ROLL NO. _____

Code: AC61/AT61/AC112/AT112
Subject: DATABASE MANAGEMENT SYSTEMS

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours **December 2016** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 Minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Q2 TO Q7 CAN BE ATTEMPTED BY BOTH CURRENT AND NEW SCHEME STUDENTS.**
- **Q8 AND Q9 HAVE BEEN GIVEN INTERNAL OPTIONS FOR CURRENT SCHEME (CODE AC61/AT61) AND NEW SCHEME (CODE AC112/AT112) STUDENTS.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. Which operator is used to select the subset of tuples in a table?
(A) Π **(B)** σ
(C) δ **(D)** x

b. An entity that does not have a key is called.
(A) Strong **(B)** Weak
(C) Normal **(D)** Very Strong

c. Second Normal form is used to remove the
(A) Partial dependency **(B)** Functional dependency
(C) Multivalue dependency **(D)** Transitive dependency

d. Which of the following is not an example of Join Operation?
(A) Equi Join **(B)** Natural Join
(C) Outer Join **(D)** Semi Join

e. Which operator is used in SQL for Pattern matching?
(A) NULL **(B)** LIKE
(C) NOT **(D)** HAVING

f. Instead of creating a separate index for each attribute the indexes are combined in to one called _____.
(A) dense index **(B)** sparse index
(C) inverted index **(D)** secondary index

g. The methods logs the old value, each time a database element is changed.
(A) undo logging **(B)** redo logging
(C) undo/redo logging **(D)** logging

h. In which entire database is copied.
(A) full dump **(B)** incremental dump
(C) archive **(D)** Mirrored

i. A transaction is said to be complete when it has successfully done.
(A) Commit **(B)** Redo
(C) Undo **(D)** Redo/Undo

j. Way to avoid deadlock problems by using a third lock mode called _____.
(A) record lock **(B)** update lock
(C) release lock **(D)** getting lock

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. With a neat sketch, explain the three schema architecture of DBMS. **(6)**

b. What is an ER Diagram? What are its benefits? With a neat sketch draw the ER diagram for company schema with all the constraints. **(10)**

Q.3 a. Define the Entity Integrity and Foreign Key Constraint. **(4)**

b. Exlpain the SELECT AND PROJECT Operations with suitable examples. **(4)**

c. Explain the Division and Aggregation operations in Relational Algebra with example. **(8)**

Q.4 a. Explain DDL and DML commands used in SQL with suitable examples. **(6)**

b. Write an SQL Query to add an attribute in a table. **(4)**

c. Write short note on Views in SQL. **(6)**

Q.5 a. Explain 1NF, 2NF, 3NF, BCNF with suitable examples. **(10)**

b. What do you mean by Join Dependencies? Explain the Fifth Normal Form. **(6)**

Q.6 a. Define ACID Properties of Transactions. **(4)**

b. Differentiate Shared Locks with Exclusive Locks. **(2)**

c. Explain the Thomas's Write Rule in detail. **(6)**

d. Discuss on multiversion Technique based on Time stamp Ordering. **(4)**

Q.7 a. What is the difference between the UNDO/REDO and UNDO/NO-REDO algorithms for recovery with immediate update? Discuss in detail. **(10)**

b. Describe the Shadow paging recovery technique. **(6)**

Q.8 (For Current Scheme student i.e. AC61/AT61)

a. Differentiate between Hashing and Indexing. Explain Internal hashing with its advantages and disadvantages. **(10)**

b. Write short note on B+ trees. **(6)**

Q.8 (For New Scheme student i.e. AC112/AT112)

a. Explain Specialization and Generalization with suitable example. **(8)**

b. What are distributed databases? Explain the 3-tier Client-Server architecture of Distributed Databases. **(8)**

Q.9 (For Current Scheme student i.e. AC61/AT61)

a. Describe all types of Joins in Relational Algebra with suitable example. **(6)**

b. Explain the heuristic query optimization technique. **(10)**

Q.9 (For New Scheme student i.e. AC112/AT112)

a. Explain how Granting and revoking Privileges to database users is done by database administrator. **(8)**

b. What is database security? Why is it needed? Illustrate the challenges of Database Security? **(8)**