

BENGAL ENGINEERING AND SCIENCE UNIVERSITY, SHTBPUR
B.E.(CST) 6th SEMESTER FINAL EXAMINATION. 2010
Database Management Systems (CS 601)

Answer a>-- 7 tions

F.M. 70

Time: 3 Ins

1. a) Discuss the main characteristics of database systems and how it differs from traditional file systems.

b) What is the difference between a database schema and a database state? [7 + 3]

2. a) Construct an E-R diagram for a hospital with a set of patients and set of doctors. Associate with each patient a log of the various tests and examinations conducted.

b) What is the difference between a specialization and generalization? Define derived attribute. [6 + 4]

3. a) Discuss the characteristics of relations that make them different from ordinary tables and files.

b) Define foreign key and candidate key.

c) Why are tuples in a relation not ordered? [5 + 3 + 2]

4. a) Why can we have at most one primary or clustering index on a file, but several secondary indexes?

b) Consider a disk with block size 13×512 bytes. A block pointer is $1 \times (J \text{ bytes long})$ and record pointer is $P_j = 7$ bytes long. A file has $r = 30001$ Employee records of fixed length of 125 bytes long. Suppose that the file is ordered by the key field ENO and we want to construct a primary index on ENO. Calculate (i) the index blocking factor; (ii) the number of levels needed if we make it into a multilevel index (iii) the number of block accesses needed to search for and retrieve a record from the file - given its ENO value - using the primary index.

[2 + 8]

5.a) A University placement centre maintains a relational database of companies that, interview students on campus and makes job offer to those successful in the interview. The database is given below:

COMPANY (cname, duration)

STUDENT (rollno, sname, sdegree)

INTERVIEW (cname, rollno, idate)

OFFER (cname, rollno, osalary)

(i) Write relational algebra expression for the following query:

List the roll number and name of those students who appeared at least one interview but did not receive any job offer.

(ii) Write an SQL query to list, for each degree program in which more than five students were offered jobs, then name of the degree and average offered salary of students in the degree program.

b) Define database trigger. What are different types of trigger? What are the triggering events? [5 + 5]

