

Roll No.

2113

B. E. IVth Sem. (IT)

Examination - December, 2009

DATABASE MANAGEMENT SYSTEMS

Paper : CSE-202-E

Time : Three hours]

[Maximum Marks : 100

Before answering the question, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Discuss the complete architecture of a database system.
(b) What are the duties and responsibilities of a DBA ? Discuss.
2. (a) Construct an ER-diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of various tests and examinations conducted.

- (b) Construct appropriate tables for the ER-diagram constructed in Q. 2. (a)
3. (a) What are the causes of bucket overflow in a hash file organization ? What can be done to reduce occurrence of bucket overflow ?
- (b) Differentiate between sequential and index sequential file.
4. Consider the following database scheme where the primary keys are underlined :
- Employee (name, SSN, bdate, address, salary, Dno)
- Department (Dname, Dnumber, Mgr SSN)
- Deptt-locations (Dnumber, Dlocation)
- Project (Pname, Pnumber, Plocation, Dnum)
- Works-on (ESSN, Pno, hours)
- Dependent (ESSN, dependentname, bdata, relationship)
- Express the following queries in relational algebra and tuple relational calculus :
- (a) Retrieve the name and address of all employees who work for 'Research' department.
- (b) For every project located in London, list the project number, controlling department no. and the department manager's name, birth date and address.
- (c) Retrieve the names of employees who have no dependants.

- (d) Find names of employees who work on all the projects controlled by department no.5
5. (a) Define the term functional dependency. Why are some functional dependencies called trivial ?
- (b) Give a set of FDS for the relation scheme $R(A, B, C, D)$ with primary key AB under which R is in 2NF but not in 3NF.
- (c) Consider the relation scheme $R(A, B, C)$ which has the FD $B \rightarrow C$. If A is a candidate key for R, is it possible for R to be in BCNF ? If so, under what conditions ? If not, explain why not.
6. (a) What are distributed databases ? What are their advantages and disadvantages ?
- (b) Write a detailed note on architecture of parallel databases.
7. (a) Elaborate ACID properties of a transaction.
- (b) Describe the architecture of a datawarehouse.
8. Write short notes on the following :
- (a) MVD,
- (b) SQL,
- (c) Mapping Constraints,
- (d) Integrity Constraints.
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