



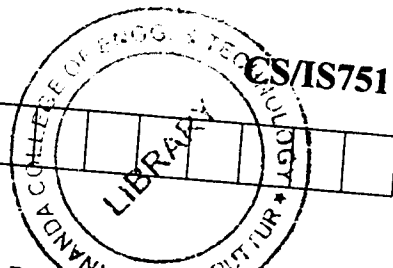
- c. Discuss how time is represented in temporal databases and compare the different time dimensions. (05 Marks)
- d. How do spatial databases differ from regular databases? (05 Marks)
- 6 a. What are the main reasons for and potential advantages of distributed databases? (10 Marks)
- b. Discuss the factors that do not appear in centralized systems that affect concurrency control and recovery in distributed systems. (10 Marks)
- 7 a. What are goals or tasks that data mining attempts to facilitate? (05 Marks)
- b. What are five types of knowledge produced from data mining? (05 Marks)
- c. Describe the characteristics of a data warehouse. Divide them into functionality of a warehouse and advantages users derive from it. (10 Marks)
- 8 Write notes on:
  - a. Mobile databases
  - b. GIS
  - c. Multimedia databases
  - d. Genome data management.(20 Marks)

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**NEW SCHEME**

**Seventh Semester B.E. Degree Examination, May / June 2006**  
**CS / IS**

**Advanced DBMS**

Time: 3 hrs.]

[Max. Marks:100

**Note: 1. Answer any FIVE full questions.**

- 1 a. Discuss the advantages and disadvantages of using
  - i. an unordered file
  - ii. an ordered file
  - iii. a static hash file with buckets and chaining.

(10 Marks)
- b. A PARTS file with Part# as hash key includes records with the following Part# values: 2369, 3760, 4692, 4871, 5659, 1821, 1074, 7115, 1620, 2428, 3943, 4750, 6975, 4981, and 9028. The file uses eight buckets, numbered 0 to 7. Each bucket is one disk block and holds two records. Load these records into the file in the given order, using the hash function  $h(k) = k \bmod 8$ . Calculate the average number of block accesses for a random retrieval on Part#.  

(10 Marks)
- 2 a. How does multilevel indexing improve the efficiency of searching an index file?  

(05 Marks)
- b. How does a B-tree differ from a B<sup>+</sup>-tree? Why is a B<sup>+</sup>-tree usually preferred as an access structure to a data file?  

(05 Marks)
- c. A PARTS file with Part# as key field includes records with following Part# values: 23, 65, 37, 60, 46, 92, 48, 71, 56, 59, 18, 21, 10, 74, 78, 15, 16, 20, 24, 28, 39, 43, 47, 50, 69, 75, 8, 49, 33, 38. Suppose that the search field values are inserted in the given order in a B<sup>+</sup>-tree of order  $p = 4$  and  $p_{leaf} = 3$ ; show how the tree will expand and what the final tree will look like.  

(10 Marks)
- 3 a. What is meant by the term heuristic optimization? Discuss the main heuristics that are applied during query optimization.  

(10 Marks)
- b. What is the difference between pipelining and materialization?  

(05 Marks)
- c. What is meant by semantic query optimization? How does it differ from other query optimization techniques?  

(05 Marks)
- 4 a. What are the origins of the object-oriented approach?  

(05 Marks)
- b. What are the differences and similarities between objects and literals in the ODMG object model?  

(10 Marks)
- c. What are main differences between designing a relational database and an object database?  

(05 Marks)
- a. What are the differences between row-level and statement-level rules?  

(05 Marks)
- b. Discuss some applications of active databases.  

(05 Marks)

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3. (a) What is a query execution plan?  
 (b) What is meant by cost-based query optimization?  
 (c) Given a query on an EMPLOYEE database to find the last names of employee born before 1957, who work on the project name 'Aquarius'; write the Initial query tree. Write the following steps to convert the given query from Initial query tree using heuristic-optimization.

- i) Moving SELECT operation down the tree.
- ii) Applying more restrictive SELECT operation.
- iii) Replacing Cartesian product and SELECT with join operation.
- iv) Moving project operation down the query tree.

```
SELECT  LNAME
FROM    EMPLOYEE, WORKS-ON, PROJECT
WHERE   PNAME='Aquarius' AND
        PNUMBER =PNO AND
        ESSN=SSN AND
        BDATE= '1957-12-31';
```

(10 Marks)

4. (a) What are the differences and similarities between objects and literals in the ODMG object model?  
 (b) Describe the steps of the algorithm for object database design by EER to OO mapping.  
 (c) How would a view integration tool work?

(6 Marks)

(10 Marks)

(4 Marks)

5. (a) What are the differences among immediate, deferred and detached consideration of active rule conditions?  
 (b) Consider the relational schema shown in fig.5(b), write active rules for keeping the SUM\_COMMISSIONS attribute of SALESPERSON equal to the sum of the COMMISSION attribute in SALES for each person.

(8 Marks)

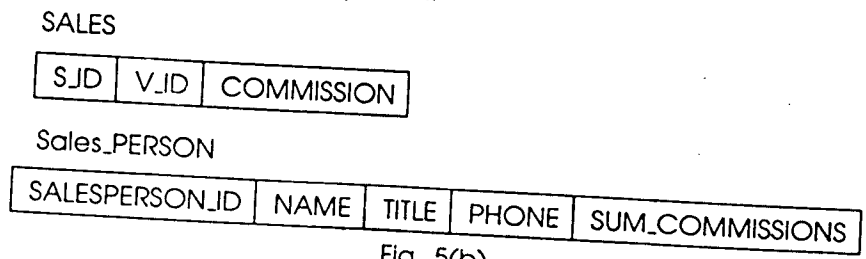


Fig. 5(b)

Your rules should also check if the SUM\_COMMISSIONS exceeds 100000; if it does, call a procedure NOTIFY\_MANAGER(S\_ID). Write both statement\_level rules in STARBVRST notation and ROW\_LEVEL rules in Oracle.

(12 Marks)

6. (a) What is a fragment of a relation? What are the main types of fragments? Why is fragmentation a useful concept in distributed database design?  
 (b) Compare the two tier and three-tier client server architectures.  
 (c) Discuss the naming problem in distributed database.

(10 Marks)

(5 Marks)

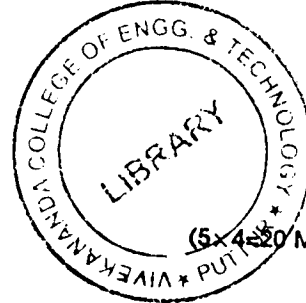
(5 Marks)

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- 7. (a) What types of indexes are built for a warehouse? Illustrate the uses for each with an example. (8 Marks)
- (b) What are the five types of knowledge produced from data mining? (5 Marks)
- (c) Describe the steps of building a warehouse. (7 Marks)

8. Write short notes on :

- (a) Association rules in data mining
- (b) Multimedia database application
- (c) Mobile database management issues
- (d) Distributed databases



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