

Formal Languages and Automata Theory
(CSE)

Time: 3 hours

Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) Define Finite Automaton? Explain the ways to represent Finite Automaton. 7M
- b) Design a FA that accepts set of all strings in L such that integer number "a" when represented in a binary form is divisible by 3. 7M
2. a) Write the differences between DFA and NFA. 4M
- b) Design Mealy and Moore Machine for the input from $(0+1)^*$, if the input ends in 101, output is A; if the input ends in 110, output is B; otherwise C 10M
3. a) Construct Regular Expression for the FA:

δ	0	1
A	A	B
B	A	B

- b) Construct NFA for the Regular Expression $(1+0)0^*$ 7M
4. a) Write the procedure for converting Regular Grammar to Finite Automaton 4M
- b) Construct NFA for the following grammar: $S \rightarrow Ab/ab, A \rightarrow Ab/Bb, B \rightarrow Ba/a$ 10M
5. Convert the grammar $S \rightarrow ASA/aB, A \rightarrow B/S, B \rightarrow b/\epsilon$ in to Chomsky Normal Form. 14M
6. Write the equivalent CFG for the following PDA:

$\delta(q_0, b, z_0) = (q_0, zz_0)$
 $\delta(q_0, \epsilon, z_0) = (q_0, \epsilon)$
 $\delta(q_0, b, z) = (q_0, zz)$
 $\delta(q_0, a, z) = (q_1, z)$
 $\delta(q_1, b, z) = (q_1, \epsilon)$
 $\delta(q_1, a, z_0) = (q_0, z_0)$

 14M
7. Design a Turing Machine to find whether the given number is prime or not 14M
8. State whether the following grammar is LR(0) or not

$E \rightarrow E*B$
 $E \rightarrow E+B$
 $E \rightarrow B$
 $B \rightarrow 0$
 $B \rightarrow 1$

 14M

Code : 1G145

II B.Tech. II Semester Supplementary Examinations December, 2014

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

Time: 3 hours

Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) What is a constructor? Explain about constructor overloading? 7M
b) Write a program to convert the given temperature in Fahrenheit to Celsius using the following conversion formula $C = (F - 32)/1.8$ And display the values in a tabular form 7M
2. a) What are the differences between private, static and final variables? 7M
b) What is inheritance? Explain different types of inheritances? 7M
3. a) Write the similarities between class and interfaces? 7M
b) Explain about classes of java.util package? 7M
4. a) What is Synchronization? Why is thread Synchronization important for Muthithreaded programs 7M
b) What is the use of "Throw" "Throws" & "Finally"? Explain with examples for each. 7M
5. a) What is Event delegation model? Explain it? What are the benefits of it? 7M
b) Design a simple calculator using AWT? 7M
6. a) Explain the following methods of an applet: init(),start(), stop(),paint() 7M
b) Describe Flow and Border Layout managers 7M
7. a) Explain, in detail, the swing controls: TabbedPanes and ScrollPanes with suitable Java code examples 7M
b) What are the limitations of AWT? 7M
8. a) Discuss in brief about socket class with an example. 7M
b) Discuss about java.net package 7M

Code : 1G141

R11

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

II B.Tech. II Semester Supplementary Examinations December, 2014

Computer Organization
(Computer Science & Engineering)

Time: 3 hours

Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

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1. a) Explain Floating point representation of numbers in the ALU. 5M
b) Give the IEEE floating point representation for the following numbers
i)13 ii) -17 iii)-0.125 9M
2. a) Explain the functionality of 4-bit binary adder / subtractor. 8M
b) Explain the flowchart of Instruction cycle. 6M
3. Explain the Micro program sequencer for a Control memory. 14M
4. a) Explain the Booth's Multiplication Algorithm with example. 7M
b) With flow chart explain addition and subtraction of floating point numbers. 7M
5. a) Explain the following cache memory organizations :
i)Associative mapping ii)Directive mapping 8M
b) Explain the logical to physical address mapping in segmented-page memory management unit 6M
6. a) i) Analyze Block diagram of DMA controller 5M
ii) Draw and explain the diagram of DMA transfer in computer system 5M
b) Give the differences between DMA and IOP(I/O processor) 4M
7. a) Explain arithmetic pipe line in high speed computers 10M
b) Differentiate RISC and CISC characteristics 4M
8. a) Explain the crossbar switch organization 8M
b) Explain about loosely coupled and tightly coupled multi-processor systems 6M

II B.Tech. II Semester Supplementary Examinations December, 2014

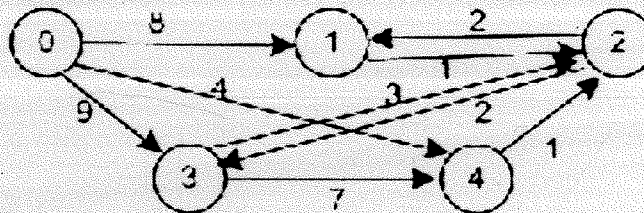
Design and Analysis of Algorithms
(Common to CSE & IT)

Time: 3 hours

Max Marks: 70

Answer any FIVE of the following
All questions carry equal marks (14 Marks each)

1. a) Experimentally compare the performance of SimpleUnion and SimpleFind with WeightedUnion and CollapsingFind. For this, generate a random sequence of union and find operations. 8M
 - b) Derive the Time and Space Complexity of the following programme.
Algorithm Pow (x, y)
{
 S=x
 For I : 1 to y
 S = S*x;
 Return (S);
}
- 6M
2. a) Distinguish between Quick sort and merge sort according to their time complexities (derive time complexities). 8M
 - b) State the Strassen's matrix multiplication and derive it's Time complexity? And How much Time reduction we can get over classical matrix multiplication? 6M
 3. a) State the problem of Job sequencing with dead-lines, and its time complexity? 6M
 - b) Find the shortest paths from source 0 to remaining all the nodes using Dijkshra's algorithm in a given graph.

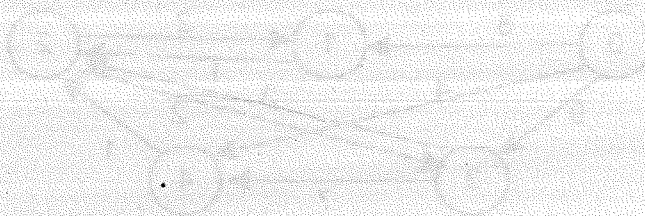


- 8M
4. a) State the recurrence relation for the matrix chain multiplication and what is the time complexity in Big oh (O) notation? 6M
 - b) Solve the following knapsack problem using dynamic programming technique for W=10.

Item	Weight	Value
1	6	\$30
2	3	\$14
3	4	\$16
4	2	\$9

8M

5. a) Write the solution space for 4-Queens problem? 6M
 b) Solve the following sum of subsets problem using back tracking technique.
 $S = \{3, 5, 6, 7\}$ and the sum of the subset $d=15$. ? 8M
6. a) Define the following terminology i) Articulation point ii) Bi connected components?
 With an example, explain how the Articulation points are undesirable feature in the graph theory? 7M
 b) For a sample graph, explain DFS and BFS graph traversal algorithms using suitable data structures? 7M
7. a) Compare and contrast LC Branch and Bound Solution, FIFO Branch and Bound solution for knapsack problem? 6M
 b) Write the algorithm for 0/1 knapsack problem using branch and bound technique. Trace the algorithm to find optimal solution to the knapsack instance of $n=4$, $m=15$, profit $(p_1, p_2, p_3, p_4) = (10, 10, 12, 18)$, weights $(w_1, w_2, w_3, w_4) = (2, 4, 6, 9)$? 8M
8. a) What is Boolean Satisfiability problem? Discuss with some suitable example. 6M
 b) State and prove Cook's theorem? 8M



Database Management Systems*(Common to CSE & IT)***Time: 3 hours****Max Marks: 70**

*Answer any FIVE of the following
All questions carry equal marks (14 Marks each)*

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1. a) Explain various levels of data abstraction and their benefits. 7M
b) Explain Architecture of database System in detail. 7M
2. a) Draw ER diagram for college environment incorporating all the ER notations with explanation. 7M
b) Explain weak entity, strong entity, derived attribute and specialization. 7M
3. a) Discuss various integrity constraints with suitable example. 7M
b) Explain logical data base design. 7M
4. a) Explain group by, having and order by clauses with suitable examples. 7M
b) Consider the relation **Employee[empno, ename, department, salary]**
 - i) List out the details of all employees working for 'Sales' and 'Production' departments using UNION operation. Order the employees in descending order of their salaries.
 - ii) Using self join, display the details of all employees who are working in the same department of 'Venkateswarlu' 7M
5. a) Explain 2NF and 3NF with example. 7M
b) Write about Functional dependency and Multi valued dependency. 7M
6. a) Explain the remedial measures to be taken to avoid the anomalies of concurrent execution of transactions. 7M
b) Write about transaction Serializability. 7M
7. a) Explain Lock based protocol in concurrency control. 7M
b) Discuss Log based recovery system. 7M
8. a) Explain ISAM with sample data. 7M
b) Briefly explain various techniques for faster accessing of data 7M

Code : 1GC43

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II B.Tech. II Semester Supplementary Examinations Dec. 2014

Environmental Science
(Common to CIVIL, ME & CSE)

Time: 3 hours

Max Marks: 70

*Answer any FIVE of the following
All questions carry equal marks (14 Marks each)*

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1. a) Define Environment? What are the various components of environment? 7M
b) What is the need for studying environmental issues? 7M
2. a) What are the major causes of Deforestation? Briefly explain the effects of deforestation on environment? 7M
b) Write an account of the growing energy needs with special reference to India. 7M
3. a) Discuss the ill effects of the use of chemical fertilizers and pesticides in agriculture. 7M
b) Discuss the impact of over exploitation of minerals on environment. 7M
4. a) What are the main sources of marine pollution? Discuss their effects and suggest methods of control. 7M
b) Write a note on urban solid waste management practices. 7M
5. a) Write short note on grass land and aquatic eco system? 7M
b) Write notes on ecological pyramids. 7M
6. a) What are the various threats leading to loss of biodiversity? 7M
b) Discuss the various strategies of in-situ conservation of biodiversity. 7M
7. a) Discuss the methods and advantages of rain water harvesting. 7M
b) Explain how global warming is affecting our planet. 7M
8. What do you mean by population explosion? What are its effects on environment and other human aspects? 14
