6 a. Describe the six basic cache optimization techniques. (10 Marks)
- b. Explain in detail the four common questions for the first level of the memory hierarchy. (10 Marks)

- 7 a. List the advanced optimization techniques of cache performance. Also explain in detail, compiler optimizations to reduce miss rate. (10 Marks)
- b. With a block diagram, explain DRAM technology. (05 Marks)
- c. Explain protection via virtual memory. (05 Marks)
- 8 a. Find all the true dependences, output dependences and antidependences and eliminate the output dependences and antidependences by renaming in the following code:
- ```
for (i = 1; i <= 100; i = i + 1) {
 Y[i] = X[i] / C; /*S1*/
 X[i] = X[i] + C; /*S2*/
 Z[i] = Y[i] + C; /*S3*/
 Y[i] = C - Y[i]; /*S4*/
}
```
- b. Explain software pipelining in detail. (08 Marks)
- c. Explain predicated instructions. (04 Marks)

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**Seventh Semester B.E. Degree Examination, Jan./Feb. 2021**  
**Java and J2EE**

Time: 3 hrs.

Max. Marks:100

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

**PART – A**

- 1 a. Explain the scope and life time of a variable used in Java. (04 Marks)
- b. Explain the importance and creation of 1D, 2D and multi-dimensional arrays in Java with the help of a Java program. (10 Marks)
- c. Write a Java program to accept the marks scored by N students in the subject 'JAVA and J2EE' and find the highest mark scored in that subject. (06 Marks)
- 2 a. Write short notes on:
  - i) 'this' keyword
  - ii) finalize()
  - iii) 'final' keyword. (08 Marks)
- b. Explain how nested class and inner classes are created in Java. (06 Marks)
- c. What is an applet? Write an applet program to accept two numbers and display the product of those two numbers. (06 Marks)
- 3 a. How to create multiple threads in JAVA? Explain with the help of a program. (06 Marks)
- b. What do you mean by 'Deadlock'? How to avoid deadlock condition in JAVA. (06 Marks)
- c. Display the different OS like Windows, Linux, Unix, Mac etc on the window layout created using AWT selection button. Write an event handling JAVA program which displays the OS name when it is selected through mouse. (08 Marks)
- 4 a. Explain any two key features of SWING. (05 Marks)
- b. Write a swing applet to create a simple calculator. (10 Marks)
- c. Explain how painting can be used in swing. (05 Marks)

**PART – B**

- 5 a. Compare and contrast four groups of JDBC drivers. (05 Marks)
- b. Explain the steps involved in database connectivity. Explain with the help of a program which also handles various exceptions while connecting to the database. (05 Marks)
- c. Explain the 3 types of 'statement' object which are used to execute the SQL query. Write a JAVA code which uses the statement object to execute a query. (10 Marks)
- 6 a. Write a Servlet program which accepts the temperature in Fahrenheit and converts it into celcius. [Hint:  $F = c * a/5 + 32$ ]. (08 Marks)
- b. Explain any 2 methods defined in servlet interface. (04 Marks)
- c. How cookie and session differ? Write a servlet program which demonstrates both. (08 Marks)
- 7 a. What is JSP? Explain the 3 types of JSP elements with an example each. (08 Marks)
- b. Define: Scriptlet. Explain how it could be useful in a JSP program. (04 Marks)
- c. What is the use of RMI? Explain with the use of client side and server side applications. (08 Marks)
- 8 a. What do you mean by EJB? Explain 3 types of EJBs in detail. (08 Marks)
- b. What is the use of JAR file? Explain in detail how it could be created and viewed. (06 Marks)
- c. Explain about the stateless session beans with the help of a program. (06 Marks)

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