

# CBCS Scheme

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16/17MCA23

## Second Semester MCA Degree Examination, June/July 2018 Database Management System

Time: 3 hrs.

Max. Marks: 80

Note: Answer FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Define DBMS. Discuss the characteristics of Database approach. (06 Marks)  
b. Describe three – schema architecture, with a neat diagram. (04 Marks)  
c. Discuss in detail about the advantages of DBMS over traditional file system. (06 Marks)

OR

- 2 a. Illustrate component modules of a DBMS and their interactions, with a neat diagram. (06 Marks)  
b. Briefly explain any 2 types of attributes in E – R model. (03 Marks)  
c. Define the following terms, with an example for each :  
i) Entity set ii) Cardinality ratio iii) Participation iv) Weak entity. (07 Marks)

### Module-2

- 3 a. Summarize join operations in relational algebra. (08 Marks)  
b. Consider the following relational schema and answer the following queries using relational algebra.

EMPLOYEE (Name, SSn, Bdate, Address, Sex, Salary, Super SSn, Dno)

DEPARTMENT (Dname, Dnumber, Mgr SSn, Mgr Date)

PROJECT (Pname, Pnumber, Plocation, Dnum)

WORKS\_ON (ESSn, Pno, Hours)

DEPENDENT (ESSn, Dep\_Name, Sex, Bdate, Relationship)

- i) Retrieve the name and address of all employees who work for research department.  
ii) Find the names of employees who work on all the projects controlled by Dnumber 5.  
iii) For every project located in 'Stafford' list the project no, controlling Department number, department managers, name, birth date.  
iv) Retrieve the names of employees who have no departments. (08 Marks)

OR

- 4 a. Demonstrate ER – to – Relational mapping algorithm, with an example. (08 Marks)  
b. Illustrate unary relational operations, with appropriate syntax and example. (08 Marks)

### Module-3

- 5 a. Bring out the different clauses of SELECT – FROM – WHERE – GROUP – HAVING with an example for each. (08 Marks)  
b. Explain set membership and set comparison operations for nested sub queries. (08 Marks)

OR

- 6 a. Write a short note on granting and revoking of privileges, in SQL. (05 Marks)  
b. Consider the following schema and solve the following queries in SQL. (06 Marks)  
BRANCH (Branchid , Branchname , HOD)  
STUDENT (USN, Name, Address , Branchid, Sem)  
BOOK (Bookid, Bookname , Authorid, Publisher, Branchid)  
AUTHOR(Authorid, Authurname, Country, Age)  
BORROW (USN, Bookid, Borrowed, Date)  
i) List the student details who are all studying in 2<sup>nd</sup> sem MCA.  
ii) Display the student details who borrowed more than 2 books.  
iii) Display the student details who borrowed books of more than one author.  
iv) Display the USN, Student name, Branch name , Book name of 2<sup>nd</sup> Sem MCA students.  
c. Give a brief explanation on embedded SQL. (05 Marks)

**Module-4**

- 7 a. Demonstrate the informal design guidelines for the relation schema. (08 Marks)  
b. Define Functional Dependency. List out the six inference rules of functional dependency. (04 Marks)  
c. Define Triggers. Brief about Triggers with syntax and example. (04 Marks)

**OR**

- 8 a. What is Normalization? Explain the 1NF, 2NF and 3NF with example. (10 Marks)  
b. Explain BCNF, with the help of an example. (06 Marks)

**Module-5**

- 9 a. With the help of state transition diagram, explain the states of transaction execution. (08 Marks)  
b. Define Transaction. Explain ACID properties of transaction. (08 Marks)

**OR**

- 10 a. Explain how to deal with deadlock in concurrent control mechanism. (08 Marks)  
b. What is a dock? Explain the 2PL. (08 Marks)

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