

Total No. of Questions : 12]

T.E. IT Sem-I
Nov-Dec-2012, 2008 pattern

SEAT No. :

P822

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[4263] - 341

T.E. (Computer/ I.T. Engg.)

DATABASE MANAGEMENT SYSTEMS

(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 100

Instructions to the candidates :

- 1) Solve Section-I Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6.
- 2) Solve Section-II Q. 7 or Q. 8, Q. 9 or Q. 10, Q. 11 or Q. 12.
- 3) Answers to the two sections must be written in separate books.
- 4) Neat diagrams must be drawn wherever necessary.
- 5) Assume suitable data if necessary.

SECTION - I

- Q1)** a) Explain various components and database system structure with the help of neat diagram. [10]
b) Explain multi-user DBMS architecture. [4]
c) Specify the CODD's norms to be specified by RDBMS. [4]

OR

- Q2)** a) What are the various features of extended E-R diagrams [EER]. Explain in details with the help of example. [10]
b) What is a data abstraction? [4]
c) What is integrity constraint? Explain referential integrity constraints. [4]

- Q3)** a) Consider the relational database : [8]

dept (dept _ no, dname, LOC)
emp (emp _ no, ename, designation)
project (proj _ no, proj _ name, status)
empproject (emp _ no, proj _ no)
dept and emp are related as 1 to many
proj and emp are related as 1 to many

Write relational expressions for the following :

- i) List all employees of 'INVENTORY' department of 'PUNE' location.
- ii) Give the names of employees who are working on 'Blood Bank' project.
- iii) Give the name of managers from 'MARKETING' department.
- iv) Give all the employees working under status 'INCOMPLETE' projects.

P.T.O.

- b) Explain stored procedures and triggers with example. [8]

OR

- Q4) a) Explain various join operations with example. [8]
b) What is cursor? Explain various types of cursor. [8]

- Q5) a) State and prove Armstrong's axioms for functional dependencies. [8]
b) A set of FD's for the relation R (A, B, C, D, E, F) is $AB \rightarrow C$, $C \rightarrow A$, $BC \rightarrow D$, $ACD \rightarrow B$, $BE \rightarrow C$, $EC \rightarrow FA$, $CF \rightarrow BD$, $D \rightarrow E$. Find the minimum canonical cover for this set of FD's. [8]

OR

- Q6) a) What is decomposition? Suppose that we decompose the schema $R = (A, B, C, D, E)$ into (A, B, C) and (A, D, E) , show that this decomposition is a loseless decomposition if the following set F of functional dependencies holds :
 $A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$, $E \rightarrow A$. [8]
b) Define Boyce-Codd normal form. How does it differ from 3NF? Why is it considered a stronger form of 3NF? [8]

SECTION - II

- Q7) a) Construct a B⁺ tree for the following set of key values.
(2, 3, 5, 7, 11, 17, 19, 23, 29, 31)
Assume order of tree is 4. [8]
b) Explain the role of "selection" operation in query processing. [8]

OR

- Q8) a) What is ordered indices? Explain the types of ordered indices with suitable example. [8]
b) Explain equivalence rules for query optimization. [8]
Q9) a) Which are different crash recovery methods? Explain any one in detail? [8]
b) What is meant by "Transaction"? Explain obstruct transaction model with state diagram. [8]

OR

- Q10) a) Explain two-phase locking protocol. How does it ensure resializality? [8]
b) Explain shadow paging recovery and log-based recovery scheme. [8]

Q11) Write a short note on any three :

[18]

- a) Data warehouse.
- b) Association rules for data mining.
- c) Distributed database system.
- d) Persistent programming languages.

OR

Q12) a) Compare relational model Vs object-oriented model.

[6]

b) What is fragment of a relation? What are the main types of fragments?
Why is fragmentation a useful concept in distributed database design? [8]

c) Explain the need of backup and replication.

[4]

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