

**BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT**

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

USN 

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Course Code 

2	3	M	C	A	2	1
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**Second Semester MCA Degree Examinations, November 2024**  
**DATABASE MANAGEMENT SYSTEM**

Duration: 3 hrs

Max. Marks: 100

*Note:* 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. Missing data, if any, may be suitably assumed

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PI)</u>
<b><u>MODULE – 1</u></b>			
1.	a. Explain the characteristics of database approach with its advantages and disadvantages of DBMS.	10	(2:1:1.2.1)
	b. Explain with a neat diagram three – schema architecture with its data independence.	10	(2:1:2.2.1)
<b>(OR)</b>			
2.	a. Write a note on database languages and interfaces.	10	(2:1:1.2.1)
	b. Explain the role of different actors on the scene and behind the scene.	10	(2:1:2.2.1)
<b><u>MODULE – 2</u></b>			
3.	a. What are keys? Explain different types of keys with an example.	10	(2:2:2.2.1)
	b. Explain high – level conceptual data model for database design with a neat diagram.	10	(2:2:3.2.1)
<b>(OR)</b>			
4.	a. Define the various symbols used and draw an ER diagram for the company database.	10	(2:2:2.2.1)
	b. Explain different types of relational operations with an example.	10	(2:2:3.2.1)
<b><u>MODULE – 3</u></b>			
5.	a. Explain with syntax and example of six clauses of select statement.	10	(2:2:2.2.1)
	b. Briefly explain different types of datatypes and aggregate functions in SQL with examples.	10	(2:2:3.2.1)
<b>(OR)</b>			
6.	a. Explain the following SQL commands with an example: (i) Create      (ii) insert      (iii) update      (iv) delete	10	(2:3:2.2.1)
	b. Create the following tables with properly specifying primary keys, foreign keys and solve the following queries. BRANCH (Branchid, Branchname, HOD) STUDENT (USN, Name, Address, Branchid, sem) BOOK (Bookid, Bookname, Authorid, Publisher, Branchid) AUTHOR (Authorid, Authername, Country, age) BORROW (USN, Bookid, Borrowed_Date)	10	(2:3:2.2.1)

Execute the following Queries:

- (i) List the details of Students who are all studying in 2nd sem MCA.
- (ii) List the students who are not borrowed any books.
- (iii) Display the USN, Student name, Branch\_name, Book\_name, Author\_name, Books\_Borrowed\_Date of 2nd sem MCA Students who borrowed books.
- (iv) Display the number of books written by each Author.
- (v) Display the student details who borrowed more than two books.

**MODULE – 4**

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|-----------|--|-----------|-------------|
| <b>7.</b> | <b>a.</b> Define normalization. Explain the features of database normalization and the informal design guidelines for the relational schema. | <b>10</b> | (2:4:2.1.2) |
|           | <b>b.</b> Explain 2NF and 3NF with an example.   | <b>10</b> | (2:4:2.2.1) |

**(OR)**

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|-----------|---|-----------|-------------|
| <b>8.</b> | <b>a.</b> Define functional dependency. Explain different types of functional dependency with an example. | <b>10</b> | (2:4:2.2.1) |
|           | <b>b.</b> Explain 4NF and 5NF in detail with an example.  | <b>10</b> | (2:4:2.2.1) |

**MODULE – 5**

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|-----------|---|-----------|-------------|
| <b>9.</b> | <b>a.</b> Explain transaction states and operations in detail.                  | <b>10</b> | (2:5:2.2.1) |
|           | <b>b.</b> Explain multi – version and validation concurrency control technique. | <b>10</b> | (2:5:2.2.1) |

**(OR)**

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|------------|---|-----------|-------------|
| <b>10.</b> | <b>a.</b> What is transaction processing? Explain different types of failures and the desirable properties of transactions. | <b>10</b> | (2:5:2.2.1) |
|            | <b>b.</b> Explain two – phase locking technique for concurrency control.  | <b>10</b> | (2:5:2.2.1) |

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