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B.Tech. V Sem.(Main/Back) Exam Dec. 2012
Computer Science
5C54 Data Base Management System
Common for CS & IT

Time : 3 Hours **Maximum Marks : 80**

Min. Passing Marks : 24

Instructions to Candidates:

*Attempt any **five question** selecting **one question from each unit** . All Questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.*

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. **Nil** 2. **Nil**

UNIT-I

Q.1 a) Define data model. Explain similarities and differences among network, hierarchical and relational data model. [10]

b) Define key. Explain the distinctions among term primary key, candidate key and super key. [6]

OR

Q.1 a) What is RDBMS? Describe integrity constraints in relational data model. [4+6=10]

b) Write short notes on (Any three) :

(i) Participation constraints.

(ii) Role in ER-data model.

(iii) Aggregation.

(iv) Identifying Relationship. [2+2+2=6]

UNIT-II

Q.2 What is view in DBMS? List two reasons why we may choose to define a view and list two major problems with processing update operations expressed in terms of views. [4+6+6=16]

OR

Q.2 .) Consider the following database schema

employee (ename, street, city)
Works (ename, company_name, salary)
Company (company_name, city)
manager (ename, mgr_name)

Give regular expression for each of the following statements:

i) Find the company with most employees.

ii) Find the company with the smallest payroll.

iii) Give all employees of ABC company a 10-percent salary raise.

iv) Delete all tuples in the works relation for employee of XYZ company.

v) Find the names and cities of residence of all employees who work for ABC company [2+2+2+2+2=10]

b) Explain any 3 set-operators and 3-Aggregate operators in SQL with the help of suitable examples. [3+3=6]

UNIT-III

Q.3 a) Define Functional Dependency. Explain Armstrong's axioms or rules, with examples. [2+6=8]

b) Compute F^+ of the following set F of Functional Dependency for relation schema R = (A, B, C, D, E). [4

$A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$, $E \rightarrow A$

c) List the candidate key for R (given in Q. 3.b.) [4

OR

[Contd...

Q.3 a) Decompose the schema R = (A, B, C, D, E) into (A, B,C) and (A, D, E) Show that this decomposition is a lossless-join decomposition if the following set F of functional dependencies holds:

$A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$, $E \rightarrow A$ [6]

b) Define transaction & transaction states. Give state diagram for transaction. [2+6+2=10]

UNIT-IV

Q.4 a) What is 'lock' in DBMS? What is difference between lock-based, time-stamp based and validation-based protocols for concurrency control. [2+6=8]

b) What is 'dead-lock' and 'live-lock' in DBMS? Give two dead lock prevention schemes. [4+4=8]

OR

Q.4 a) Explain the following two log-based recovery schemes

(i) Deferred Database modifications

(ii) Immediate Database modifications [4+4=8]

b) Make distinction between "Shadow Copy" and "Shadow-Paging" techniques. [4+4=8]

UNIT-V

Q.5 a) Explain the following three single level indexing.

(i) Primary Index

(ii) Clustering Index

(iii) Secondary Index [8]

b) Describe the similarities and differences between B - tree and B^+ - tree. [8]

OR

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Q.5 Construct a B - tree for the following set of key values

(80, 50, 10, 70, 30, 100, 90)

Assume that the tree is initially empty and the values are added in the order given. The number of pointers per node is 3 (i.e. order is 3).

Show the tree after each of the following series of operations.

(i) Insert 75

(ii) Insert 95

(iii) Delete 30

(iv) Delete 10

[16]

[13380]