

Code : 1G144

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET  
(AUTONOMOUS)**II B.Tech. II Semester Regular Examinations, June 2014****Formal Languages and Automata Theory**

( Computer Science &amp; Engineering )

**Time: 3 hours****Max Marks: 70***Answer any FIVE of the following  
All questions carry equal marks (14 Marks each)*

\* \* \* \* \*

1. a) What is Chomsky Hierarchy of Grammars 7M  
 b) Explain types of grammars along with corresponding recognizers. 7M
2. a) What is NFA? Write the procedure to convert NFA to DFA? 7M  
 b) Convert the following NFA to DFA

$\delta$	0	1
$\rightarrow q_0$	{q1,q2}	{q0}
q1	{q1,q2}	$\Phi$
*q2	q1	{q1,q2}

7M

3. a) State Pumping Lemma. 4M  
 b) State whether  $L = \{a^n b^n / n > 0\}$  is regular 10M
4. Find the Regular Expression for the following FA

$\delta$	0	1
$\rightarrow A$	B	C
B	A	C
*C	B	A

14M

5. a) Write the procedure to eliminate ambiguity. 5M  
 b) Test whether the grammar  $S \rightarrow iCtS/iCtSeS/a$ ,  $C \rightarrow b$  is ambiguous or not. If it is ambiguous, write equivalent unambiguous grammar. 9M
6. Define Push Down Automata. Design PDA for the Language  $L = \{wcw^r / w \in (a+b)^*\}$  14M
7. Define Turing Machine. Design a Turing Machine that accepts the strings  $ab^*$  or  $ba^*$  14M
8. State whether the following grammar is LR(0) grammar or not

 $A \rightarrow aAa/B$  $B \rightarrow b$ 

14M

\*\*\*

Code : 1G145

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET  
(AUTONOMOUS)**II B.Tech. II Semester Regular Examinations, June 2014****Object Oriented Programming through JAVA**

(Common to CSE &amp; IT)

**Time: 3 hours****Max Marks: 70***Answer any FIVE of the following  
All questions carry equal marks (14 Marks each)*

\* \* \* \* \*

1. a) What is static member? When do we declare a member as static? In what way it is different from final member? Can we declare a member as static and final? With an example explain the concepts. 7M
- b) What is byte code in Java? Why Java does not support pointers? Explain 7M
2. a) What is single inheritance? Explain with an example? 7M
- b) What is abstract class? Explain with an example? 7M
3. a) Write a runtime polymorphism program in java using interface reference variables? 7M
- b) What is a package? How do create a package? Explain about access protection in packages? 7M
4. a) What is a thread? Explain the concept of a multithreading programming. 7M
- b) Describe the various java's built-in exceptions. 7M
5. a) With help of simple java program explain how you handle mouse related events 7M
- b) What is the functionality supported by java related to drawing arcs 7M
6. a) What is an applet? What are the differences between local and remote applets? 7M
- b) What is the task performed by Layout manager? Explain different layout managers 7M
7. a) Discuss MVC Architecture. 7M
- b) Difference between Applet and JApplet. Write short note on JFrame and JComponent 7M
8. a) What are the various networking classes and interfaces present in java? Explain. 7M
- b) Discuss about multiple clients. 7M

\*\*\*

Code : 1G141

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET  
(AUTONOMOUS)**II B.Tech. II Semester Regular Examinations, June 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)*

\* \* \* \* \*

1. a) Add the following numbers using 2's complement form
  - i) -6, 13    ii) 6, -13    iii) -6, -13 9M
  - b) Discuss about the excess-3 code and weighted code 5M
2. a) Explain the functionality of 4-bit adder and subtractor 8M
  - b) Write the Micro Instructions for the following
    - i) ADD to AC    ii) LOAD to AC    iii) BSA 6M
3. Explain the Micro program sequencer for a Control memory 14M
4. a) Show the step-by-step multiplication process of (-3) and (-7) using Booths Algorithm 7M
  - b) Explain Decimal addition and subtraction using one stage decimal arithmetic unit 7M
5. a) Discuss about memory protection. 4M
  - b) Explain the following cache memory organizations :
    - i) Associative mapping    ii) Directive mapping 10M
6. a) Explain the CPU and IOP (I/O Processor) communication. 12M
  - b) What are the differences between DMA and IOP? 2M
7. a) Explain the instruction pipeline in High speed computers 9M
  - b) Briefly explain the array processors 5M
8. a) Explain the multi-stage switching networks 10M
  - b) What is meant by polling? 4M

\*\*\*

Code : 1G142

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET  
(AUTONOMOUS)**II B.Tech. II Semester Regular Examinations, June 2014****Database Management Systems**

(Common to CSE &amp; IT)

**Time: 3 hours****Max Marks: 70***Answer any FIVE of the following  
All questions carry equal marks (14 Marks each)*

\* \* \* \* \*

1. a) Differentiate data base System and file System. Discuss the benefits of Data base system relating to practical applications. 7M
- b) Explain Network, Relational and ER models diagrammatically. 7M
2. a) Draw ER diagram for hospital environment incorporating all the ER notations with explanation. 7M
- b) Explain generalization and aggregation with simple example. 7M
3. a) Discuss referential integrity constraint with suitable example. 7M
- b) Explain views and their benefits. Also give explanation for the following
  - i) Can views be altered?
  - ii) Can view be updated?
  - iii) Can view be created on another view? 7M
4. a) Explain aggregate functions with examples. 7M
- b) Consider the relation **Employee[empno, ename, department, salary]**
  - i) List out the details of top five high salary drawn employees
  - ii) List out the details of the employees who are drawing greater salary than 'Srinivas' 7M
5. a) Explain 2NF and BCNF with examples. 7M
- b) Write about De-normalization and the situations to opt it. 7M
6. a) Explain ACID properties of transaction. 7M
- b) Give example for Updation and Insertion anomaly. 7M
7. a) Write about Two phase locking protocol. 7M
- b) Reasons for Deadlock. Discuss Deadlock avoidance, prevention and detection. 7M
8. a) Explain various file organization techniques in detail. 7M
- b) Discuss B+Trees with suitable example 7M

\*\*\*

Code : 1G143

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

**II B.Tech. II Semester Regular Examinations, June 2014**

**Design and Analysis of Algorithms**

(Common to CSE & IT)

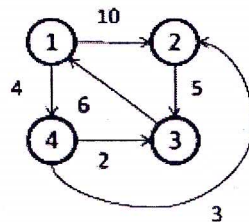
Time: 3 hours

Max Marks: 70

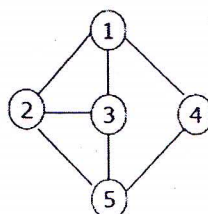
*Answer any FIVE of the following  
All questions carry equal marks (14 Marks each)*

\* \* \* \* \*

1. a) Write the asymptotic notations, discuss the general relation between time and space complexities? 8M  
 b) Find the 'O' notation of the following functions 6M
  - i)  $5n^2 - 6n$
  - ii)  $n!$
  - iii)  $n^2 + 2n + \log(n) + n/\log(n)$
2. a) Describe the two cases, where the Quick sort Algorithm will give Best performance and worst performance respectively, with suitable example? 8M  
 b) How many times the following list of elements will get divided to find out element '92' using Binary search. 36, 42, 54, 62, 78, 89, 92, 100. 6M
3. a) Discuss and Derive the Time Complexities of the prims and Kruskal Algorithms? 6M  
 b) Find the optimal solution for following knapsack instance. 8M  
 $n = 5, (W_1 W_2 W_3 W_4 W_5) = (4, 8, 2, 6, 1), (P_1 P_2 P_3 P_4 P_5) = (12, 32, 40, 30, 50)$   
 Knapsack size  $m = 10$ ?
4. a) In what way Dynamic Programming can out performs the Greedy method? Compare and Contrast Dynamic and Greedy method. 5M  
 b) Find all pairs shortest paths in the following graph. 9M



5. a) Distinguish the solutions for Eight Queens problem using backtracking and dynamic programming? 6M  
 b) Consider the following graph for coloring problem. Find the chromatic number and show the solution space. 8M





6. a) Write the Algorithms for DFS and BFS graph traversal methods and Analyze the time complexities? 8M
- b) State the Relation between spanning trees and Graph traversal Algorithms (DFS, BFS) for any sample Graph? 6M
7. a) What do you mean by bounding? Explain how these bound are useful in branch and bound? 6M
- b) Draw the portion of state space tree generated by LC Branch and Bound for the knapsack instances:  
 $n=5, (P_1, P_2, \dots, P_5) = (10, 15, 6, 8, 4), (W_1, W_2, \dots, W_5) = (4, 6, 3, 4, 2)$  and  $M=12$ . 8M
8. a) Define P and NP class problems with the help of examples. 6
- b) Describe the concept of non-deterministic algorithm. Give non-deterministic algorithm for knapsack problem. 8M

\*\*\*

Code : 1GC43

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

II B.Tech. II Semester Regular Examinations, June 2014

**Environment Science**

(Common to Civil, ME &amp; CSE )

Time: 3 hours

Max Marks: 70

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

\* \* \* \* \*

- |       |  |     |
|-------|--|-----|
| 1. a) | What is the scope and importance of environmental studies?   | 7M  |
| b)    | Explain the multidisciplinary nature of environmental science.   | 7M  |
| 2. a) | Write an account of the use and over utilization of surface and ground water?                          | 7M  |
| b)    | Discuss various non-renewable energy sources?  | 7M  |
| 3. a) | What are the environmental hazards associated with mineral extraction?                                 | 7M  |
| b)    | Briefly discuss the equitable use of resources for sustainable development                             | 7M  |
| 4. a) | What are various air pollutants? Discuss their effects on vegetation and human being?                  | 7M  |
| b)    | Write a note on urban solid waste management practices?  | 7M  |
| 5. a) | What is ecosystem? Describe the structure and functions of ecosystem.                                  | 7M  |
| b)    | Write notes on ecological pyramids?  | 7M  |
| 6. a) | Write notes on the value of biodiversity?  | 7M  |
| b)    | Describe the various methods of ex-situ conservation of biodiversity?                                  | 7M  |
| 7. a) | Write a brief note on nuclear accidents?   | 7M  |
| b)    | Discuss the Environment (Protection) Act and Wild Life (Protection) Act?                               | 7M  |
| 8     | What do you mean by population explosion? What are its effects on environment and other human aspects? | 14M |

\*\*\*