ROLL NO. _____

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

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours **JUNE 2017** **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. The DBMS acts as an interface between what two components of an enterprise-class database system?

(A) Database application and the database
(B) Data and the database
(C) The user and the database application
(D) Database application and SQL

b. The following are components of a database except _____

(A) user data **(B)** metadata
(C) reports **(D)** indexes

c. _____ is a combination of two or more attributes used as a primary key

(A) Composite Key **(B)** Alternate Key
(C) Candidate Key **(D)** Foreign Key

d _____ allows individual row operation to be performed on a given result set or on the generated statement.

(A) Procedure **(B)** Trigger
(C) Cursor **(D)** None of these

e. You have run an SQL statement that asked the DBMS to display data in a table named USER_TABLES. The results include columns of data labeled "TableName," "NumberOfColumns" and "PrimaryKey." You are looking at _____ .
(A) user data **(B)** Meta data
(C) A report **(D)** indexes

f. The default date format in SQL is
(A) DD-MON-YY **(B)** DD-MM-YY
(C) DD/MON/YY **(D)** DD/MM/YY

g. The method in which records are physically stored in a specified order according to a key field in each record is
(A) Hash **(B)** Direct
(C) Sequential **(D)** All of these

h. E-R model uses the following symbol to represent weak entity set.
(A) Diamond **(B)** Dotted diamond
(C) Rectangle **(D)** Dotted rectangle

i. Key to represent relationship between tables is called
(A) Primary key **(B)** Secondary key
(C) Foreign key **(D)** None of these

j. Which of the following is an advantage of view?
(A) Data security **(B)** Derived columns
(C) Hiding complex queries **(D)** All of these

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

Q.2 a. With an E-R diagram Illustrate employee database. Include all types of attributes and entities. **(10)**

b. Compare centralized and client/ server architecture of DBMS **(6)**

Q.3 a. Explain the various constraints of relational model in detail **(10)**

b. Explain SELECT AND PROJECT Operations with Example **(6)**

Q.4 a. With necessary example illustrate the steps E-R to Relational model mapping Algorithm **(12)**

b. Retrieve all employees in department 5 whose salary is between $30,000 and $40,000 from Employee table. **(2)**

c. List the aggregate functions in SQL **(2)**

Q.5 a. Define normalisation **(4)**

b. Write notes on 1st, 2nd, 3rd and BCNF normal forms with necessary examples **(12)**

Q.6 a. List the desirable properties of a transaction **(4)**

b. Explain the concept of serializability in transaction processing. Define types of schedules of transaction. **(2+10)**

Q.7 a. Define the concept of Lock in Concurrency Control. Differentiate Shared Locks with Exclusive Locks. **(4)**

b. Discuss on Thomas's Write Rule **(6)**

c. Discuss the multiversion Technique based on Time stamp Ordering **(6)**

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

a. Discuss the various types of file operations **(6)**

b. Explain briefly about hashing techniques **(10)**

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

a. What is distributed database? Explain the 3- tier client/server architecture of distributed database. **(3+5)**

b. Why is data replication useful in DBMS? What typical units of data are replicated? **(4+4)**

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

a. With a neat diagram explain the steps of processing a high level query. **(8)**

b. Discuss the various methods for implementing Join operation. **(8)**

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

a. Write notes on mandatory access control and role based access control for multilevel security. **(10)**

b. Illustrate the challenges of Database Security **(6)**