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2005 JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

IV B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS

DATA BASE MANAGEMENT SYSTEM

(ELECTRICAL&ELECTRONICS ENGINEERING)

NOVEMBER 2005

TIME: 3 HOURS

MAX MARKS: 80

Answer any FIVE Questions
All Questions carry equal marks
? ? ? ? ?

1. (a) Consider the following scheme given. The primary keys are underlined. Sailors(sailor-
id, sailor-rating, sailor-age)
Boats(boat-id, boat-name, boat-color)
Reserves(sailor-id, boat-id, day)
Write the queries in Relational algebra

- i. Find the names of sailors who have reserved a red and a green boat
- ii. Find the names of sailors who have reserved at least two boats
- iii. Find the sailor-ids of sailors with age over 22 and who have not reserved a green boat.
- iv. Find the names of sailors who have reserved all boats
- v. Find the names of sailors who have reserved all boats called BlueMoon.
[2+2+2+2+2]

(b) Given two relations R1 and R2 , where R1 contains N1 tuples, R2 contains N2 tuples, and $N2 > N1 > 0$, give the minimum and maximum possible sizes (in tuples) for the result relation produced by each of the following relational algebra expressions. In each case, state any assumptions about the schemas for R1 and R2 that are needed to make the expression meaningful.

- i. $R1 \cup R2$
- ii. $R1 \setminus R2$
- iii. $R1 - R2$ [2+2+2]

2. (a) Is QBE based upon relational algebra, tuple relational calculus, or domain relational calculus ? Explain.

(b) Is QBE relationally complete ? Explain.

(c) What restrictions does QBE pose on update commands? Explain with example. [4+5+7]

3. (a) What are the differences between static and dynamic files

(b) Discuss the techniques for allocating file blocks on disk. [8+8]

4. Discuss the salient features of processing a high level query. Mention the steps and explain each step with an example. [16]

5. (a) Discuss about cost of sort-merge join.

(b) Describe conjunctive normal form and explain why it is important in the context of relational query evaluation.

6. (a) Explain the difference between weak entity and strong entity set? How to represent the strong entity and weak entity set through ER-diagrams

(b) The State Bank of India offers the five different types of accounts : loan, checking, recurring deposits, locker accounts and fixed deposit. . The Bank has a number of branches and a client of the bank can open many accounts. A account can be joint and more than one client may operate an account. Identify the entities , attributes what relationships exist among these entities and Tables. Draw the corresponding E-R diagram [8+8]

7. Explain the concept of transaction. How does the recovery manager ensure atomicity of transactions and how does it ensure durability? [16]

8. (a) What is the difference between

i. Stable storage and disk.

ii. System crash and a media failure.

iii. Check points and fuzzy dumps. [3+3+4]

(b) Give a short note on crash recovery.