

CBCS SCHEME

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18MCA31

Third Semester MCA Degree Examination, Aug./Sept.2020 Database Management Systems

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- Explain Three – Schema architecture. What is data independence and explain different types of data independence. (10 Marks)
 - What is DBMS? Explain the advantages of using DBMS approach. (10 Marks)

OR

- Explain the characteristics of Database approach. (07 Marks)
 - Explain weak entity type with example. (03 Marks)
 - Design an ER – diagram for the following scenario. There are many movies. Each movie is identified based on movieid , having a name and language. There are many directors , each of them are uniquely identified using Directorid , having a name , address (involves Door no, Area , City , State and Pincode) and multiple phonenos. A movie is directed by only one director and a director directs many movies. Every movie having a director. There are many actors uniquely identified using Actorid , having a name , multiple phonenos, gender. A movie contains many actors and an actor can act in many movies under some role. (10 Marks)

Module-2

- Illustrate ER – to – Relational mapping algorithm, with an example. (10 Marks)
 - Explain the use of σ (select) and π (project) in Relational algebra with an example. (04 Marks)
 - Consider the following schema and answer the following queries in Relational Algebra.

DOCTOR

Did	Dname	Address	Age	Speciality
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PATIENT

Pid	Pname	Age
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TREAT

Did	Pid	Treated_date
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- List the doctor details who are having the specialty as Cardiology and with more than 50 years age.
- List the patient details, who are treated by the doctor Dr. Abhishek.
- Count the number of patients treated by each doctor. (06 Marks)

OR

- Consider the following schema and answer the queries using Relational Algebra.

STUDENT

USN	Name	Address	Age	Branchid	Sem
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BRANCH

Branchid	Bname	HOD
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BOOK

Bookid	Bookname	Authorid	Publisher
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AUTHOR

Authorid	Aname	Country
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BORROW

USN	Bookid	Borrowdate
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- i) List the details of 2nd sem, MCA students.
 - ii) List the details of Author who has written the Book named "Introduction to DBMS".
 - iii) List the Author details who had written more than two books.
 - iv) List the students who have not borrowed any books. (12 Marks)
- b. Explain the use of following operators in Relation Algebra with example. (08 Marks)
- i) DIVISION (\div)
 - ii) MINUS (-).

Module-3

- 5 a. Explain the use of following command in SQL with example : (10 Marks)
- i) UPDATE
 - ii) DELETE
 - iii) ALTER
 - iv) DROP.
- b. Consider the following schema and answer the following queries in SQL.

TOURIST

Tid	Tname	Country
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TOURIST_PLACE

Tplaceid	Tpname	State	Country
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VISITS

Tid	Tplaceid	Visited_date
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- i) List the tourist details who visited the tourist place "Mysore".
- ii) Display the details of tourist who visited atleast two tourist places.
- iii) Count the number of tourist places present in each country.
- iv) List the tourist place which is not visited by any of the tourist. (10 Marks)

OR

- 6 a. What are VIEWS in SQL? With an example, explain how to create a view and when views can't be updatable. (12 Marks)
- b. Consider the following schema and answer the queries in SQL.

EMPLOYEE

Empid	Ename	Address	Dno
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DEPARTMENT

Dno	Dname	MgrEmpid
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PROJECT

Pno	Pname	Plocation	Dno
-----	-------	-----------	-----

WORKS_ON

Empid	Pno	No_of_hours
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DEPENDENT

Dependentname	Gender	Age	Empid
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- i) Display the details of employees who are working in the Department "PRODUCTION".
- ii) List the employees who are all working on atleast two projects.
- iii) Display the employee details who have not having any dependents.
- iv) Display the employee details who works on both the projects Pno = 6 and Pno = 7.

(08 Marks)

Module-4

- 7 a. What is Functional Dependency? Write the six inference rules for FD's. (08 Marks)
- b. What is Normalization? Explain 1NF, 2NF and 3NF, with suitable example. (12 Marks)

OR

- 8 a. Explain the use of Database stored procedures with example. (08 Marks)
- b. Explain the informal guidelines for relation schema design and illustrate how violation of these guidelines may be harmful. (12 Marks)

Module-5

- 9 a. Define Transaction. Explain ACID properties with respect to transaction management. (10 Marks)
- b. With the help of state transition diagram, explain the states of transaction execution. (10 Marks)

OR

- 10 a. Explain briefly about locks and also explain the Two – phase locking protocol in handling concurrent access to a data item. (10 Marks)
- b. Explain briefly the concept of Deadlock handling during transaction processing. (10 Marks)
