NCSL403

G. H. Raisoni College of Engineering, Nagpur

(An Autonomous Institution under UGC act 1956)

Sixth Semester B.E. (Computer Science & Engineering)

Winter Examination - 2013

Design and Analysis of Algorithm

Time: Three hr.] **[Max. Marks: 80**

Instructions to Candidate:

1) Three questions from each section are compulsory.
2) Assume suitable data wherever necessary.
3) Due credit will be given to neatness and adequate dimensions.
4) Illustrate your answer wherever necessary with the help of neat sketches.

SECTION - A

1.	(a)	What is an algorithm? Explain the features of algorithm.	5
	(b)	Explain asymptotic notations with one example of each bound.	8
2.	(a)	Explain the Time complexity and space complexity with suitable example.	5
	(b)	What is amortized analysis? Explain its types of method and application?	8
3.	(a)	Write the rules of Master Method? Solve using Master Method (i) $T(n)=4T(n/2)+n$ (ii) $T(n)=7T(n/2)+n2$	8

(b) Solve using substitution method $T(n)=2T(n/2)+n$ 5

4. (a) Explain Floyd-Warshall algorithm to find all pair shortest path 8

(b) Explain Divide and Conquer strategy with suitable example. 5

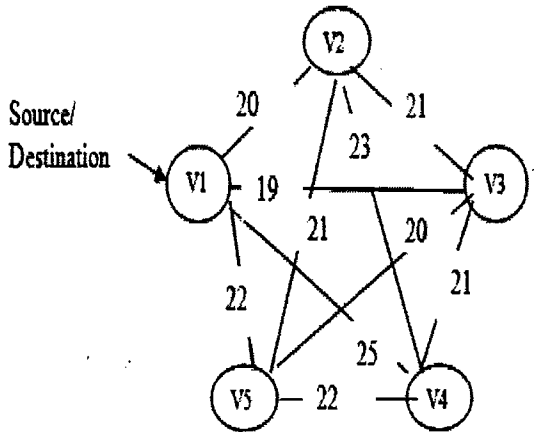
5. (a) What is differences between the greedy and dynamic strategies 6

(b) Write an algorithm and calculate complexity for Merge sort. 8

SECTION - B

6. (a) Compare and contrast Prims and Kruskal's Algorithm with the help of example. 5

(b) Solve using Travelling Sales Man Problem 8



7. (a) What is dynamic programming? Discuss the element of dynamic programming. 8

(b) Explain the BFS and DFS with suitable example. 6

8. (a) What do you mean by NP-complete and NP-Hard? Explain in brief. 8

(b) Write note on Graph coloring 5

9. (a) Explain Algorithm of Matrix Chain Multiplication and Solve <5,4,6,2,7> 8

(b) Explain LCS with example 5

10. Write Short Note on 13

(i) 8 Queens problem

(ii) Knapsack problem

(iii) Bellman Ford Algorithm

NCSL207

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Sixth Semester B.E. (Computer Science & Engineering)

Winter Examination - 2013

Database Management System

Time: 3.hrs.] [Max. Marks: 80

Instructions to Candidate:

1) All questions carry marks as indicated.
2) Answer **THREE** questions from **Section A** and **THREE** questions from **Section B.**
3) Assume suitable data wherever necessary.
4) Due credit will be given to neatness and adequate dimensions.
5) Illustrate your answer wherever necessary with the help of neat sketches.

SECTION - A

1. (a) Draw the architecture of DBMS.Also explain the various levels and their functions. 7

   (b) Explain Entity-Relationship model with an example. 6

2. (a) Discuss various JOIN operations defined in Relational Algebra. 7

   (b) Define integrity constraints. Explain different types of integrity constraints. 7

3. (a) Create a table STORAGE (Sno,Company,Items code, Item name, price) for each of the query below give an expression in SQL: 6

   i) Display the record whose item code is 20.
   ii) Display all the names of items starting with 'S'.
   iii) Count the total number of products of type "soap"

   (b) What are the various operators used in relational algebra ? 7

4. Define 1 NF, 2 NF, 3 NF, 4 NF, BCNF and state why 4 NF is more desirable than BCNF. 13

5. (a) Explain difference between B-tree and B+tree. 5

   (b) Write short notes on :- 8

   i) Serial files
   ii) Sequential files
   iii) Index. Sequential files
   iv) Direct files

SECTION - B

6. (a) Explain the states of a Transaction with the help of state-Transaction Diagram. 7

   (b) Most implementations of database system use strict two-phase locking. Suggest three reasons for the popularity of this protocol. 7

7. (a) What is query processing? What are the joint strategies in join operations? 7

   (b) Explain lock based protocol. 6

8. (a) What is meant by term heuristic optimization? 6

   (b) Discuss the main heuristics that are applied during query optimization. 7

9. (a) Describe three phase of ARIES recovery method. 7

   (b) What are deadlocks? How is deadlock detection and prevention achieved in DBMS? 6

10. (a) Explain the following:- 6

    (i)Conflict serializability

    (ii)View serializability

    (b) Explain in brief about log base recovery. 7

NCSL 404

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Sixth Semester B.E. (Computer Science & Engineering)

Winter Examination - 2013

COMPUTER NETWORKS

Time: 3 hours] **[Max. Marks: 80**

Instructions to Candidate:

1) All questions carry marks as indicated.
2) Answer **THREE** questions from **Section A** and **THREE** questions from **Section B.**
3) Assume suitable data wherever necessary.
4) Due credit will be given to neatness and adequate dimensions.
5) Illustrate your answer wherever necessary with the help of neat sketches.

SECTION -A

1.	(a)	Explain main functions of 7 layers of OSI model.	7
	(b)	Write the difference between TCP & UDP.	3
	(c)	What is Multiplexing? Explain TDM multiplexing technique.	4
2.	(a)	Differentiate between Circuit switching & Packet switching.	4
	(b)	What is Congestion? Explain General Principle of Congestion Control.	5

(c) Compare CSMA/CD with CSMA/CA. 4

3. (a) Explain the different Framing methods used in Data Link Layer with example. 6

(b) The transport Layer Service is similar to Network Layer Service, Why are there two distinct layers? 4

(c) Explain CIDR (Classless Inter Domain Routing). 3

4. (a) Draw and explain HDLC frame format. 5

(b) Explain the following protocols. **(Any Two)** 8
(i) Stop and Wait
(ii) Go back n
(iii) Selective Repeat.

5. (a) Write a short note on : **(Any Two)** 10
(i) Flooding
(ii) DVR
(iii) Link state routing

(b) What is the minimum overhead to send an IP packet using PPP? Explain. 3

SECTION - B

6. (a) Explain the Distance Vector Routing Protocol. 8

(b) Explain the classes of IP addresses in detail. 6

7. (a) Explain ARP and RARP protocols. Also state the position of ARP and RARP protocols in TCP/IP layers. 8

(b) Write a short note on Three way Handshake 5

8. (a) Compare and Contrast between IEEE 802.3, 802.4 and 802.5 LAN standards. 8

(b) Write a short note on FDDI. 5

9. (a) Which are Transport Service Primitives? 4

(b) Explain BGP- Exterior Gateway Routing Protocol 5

(c) Which are goals of Network layer to provide services to the transport layer. 4

10 (a) Explain: 3
(i) Unacknowledged connectionless service
(ii) Acknowledged connectionless service
(iii) Acknowledged connection-oriented service

(b) Write a short note on: **(Any Two)** 10
(i) ATM
(ii) ISDN
(iii) Bluetooth Piconet

NECL320

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Sixth Semester B.E. (Computer Science & Engineering)

Winter Examination - 2013

Microprocessor & Interfacing

Time: 3 hr.] **[Max. Marks: 80**

Instructions to Candidate:

1) All questions carry marks as indicated.
2) Answer **THREE** questions from **Section A** and **THREE** questions from **Section B.**
3) Assume suitable data wherever necessary.
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5) Illustrate your answer wherever necessary with the help of neat sketches.

SECTION - A

1. (a) Write a program to exchange the contents of memory location 2000 H with the contents at memory location 2500 H. 5

   (b) Explain the control and status signals used by 8085 MPU. 4

   (c) What do you mean by one byte, two byte or three byte instruction? Give 2 examples of each. 5

2. (a) Explain the sequence of a program execution when a subroutine is called & executed. 5

(b) Write an algorithm and assembly program to find the square root of a 16 bit number using shift and subtract method. 5

(c) Demonstrate the uses of instructions DAD, PCHL. 3

3. (a) Draw a timing diagram for complete execution of LDA instruction in microprocessor 8085. 7

(b) Describe a scheme to demultiplex the multiplexed AD0-AD7 bus of 8085 CPU. 6

4. (a) Explain the memory mapped i/o addressing scheme. 7

(b) What is Interrupt? Explain enabling, disabling and masking of interrupts with examples. 6

5. (a) What is PPI? Draw and explain the internal block diagram for 8255. 7

(b) Explain the process of the Direct Memory Access (DMA) and the functions of various elements of the 8237. 6

SECTION - B

6. (a) Explain the block diagram of the 8279 Keyboard/Display interface and its operations. 7

(b) What is stepper motor? Explain how to interface stepper motor with microprocessor 8085. 7

7. (a) Distinguish between Non-Programmable & Programmable I/O Devices 5

(b) Give the format of PSW register of 8051. 5

(c) List the addressing modes of 8051 with example. 3

8. (a) Compare , 8
(i) Serial and parallel communication.
(ii) Synchronous and asynchronous mode of data transfer.
(iii) RS-232C serial I/O and RS-422A standard.

(b) Explain bit addressable memory in 8051. 5

9. (a) Explain the block diagram and the functions of each block of the 8251 USART (Programmable Communication Interface). 7

(b) Write an 8051 assembly program to multiply two 16 bit numbers, using shift left and add algorithm 6

10 (a) Describe the architecture of 8051 with a neat diagram. 7

(b) Give a short note on: 6
(i) Memory Interfacing
(ii) Address Decoding
(iii)I/O Interfacing

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Sixth Semester B. E. (Computer Science & Engineering)

Winter Examination - 2013

Software Engineering & Project Management

Time:03.hr.] **[Max. Marks: 80.**

Instructions to Candidate:

1) All questions carry marks as indicated.
2) Answer **THREE** questions from **Section A** and **THREE** questions from **Section B.**
3) Assume suitable data wherever necessary.
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Section - A

1. a) Why Software Engineering is called as Layered Technology? 3

   b) Explain Common process framework in detail? 4

   c) Define Software. Describe the important characteristics of a software product that Differentiates it from any other product. 6

2. a) Explain Incremental sequential model. What are the drawbacks of this model? 6

   b) Why Size Oriented metrics is not universally accepted as the best way to measure the process of software development? 7

3. a) What are the purposes of Data Flow diagrams, Entity-Relationship diagrams? Give an example diagram of each. 7

   b) What is project planning? Explain the objective of software project planning in detail 6

4. a) Explain the specification principles stated by Balzer and Goodman. 6

   b) What is meant by software metrics? Explain the significance of data structure metrics during testing. 7

5. Write short note on **(Any Three):** 14
   a) Quality function deployment.
   b) COCOMO model.
   c) Risk analysis
   d) SRS Document

Section - B

6. a) State the difference between an object used in OOA and object used during data modeling. 6

   b) What is object oriented analysis Explain the five methods of object oriented analysis. 7

7. List and explain different types of testing done during the testing phase. 13

8. a) Discuss the software design fundamentals In detail. 6

   b) Explain why a good design objective in software engineering should have high cohesion & low coupling. 7

9. a) What are various activities involved in software quality Assurance (SQA). 7

   b) Explain how the program structure can be manipulated according to the set of design heuristics for effective modularity. 6

10. Write short note on **(Any Three):** 14

    a) Cyclomatic Complexity

    b) Reverse Engineering.

    c) Functional Independence

    d) Forward Engineering.