

MCA (SEM-III)
Data Base Management Systems
(OCT-16)

QP CODE : 511202

(3 Hours)

Total Marks: 100

N.B.

1. Question No. 1 is compulsory.
2. Attempt any **four** from the remaining **six**.
3. All questions carry **equal** marks.

Q1 A college library holds books for its members to borrow. Each book may written by more than one author. Any one author may written many books. If no copies of a wanted book are currently in stock, a member may make a reservation for the title until it is available. If books are not returned on time a fine is imposed and if fine is not paid the member is barred from loaning any other book until the fine is paid. (20)

- a) Construct an ER diagram for above library system. Document all assumptions that you make for designing.
- b) Write schema definition and normalize all tables to 3NF for the above ER Diagram.

Q2 a) Consider the following relational schema:

Book(bookid, title, publisher_name)

Book_author (bookid, author_name)

Book_copies (bookid, branchid, No_of_copies)

Write the following queries in SQL.

- 1) Retrieve the author name of book having title 'Operating System'.
- 2) Retrieve the total number of titles of each publisher.
- 3) Retrieve the total number of titles.
- 4) Retrieve title, publishername & authorname of the bookid 'B101'.
- 5) Retrieve the number of copies with bookid='B101' and branchid='BR001'.

(10)

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- b) Differentiate any two:
- 1) Strong and Weak Entity
 - 2) Specialization and Generalization
 - 3) Physical and Logical data independence (10)
- Q3 a) Explain the limitations of file processing system. (10)
- b) What is deadlock? Describe deadlock prevention and detection techniques. (10)
- Q4 a) Discuss the various steps of processing a high level query. (10)
- b) What is data model? Explain hierarchical model with its advantages and disadvantages. (10)
- Q5 a) Explain the desirable properties of decomposition. (10)
- b) Write the roles and responsibilities of DBA. (10)
- Q6 a) What is an index on a file? What is a search key for an index? Why do we need indexes? (10)
- b) What is Bell La Pedula model? Explain. (10)
- Q7 Write short note on the following (any four): (20)
- a) 2PL
 - b) Closure of set of FD
 - c) Triggers
 - d) Shadow Paging
 - e) Super and Candidate Keys
