



Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, May 2010
(2008 Scheme)**

Branch : INFORMATION TECHNOLOGY

08.406 : Data Base Design (F)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. What are the responsibilities of the DBA and the database designers ?
2. What are database utilities ? List the functions that the utilities perform.
3. What is meant by a safe expression in relational calculus ?
4. How does SQL implement the entity integrity and referential integrity constraints of the relational data model ? Explain with an example.
5. Explain the concept of transitive dependency and explain how this concept is used to define 3NF.
6. What is a dangling tuple ? Give an example.
7. Explain the desirable properties of transactions.
8. How does Thomas's write rule modify the check for the write-item (X) operation ?
9. Explain No-undo/Redo algorithm.
10. Draw the state transition diagram illustrating the states for transaction execution. **(10×4=40 Marks)**

P.T.O.



PART – B

Answer **any one** question from **each** Module.

Module – I

11. With a neat diagram, explain the component modules of a DBMS and their interactions. 20

OR

12. a) Construct an ER diagram (including important attributes) for a car insurance database that includes data about car owners, cars, accidents, drivers involved in accidents and injured drivers and/or passengers. Note that any customer (car owner) can insure many cars, each car may have different drivers at different times and accidents typically involve one or more cars. 10

- b) Consider the following relational Schema :

Employee (empno, name, office, age)

Books (isbn, title, authors, publisher)

Loan (empno, isbn, data)

Write the following queries in relational algebra

- i) Find the names of employees who have borrowed a book published by McGraw - Hill.
- ii) Find the names of employees who have borrowed all books published by McGraw - Hill.
- iii) Find the names of employees who have borrowed more than five different books published by McGraw - Hill.
- iv) For each publisher, find the names of employees who have borrowed more than five books of that publisher. 10



Module – II

13. a) Consider the following tables :
- Works (Pname, Cname, Salary)
 - Lives (Pname, Street, City)
 - Located - IN (Cname, City)
 - Manager (Pname, Mgrname)
- where Pname = Person name, Cname = Company name, and Mgrname = Manager Name.
- Write the SQL for the following
- i) List the names of the people who work for the company 'Wipro' along with the cities they live in.
 - ii) Find the names of the persons who live and work in the same city.
 - iii) Find the names of the persons who do not work for Infosys.
 - iv) Find the persons whose salaries are more than that of all oracle employees.
 - v) Find the name of the companies that are located in every city where the company Infosys is located. 12
- b) Define 4NF and BCNF. Explain why 4NF is a more desirable normal form than BCNF. 8

OR

14. a) What are functional dependencies ? With a suitable example, explain the importance of functional dependencies in database design. 8
- b) What is the lossless join property of a decomposition ? Write an algorithm to test the non additive join property, and to determine whether functional dependencies are preserved in decomposition. 12

Module – III

15. Explain the techniques for allowing a hash file to expand and shrink dynamically. What are the advantages and disadvantages of each ? 20
- OR
16. Explain the ARIES recovery algorithm. 20
-



Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, May 2010
(2008 Scheme)**

Branch : Information Technology

08.403 : MICROCONTROLLER-BASED DESIGN (F)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions.

1. What are the factors that can affect time delay code size in the 8051 microcontroller ?
2. Compare and contrast interrupts and polling.
3. Explain the use of line driver in serial communication.
4. Explain why the conversion time for ADC0804 cannot be faster than 110 μ S.
5. Explain the role of EA and PSEN pins for 8051 interfacing with external memory.
6. List reasons for LCD's becoming popular over LED's.
7. How many four step sequences are required to rotate a motor 256° in clockwise direction if step angle is 2° ?
8. Write a program to find the number of zeroes in register R2.
9. Write a short note on ARM processors.
10. Explain with example DA instruction. **(10×4=40 Marks)**



PART – B

(Answer any **one** question from **each** module)**Module – I**

11. a) Explain with example how to access 8051 memory using various addressing modes. **10**
- b) Write a program to convert the following packed BCD 0111 0101 number to two binary numbers and transfer these numbers to registers R0 and R1. **10**

OR

12. a) Explain with diagram input/output programming. **10**
- b) Write a program to add all the digits of your candidate code and save result in R3. The result must be in BCD. The data is stored in on-chip ROM (in ASCII format). **10**

Module – II

13. a) Explain in detail external interrupts and serial communication interrupts in 8051. **10**
- b) A buzzer is connected to pin (P1.2). Write an 8051 C program to monitor buzzer and create the following frequencies on pin (P2.3).
buzzer = on , 250 Hz
buzzer = off, 400 Hz. Use Timer 0, mode1. **10**

OR

14. a) Explain with example serial data transmission and reception. **10**
- b) Write a program to create a square wave of $T = 160$ ms on pin (P2.2) while at the same time the 8051 is sending out 55 H and AAH to P1 continuously. **10**

Module – III

15. a) Explain with diagram DAC interfacing with 8051. **10**
- b) Explain memory address decoding. **10**

OR

16. a) Explain with diagram 8051 connection to external Data RAM. **10**
- b) Write a program to send code or data to the LCD with checking busy flag. **10**
-



Reg. No. :

Name :

**Fourth Semester B.Tech. Degree Examination, May 2010
(2008 Scheme)**

Branch : Information Technology

08.405 : DATA STRUCTURES AND ALGORITHMS (RF)

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all questions from Part A and any one question from each of the Module of Part B.

PART – A

1. What is structured programming ?
2. What important details are normally included in internal documentation ?
3. What do you mean by complexity analysis of algorithms ?
4. What are priority queues ? How will you implement it ?
5. Give an implementation of a sparse matrix.
6. Given the inorder and preorder traversals of a binary tree, draw the binary tree.

INORDER : G F H K D L A W R Q P Z

PREORDER : A D F G H K L P Q R W Z

7. Give the recursive algorithm for Depth first search of a graph.
8. Give the linked list representation of a polynomial having three variables.
9. Illustrate the boundary-tag method of storage management.
10. What is hashing ? Explain an instance where hashing technique is used.

(4×10=40 Marks)

P.T.O.



PART – B

Module – I

11. a) Define the data structure queue and give the details of its implementation using array. 8
- b) Show how to implement a queue using an array $Q[100]$, where $Q[0]$ is used to indicate the Front and $Q[1]$ is used to indicate Rear and $Q[2]$ through $Q[99]$ are used to contain the queue elements. Show how to initialize such an array to represent empty queue and write routines Remove, Insert which work on this queue. 12
12. a) Define Stack and illustrate its implementation using linked list. 8
- b) Write routines to implement two stacks using only one array. Your stack routines should not declare an overflow unless every slot in the array is used. 12

Module – II

13. a) Give the Linked List representation of a Binary Search Tree. What are the operations performed on a Binary Tree? 8
- b) It is required to build a binary search tree with a set of data. Write a function for inserting an item into a binary search tree. Use this function to build a tree from a given set of data as input. 12
14. a) Illustrate the two methods of representing a graph with suitable example. 8
- b) Give Dijkstra's algorithm for finding the shortest path. 12

Module – III

15. a) Define stability of Sorting. Give two sorting methods which are not stable. 4
- b) Give the algorithm for Quicksort and derive its best case time complexity. 12
- c) Show that quicksort takes $O(N^2)$ time when the input list is already in sorted order. 4
16. a) Compare the time complexities of linear search, binary search and searching from hash tables. 8
- b) Let N be the number of data under sort which is residing in a magnetic tape. The whole data is divided into n blocks of equal size which is decided by the capacity of the internal memory. Illustrate, how balanced two-way merge sort is used for sorting this data? 12