

Code : 1P3112

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

M.Tech. I Semester Regular Examinations, February 2014

Advanced Data structures and Algorithms

(CSE)

Time: 3 hours

Max Marks: 60

*Answer any FIVE of the following
All questions carry equal marks (12 Marks each)*

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1. a) How can a data member be declared as a static member? What exactly is its impact? Explain with an example. 4M
- b) What are friend functions? With an example explain the working of friend functions. 4M
- c) Give a note on exception handling in C++. 4M
2. a) Illustrate the overloading of ++ and -- operators with examples. 6M
- b) How polymorphism is achieved at compile time and run time? Write an example of a program that uses polymorphism. 6M
3. a) What is amortized analysis? Explain different methods in amortized analysis with examples. 6M
- b) Discuss the implementation of queue ADT using template classes in C++. 6M
4. a) Show the result of inserting the keys: 10111101, 00000010, 10011011, 10111110, 01111111, 01010001, 10010110, 00001011, 11001111, 10011110, 11011011, 00101011, 01100001, 11110000, 01101111 into an initially empty extendible hashing data structure with $m=4$. 6M
- b) Discuss insertion and deletion operations on priority queues with suitable examples. 6M
5. a) Explain how to compute the height of an AVL tree with an algorithm. 5M
- b) Discuss insertion and deletion operations in B-trees. 7M
6. a) Write an algorithm for Quick Sort and trace the algorithm for the following numbers: 15, 52, 4, 33, 67, 9, 47, 5, 2. 6M
- b) Illustrate basic graph traversal Techniques with examples. Also mention the difference between those techniques. 6M
7. a) Write and explain Prim's algorithm for finding minimum cost spanning tree. 6M
- b) Explain the method of solving the knapsack problem using dynamic programming approach. Solve the knapsack problem with $n=3$, $m=20$, $(p_1, p_2, p_3)=(25, 24, 15)$ and $(w_1, w_2, w_3)=(18, 15, 10)$. 6M
8. a) Describe how Eight Queen's problem can be solved using back tracking. Write the algorithm. 6M
- b) Discuss FIFO branch and bound solution with an example. 6M

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M.Tech. I Semester Regular Examinations, February 2014

Advanced Software Engineering
(CSE)

Max. Marks: 60

Time: 03 Hours

Answer *any five* questions

All Questions carry equal marks (12 Marks each)

1. a) What are the challenges for the software engineers with the changing nature of software? 6M
- b) Mention the differences between perspective and specialized process models? 6M
2. What is an agile process? Explain Extreme Programming (XP) and Adaptive Software Development (ASD) agile models with their framework activities. 12M
3. Explain risk driven and safety specification for a critical system. 12M
4. Explain in detail various design patterns. 12M
5. a) Explain the process of system testing? 6M
- b) Discuss the concept of software maintenance process. 6M
6. Explain aspect oriented software engineering approach with the help of an example. 12M
7. Explain the need for software measurement and describe the metrics. 12M
8. How do you observe software engineering trends and explain the tools that address technology trends? 12M

Code : 1P3111

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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M.Tech. I Semester Regular Examinations, February 2014

FOUNDATION OF COMPUTING

(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

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1. a) Obtain the PDNF of the following formula $P \vee (\neg P \rightarrow (Q \vee (\neg Q \rightarrow R)))$ 5M
- b) State Inference Rules 2M
- c) By indirect proof method, show that $P \rightarrow Q, Q \rightarrow R, P \vee R \Rightarrow R$ 5M
2. a) Write Warshall's algorithm and trace the algorithm by taking a suitable example. 6M
- b) Define the following terms
 - i) Partial order relation 2M
 - ii) Poset 2M
 - iii) Hasse Diagram 2M
3. a) Write Depth First Search algorithm. Trace DFS by taking suitable example. 6M
- b) State and prove Euler's formula for planar graphs. 6M
4. a) What is NFA? Write the procedure to convert NFA to DFA. 6M
- b) What is Moore machine? Explain with suitable example. 6M
5. a) What is Arden's Theorem? 4M
- b) How to construct a regular expression for a given DFA. 4M
- c) Construct DFA for the regular expression $(10+0)^*1(10(10+0)^*1+1)^*$ over alphabet $\Sigma = \{0,1\}$. 4M
6. a) Define Greibach Normal Form (GNF) for context Free Language. 2M
- b) Convert the following Context Free Grammar to GNF.

$$S \rightarrow AA / a$$

$$A \rightarrow SS/b$$
 5M
- c) Construct the CFG for the regular expression $\{0^m1^n \mid m,n=0\}$ 5M
7. a) Define Push Down Automata. 4M
- b) Design a Push Down Automata which accepts equal number of a's and b's over $\Sigma = \{a,b\}$. 8M
8. a) Define Linear Bound Automata 4M
- b) Design a Turing Machine to find whether the given number is prime or not. 8M

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M.Tech. I Semester Regular Examinations, February 2014

***Advanced Computer Architecture
(CSE)*****Max. Marks: 60****Time: 03 Hours**

Answer any five questions**All Questions carry equal marks (12 Marks each)**

1. With the help of a neat sketch, explain the different types of system interconnection architectures. 12M
2. a) Discuss in detail about the inclusion, coherence and locality properties. 06M
b) Write a detailed note on harmonic mean performance. 06M
3. a) Explain about the throughput and efficiency in timer pipeline processors 06M
b) Give brief description about multifunctional arithmetic pipelines. 06M
4. Explain in detail about the routing in omega and butterfly networks. 12M
5. a) Explain briefly about the CM-5 network architecture 06M
b) Write short notes on multi pipeline networking. 06M
6. a) What is prefetching. Explain it in detail. 06M
b) Describe in detail about the multithreading. 06M
7. a) Define operand forwarding. Explain it in detail. 06M
b) Explain about branch prediction. 06M
8. What are the different forms of parallelism? Explain them in briefly. 12M

Code : 1P3114

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES :: RAJAMPET
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M.Tech. I Semester Regular Examinations, February 2014

ADVANCED COMPUTER NETWORKS
(CSE)

Time: 3 hours

Max Marks: 60

Answer any FIVE of the following
All questions carry equal marks (12 Marks each)

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1. a) What are the different types of delays experienced by the packet along the path? Explain?
b) Compare TCP/IP model with OSI model?
2. a) Explain and compare various Ethernet technologies?
b) What are the functions of link layer? Describe them briefly?
3. a) Discuss about Least-cost Routing algorithms?
b) Differentiate IPV4 and IPV6 protocols?
4. a) Explain TCP congestion control mechanism?
b) Explain the characteristics of SMTP protocol?
5. a) Compare and contrast Infrastructure Vs Ad-Hoc Networks?
b) Explain the registration and Tunneling functions of mobile IP?
6. a) Explain the functions of basic optical networking devices?
b) Write short notes on optical routers?
7. a) What are the protocols that supports multimedia networking? Explain?
b) Discuss briefly about VPN?
8. a) What are the routing protocols for Ad-hoc networks?
b) Write short notes on wireless sensor networks?

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M.Tech. I Semester Regular Examinations, February 2014

***Advanced Databases
(CSE)***

Max. Marks: 60

Time: 03 Hours

Answer *any five* questions

All Questions carry equal marks (12 Marks each)

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| 1. a) | Define Distributed Data Base system and Explain with an Example. | 6M |
| b) | Explain the integrity Constraints in Distributed data Base. | 6M |
| 2. a) | Define Allocation & Explain allocation problem in Distributed Data Base Design | 6M |
| b) | Explain Top-Down Design Process of Distributed Data base Design With neat Diagram. | 6M |
| 3. | Explain Four(4) Characteristics for Centralized and Distributed query Process. | 12M |
| 4. | Explain about dynamic Query Optimization with an Algorithm. | 12M |
| 5. a) | Define Transaction with help of an example. | 6M |
| b) | Explain any Two (2) Properties of Transactions. | 6M |
| 6. a) | Define reliability and availability in Distributed DBMS. | 4M |
| b) | Explain the Functional Architecture of parallel Distributed Data Base Systems | 8M |
| 7. a) | Define the terms Object, types and Classes of Distributed Object DBMS | 4M |
| b) | Explain Class partition algorithm for Object Distributed Design. | 8M |
| 8. a) | Explain the various similarities & Differences between OODBMS & ORDBMS. | 6M |
| b) | Write Short notes on Persistence Programming Languages. | 6M |
