(Please write your Exam Roll No.) *Exam Roll No.* ....589.....

END TERM EXAMINATION

SECOND SEMESTER [MCA] MAY-JUNE-2014

Paper Code: MCA-108 ***Subject: Database Management System (Batch 2010 Onwards)***

Time: 3 Hours ***Maximum Marks: 60***

Note: Attempt any five questions, including Q.no.1 which is compulsory.

Q1 (a) What do you mean by a data model? Explain some features of hierarchical data model.
(b) Define data abstraction. Give a three tier database architecture which supports it.
(c) What do you mean by nested queries in SQL? Give its one example.
(d) What do you mean by cursors and triggers?
(e) Define ACID properties of a transaction. **(5x4=20)**

Q2 (a) How database management system is useful over a conventional file system? **(5)**
(b) Explain the concept of generalization using suitable entity relationship diagram. **(5)**

Q3 (a) What do you mean by a foreign key? Define referential integrity constraint with suitable example. **(5)**
(b) Define PROJECT, NATURAL JOIN & DIVISION relational algebra operations. **(5)**

Q4 (a) Define a view in SQL. Show with suitable example that insertion of tuples through view may not be always possible. **(5)**
(b) Explain with suitable example the creation and modification of a relational schema in SQL. **(5)**

Q5 (a) Compute the closure of the following set F of functional dependencies for relation schema R(A, B, C, D, E) **(6)**
$A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$ and $E \rightarrow A$. List the candidate key for R.
(b) Define the concept of table space. **(4)**

Q6 (a) Define a relational schema which is in 3NF but not in BCNF. **(5)**
(b) Give a lossless join decomposition of relational schema R(A,B,C,D,E) using following set F of functional dependencies-
$A \rightarrow BC$, $CD \rightarrow E$, $B \rightarrow D$ and $E \rightarrow A$. Further, check whether your decomposition is dependency preserving or not. **(5)**

Q7 (a) Define two phase locking protocol. Define a transaction that satisfies two phase locking protocol. **(7)**
Further, explain with suitable example that this protocol has the possibility of deadlock and cascading rollbacks.
(b) Define read and write time stamp values of a transaction. **(3)**

Q8 What are the features of a distributed database system? Define various transparencies which are used in it. Further, explain vertical and horizontal fragmentation used in distributed database with suitable example. **(10)**

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