

Code No: I5803/R16

M. Tech. I Semester Regular Examinations, December-2016

DATABASE MANAGEMENT SYSTEMS

Computer Science & Engineering (58)

Time: 3 Hours

Max. Marks: 60

*Answer any FIVE Questions
All Questions Carry Equal Marks*

1. a i. List four significant differences between a file-processing system and a DBMS.
ii. Discuss the functionalities of a database administrator
b i. Define the concept of aggregation. Give two examples of where this concept is useful.
ii. Construct an E-R diagram for a hospital with a set of patients and a set of doctors. Associate with each patient a log of the various tests and examinations conducted.
2. a Consider the relational schema: Employee (empno,name,office,age)
Books(isbn,title,authors,publisher) , Loan(empno, isbn,date)
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.
b Given two relations R1 and R2, where R1 contains N1 tuples and R2 contains N2 tuples, and $N2 > N1 > 0$, give the maximum and minimum 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. (a) $R1 \times R2$ (b) $\sigma_{a=5}(R1)$ (c) $\pi_a(R1)$ (d) $R1/R2$
3. a Discuss the need of Normalization & 1NF, 2NF, 3NF and BCNF with suitable example.
b i. Consider the schema $R = (A, B, C, D, E)$ is given. Give a lossless-join decomposition into BCNF of schema R. $A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$, $E \rightarrow A$
ii. What is lossy and lossless decomposition?
4. a Explain Time stamp-Based Concurrency Control protocol and the modifications implemented in it.
b Discuss in detail about ACID properties.
5. a What is indexing and list and explain different kinds of indexing.
b Discuss clearly about Indexed Sequential Access Methods (ISAM)

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6. a Discuss the decomposition preservation algorithm for all FD's.
b How Transactions are possible in Distributed database? Explain briefly
7. a Compare & contrast File systems with database systems
b Define relational algebra. With suitable example
8. a Briefly discuss about B+ tree index file structure
b Explain the concepts of serializability

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