

Roll No.

BCA-501(N)

B. C. A. (Fifth Semester) EXAMINATION, Dec., 2017

(New Course)

Paper First

INTRODUCTION TO DBMS

Time : Three Hours]

[Maximum Marks : 75

Note : Attempt questions from all Sections as directed.

Inst. : The candidates are required to answer only in serial order. If there are many parts of a question, answer them in continuation.

Section—A

(Short Answer Type Questions)

Note : All questions are compulsory. Each question carries 3 marks.

1. (A) Discuss the mechanism used to read data from or write data to the disk.
- (B) Discuss the techniques for record deletion.
- (C) What is the two-phase locking protocol ?

- (D) What is meant by the concurrent execution of database transaction in a multiuser system ?
- (E) List the types of privileges available in SQL.
- (F) What is meant by revoking a privilege ?
- (G) What is a functional dependency ? Why can we not infer a FD automatically from a particular relation state ?
- (H) List the data types that are allowed for SQL attributes.
- (I) Discuss the entity integrity and referential integrity constraints. Why is each considered important ?

Section—B

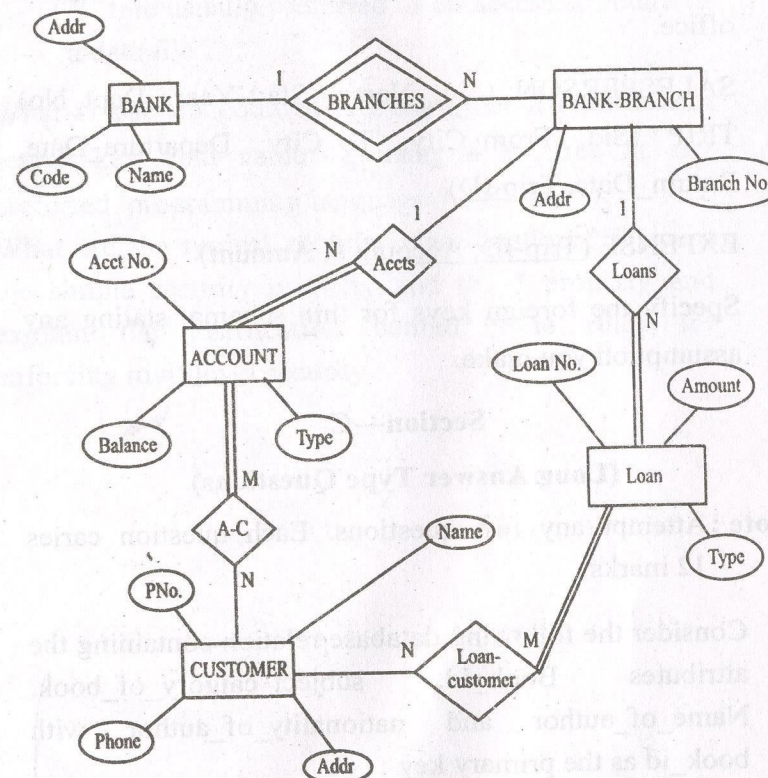
(Long Answer Type Questions)

Note : Attempt any *two* questions. Each question carries 12 marks.

2. Consider the ER diagram shown in figure for part of a bank database. Each bank can have multiple branches and each branch can have multiple accounts and loans.

- List the (non weak) entity types in the ER diagram.
- Is there a weak entity type ? If so, give its name, partial key and identifying relationship.
- List concisely the user requirements that led to this ER schema design.

- (d) List the names of all relationship types :



- Describe the three-schema architecture. Why do we need mapping between schema levels ? How do different schema definition language support thin architecture ?
- Discuss the capabilities that should be provided by a DBMS. What are the responsibilities of the DBA and the database designers ?

5. Consider the following relations for a database that keep track of business trips of salespersons in a sales office.

SALESPERSON (Sid, Name, Start-Year, Dept_No)

TRIP (Sid, From_City, To_City, Departure_Date, Return_Date, Trip-ID)

EXPENSE (Trip-ID, Account #, Amount)

Specify the foreign keys for this schema, stating any assumption you make.

Section—C

(Long Answer Type Questions)

Note : Attempt any two questions. Each question carries 12 marks.

6. Consider the following database relation containing the attributes Book_Id, subject_catgory_of_book, Name_of_author and nationality_of_author with book_id as the primary key :

- (a) What is the highest normal form satisfied by this relation ?
 - (b) Suppose the attributes books_title and author-address are added to the relation, and the primary Key is changed to {name-of-author, Book-title}. What will be the highest normal form satisfied by relation ?
7. (a) What is the difference between static and dynamic files ?

- (b) How does B-tree differ from a B^+ tree ? Why is a B^+ tree usually preferred as an access structure to a data file ?
8. What is pseudo code of searching for a record with search key field value K, using a B^+ tree in any preferred programming language ?
9. What are the typical security classification ? Discuss the simple security property and the * property and explain the justification behind these rules for enforcing multilevel security.