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10CS54

Fifth Semester B.E. Degree Examination, Dec.2013 / Jan. 2014
Database Management Systems

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART - A

1 a. What are the responsibilities of DBA and Database designers? **(04 Marks)**

b. With a diagram, explain the components modules of DBMS and their interactions. **(08 Marks)**

c. List the advantages and disadvantages of DBMS. Discuss any five advantages by comparing with file systems. **(08 Marks)**

2 a. Define the following terms : i) Recursive relationship ii) Weak entity type iii) Atomic attributes iv) Participation role. **(04 Marks)**

b. Discuss the conventions for displaying an ER schemas as an ER diagram. **(04 Marks)**

c. Draw an ER diagram for Musicians who perform for album. Assume any four entities. Indicate all key and cardinality constraints and any assumptions that are made. **(12 Marks)**

3 a. List and explain characteristics of relations. **(06 Marks)**

b. List set theory operations used in relational data model. Explain any two with example. **(06 Marks)**

c. Consider the following relations for a sailors database that keeps track of reservation of boats by sailors.
SAILORS (SID, SNAME , RATING, AGE)
BOATS (BID, BNAME ,COLOR)
RESERVES (SID, BID, DAY)
Specify the following queries in relational algebra.
i) Find the sids of sailors with age over 20 who have not reserved a 'Red' boat.
ii) Find the names of sailors who have reserved all boats.
iii) Find the names of sailors who have reserved boat 103. **(08 Marks)**

4 a. Describe the six clauses in the syntax of an SQL Retrieval Query. Show what type of constructs can be specified in each of the six clauses. Which of the six clauses are required and which are optional. **(06 Marks)**

b. Explain how the group by clause works. What is the difference between the Where and Having clause? **(04 Marks)**

c. Consider the following relations for a database.
Supplier (Sno, Sname, Status, City)
Product (Pno, Pname, Color, Weight, City)
Shipments (Sno, Pno, Qty)
Specify the following queries in SQL.
i) Retrieve names of supplier who supply part P_2.
ii) Retrieve the names of suppliers who do not supply any part supplied by S_2.
iii) Retrieve parts number for all parts supplied by more than one supplier.
iv) For each part supplied, get the part number, maximum quantity, minimum quantity supplied for that part.
v) Retrieve supplier numbers for suppliers with status less than the current maximum in the supplier table. **(10 Marks)**

PART - B

5 a. List the differences between Independent nested and co – related nested query. **(04 Marks)**

b. Discuss main approaches to database programming. What you mean by Impedance mismatch. **(08 Marks)**

c. With program segment, explain retrieving of tuples with embedded SQL. **(08 Marks)**

6 a. Discuss insertion, deletion and modification anomalies. Why are they considered bad? Illustrate with examples. **(08 Marks)**

b. What you mean by closure of attribute? Write an algorithm to find closure of attribute. **(06 Marks)**

c. Given below are two sets of FDs for a relation R(A, B, C, D, E). Are they equivalent?
i) $A \rightarrow B$, $AB \rightarrow C$, $D \rightarrow AC$, $D \rightarrow E$ ii) $A \rightarrow BC$, $D \rightarrow AE$. **(06 Marks)**

7 a. Consider the following Universal relation
$R = \{A, B, C, D, E, F, G, H, I, J\}$ and the set of function dependencies.
$F = \{ \{A, B\} \rightarrow C, A \rightarrow \{D, E\} , B \rightarrow F , F \rightarrow \{G, H\} , D \rightarrow \{I, J\} \}$. What is the key of R? Decompose R into 2NF, then 3NF relations. **(08 Marks)**

b. What is the dependency preservation property for a decomposition? Why is it important? **(06 Marks)**

c. Define fourth normal form. When is it violated? Why is it useful? **(06 Marks)**

8 a. What are the anamalies occur due to interleave execution? Explain them with example. **(08 Marks)**

b. Consider the three transactions T_1, T_2 and T_3 and schedules S_1 and S_2 given below. Determine whether each schedule is serializable or not. If a schedule is serializable. Write down the equivalent serial schedule (S). **(08 Marks)**
$T_1 : R_1(X) ; R_1(Z) ; W_1(X) ;$
$T_2 : R_2(Z) ; R_2(Y) ; W_2(Z) ; W_2(Y) ;$
$T_3 : R_3(X) ; R_3(Y) ; W_3(Y) ;$
$S_1 : R_1(X) ; R_2(Z) ; R_1(Z) ; R_3(X) ; R_3(Y) ; W_1(X) ; W_3(Y) ; R_2(Y) ; W_2(Z) ; W_2(Y) ;$
$S_2 : R_1(X) ; R_2(Z) ; R_3(X) ; R_1(Z) ; R_2(Y) ; R_3(Y) ; W_1(X) ; W_2(Z) ; W_3(Y) ; W_2(Y) ;$

c. Describe the three steps in crash Recovery in Aries. What is the goal of the each phase? **(04 Marks)**

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