R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

II B.Tech II Semester Regular April 2013

Computer Organization
(CSE)

Max. Marks: 70

Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a. Explain different types of Data representations? — 8M

   b. Give decimal equivalent of — 6M

      i) $(11010.111)_2$ ii) $(736.58)_8$ iii) $(3FA.8)_{16}$

2. With the help of flowchart explain in detail the instruction cycle? — 14M

3. a. Explain the two techniques used for design of control unit? — 7M

   b. Write about mapping process? — 7M

4. a. Explain decimal arithmetic unit in detail? — 7M

   b. Describe the providence for addition and subtraction of floating point numbers? — 7M

5. a. Briefly explain cache mapping techniques? — 7M

   b. Explain different levels of RAID? — 7M

6. a. Explain in details about I/O devices? — 6M

   b. With the help of block diagram explain the concept of DMA controller? — 8M

7. a. Explain in detail about arithmetic pipeline? — 7M

   b. Write short notes on array processors and its types? — 7M

8. a. What are multi processors? What are the characteristics of multiprocessors? — 7M

   b. Explain about inter processor arbitration? — 7M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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II B.Tech II Semester Regular April 2013

Database Management Systems
(Common to CSE & IT)

Max. Marks: 70   Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) Define DBMS? Explain Database system Applications.   7M

   b) What is a Data Model? Explain about a Relational Data Model.   7M

2. a) Construct an ER diagram for a bank Database. Bank maintains data about customers, their loans, their deposits, lockers. Determine the entities and relationships.   7M

   b) How composite attribute is modeled in E-R diagram. Explain with an example.   7M

3. a) What are integrity constraints? Define the terms Primary key constraint and Foreign key constraints with an example. How are these constraints expressed in SQL?   7M

   b) What is a View? How do views support logical data independence? How are views used for security? How are queries on views evaluated?   7M

4. a) Explain the following in SQL with examples.

      i)   Nested queries   ii) Correlated queries   7M

   b) Discuss about aggregation functions with examples.   7M

5. a) Define 1 NF, 2 NF, 3 NF and BCNF. What is the motivation for putting a relation in BCNF?   7M

   b) What are the problems related to decomposition. How these are rectified.   7M

6. a) Discuss about implementation of Atomicity and durability.   7M

   b) What are Save Points and Chained Transactions? Explain why save points and Chained Transactions are useful.   7M

7. a) Discuss about Time Stamp Based Protocols.   7M

   b) Write a detail note on Buffer Management.   7M

8. a) Explain Delete operation on B+ Tree Structure.   7M

   b) Explain Heap file with un clustered Hash Index.   7M

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R-11

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

II B.Tech II Semester Regular Examinations April – 2013

Design and Analysis of Algorithms
(Common to CSE & IT)

Max. Marks: 70

Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. a) Write an algorithm to find the largest of given n numbers. Show the working of the algorithm with a sample list of elements. Derive its time complexity.   8M

   b) Show that n^3 logn is $O(n^3)$.   6M

2. Explain the general method of divide and conquer method. Explain in detail about any sorting method that uses divide and conquer strategy for sorting a given list of elements. Write the procedure and derive it's time complexity.   14M

3. Write the general method of greedy strategy. What is knapsack problem? Explain how the knapsack problem can be solved by using greedy method, with an example. Write the algorithm and derive it's time complexity.   14M

4. With an example, explain in detail how the traveling salesperson problem can be solved using the dynamic programming method. Write the algorithm and derive the time complexity.   14M

5. Explain how the 8-queens problem can be solved using backtracking. Write the algorithm and derive the complexity.   14M

6. What is a binary tree? Explain about the preorder, postorder and inorder traversal techniques for binary trees, with one example for each. Write the procedures for each traversal and derive the time complexities.   14M

7. Explain how the 0/1 Knapsack problem can be solved by LCBB method. Write the algorithm, derive the time complexity and trace the algorithm for the following 0/1 Knapsack instances.

   i) N=5, (p1, p2, p3, p4, p5) = (10, 15, 6, 8, 4),

      (w1, w2, w3, w4, w5) = (4, 6, 3, 4, 2) and m = 12   14M

8. a) Write a detailed note on Class NP hard and NP complete problems.   8M

   b) Write non deterministic algorithms for Knapsack problem.   6M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

II B.Tech II Semester Regular April 2013

Environmental Science
(Common to ME & CSE)

Max. Marks: 70   Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1.	a)	Explain the importance of Environmental Education.	7M
	b)	Give a note brief account on components of environment.	7M
2.	a)	What are the causes and effects of deforestation? Suggest some conservation measures?	7M
	b)	Write about the various applications and advantages of alternate energy resources.	7M
3.	a)	Give a detailed account on land conservation measures.	7M
	b)	Write about the environmental effects of over exploitation of mineral resources. Suggest some conservation measures.	7M
4.		Define the term solid waste management and write about various methods of solid waste treatments in detail.	14M
5.	a)	Give a detailed account of the process of succession in forest ecosystem.	7M
	b)	Write a short note on food chain and food web with examples.	7M
6.	a)	What are the various causes for loss of biodiversity?	7M
	b)	Write about the values of biodiversity.	7M
7.	a)	What are the salient provisions of wild life act?	7M
	b)	Write about the greenhouse gases and their impact on global temperature.	7M
8.	a)	Write a note on role of information technology on human health and environment.	7M
	b)	Value education has an important effect on environmental conservation. Justify.	7M

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
(AUTONOMOUS)

II B.Tech II Semester Regular Examinations April – 2013

Formal Languages and Automata Theory
(CSE)

Max. Marks: 70   Time: 03 Hours

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Answer *any five* questions
All Questions carry equal marks (14 Marks each)

1. (a) Design a DFA for the following language. $L = \{0^m 1^n / m > 0 \text{ and } n > 1\}$.   7M

   (b) Design DFA which accepts language $L = \{0, 000, 00000 ...\}$ over $\{0\}$.   7M

2. (a) Find the minimum state finite automaton for the language that accepts the set of all strings not containing 101 as substring over the alphabet $\{0,1\}$.   7M

   (b) Design a Mealy machine that uses its state to remember the last symbol read and emits output 'y' whenever current input matches to previous one, and emits n otherwise.   7M

3. Find a Regular expression corresponding to each of the following subsets over $\{0,1\}^*$.

   (a) The set of all strings containing no three consecutive 0's.   7M

   (b) The set of all strings over $\{0, 1\}$ having even number of 0's & odd number of 1's.   7M

4. (a) Construct ϵ-NFA from right linear grammar

   $S \rightarrow 0A$, $A \rightarrow 10A/ \epsilon$ 7M

   (b) Define regular grammar. Find regular grammar for the following regular expression: $(a+b)^*bb(aa+bb)$ 7M

5. (a) Define GNF for a CFG. Find the grammar in GNF equivalent to the following grammar.   7M

   $E \rightarrow E+T/T$, $T \rightarrow T^*F/F$, $F \rightarrow (E)/a$

   (b) Show that the language $L = \{0^n 1^n 0^n / n \geq 1\}$ is not context free.   7M

6. (a) Design PDA generating $L = \{WCW^T / W \in \{a, b\}^*\}$ 7M

   (b) Let G be a CFG with the following productions   7M

        $S \rightarrow aBc$ $A \rightarrow abc$ $B \rightarrow aAb$

        $C \rightarrow AB$ $C \rightarrow c$

   Construct a PDA M such that the language generated by M and G are equivalent.

7. Give a Turing machine for the following:

   (a) That computes ones complement of a binary number   7M

   (b) $L = \{0^n 1^n 0^n | n > 0\}$ 7M

8. (a) What is decidability? Explain any two undecidable problems.   7M

   (b) Construct LR(0) items for the given grammar   7M

        $S' \rightarrow S$

        $S \rightarrow AS | a$

        $A \rightarrow Bb | b$

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ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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II B.Tech II Semester Regular Examinations April – 2013

Object Oriented Programming through JAVA
(Common to CSE & IT)

Max. Marks: 70   Time: 03 Hours

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Answer *any five* full questions
All Questions carry equal marks (14 Marks each)

1. a) What is byte code in java? Explain how the concept of pointers is implemented in java. **7M**

    b) An organization wants to transmit data securely over telephone, but they are concerned that their phone may be tapped. All the data are transmitted as five digit integers (numbers). The organization wants to encrypt (hide the actual five digit number by encoding) the actual five digit number so that it can be transmitted more securely. The encryption or encoding method is as follows: each digit in the number will be replaced by sum of all the digits modulo 10. Write a program which takes a series of five digit numbers (as input) and produce /print the encrypted or encoded numbers. **7M**

2. a) Write a program to demonstrate the use of *final* in inheritance **7M**

    b) Demonstrate the use of *super* where it can be used like *this* keyword **7M**

3. What is the purpose of *'packages'* in java? Discuss the various access specifiers in packages with suitable examples. **14M**

4. What is a thread? What are the two ways in which threads can be implemented? Explain with an example for each. **14M**

5. a) Define *Event Listener*. Explain ActionListener and Adjustment Listener **7M**

    b) Write a program to demonstrate *MouseListener* event. **7M**

6. a) Explain the applet lifecycle? What are the different types of applets **7M**

    b) What is a Layout Manager? Explain the different types of Layout Managers with suitable examples. **7M**

7. Write a swings program to demonstrate the implementation of JButton class and Radio Buttons **14M**

8. a) What is a Socket? Explain the various types of TCP socket classes **6M**

    b) What is Inet address? Explain various Factory and Instance methods with example **8M**

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