

BALLARI INSTITUTE OF TECHNOLOGY & MANAGEMENT

(Autonomous Institute under Visvesvaraya Technological University, Belagavi)

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Course Code

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Third Semester MBA Degree Examinations, May/June 2023

DATABASE MANAGEMENT SYSTEM

Duration: 3 hrs

Max. Marks: 100

*Note: 1. Answer any FOUR full questions from Question No. 1 to 7.**2. Question No. 8 is compulsory**3. Missing data, if any, may be suitably assumed*

<u>Q. No</u>	<u>Question</u>	<u>Marks</u>	<u>(RBTL:CO:PO)</u>
1.	a. Write a note on actors on the scene.	03	(1 :1: 1)
	b. Discuss the main characteristics of database approach and how it differs from traditional file system.	07	(2 :1: 1)
	c. Explain typical software component modules of DBMS And their interaction with Block Diagram	10	(2 :1: 1)
2.	a. Differentiate between logical data independence and physical data independence, which is easier to accomplish and why?	03	(1 :2: 2)
	b. Outline the steps to convert the basic ER model to relational database schema with example.	07	(2 :2: 2)
	c. Draw an ER diagram for COMPANY database. Assume your own entities (Minimum of 4 Entities), attributes and relationship	10	(4 :2: 2)
3.	a. Why are duplicate tuples not allowed in a Relation.	03	(2 :3: 2)
	b. Explain with example the four types of constraints which are violated during the Insert operation	07	(2 :3: 2)
	c. Write the default syntax of the stored procedures and stored functions? Give one example of each.	10	(2 :3: 2)
4.	a. Explain how a new constraint can be added using suitable examples.	03	(2 :3: 3)
	b. Write syntax of Views and Specify whether Views are updatable? Create a view which will display the department name, number of employees working and total salary for each department.	07	(2 :3: 3)
	c. Consider following schema for a Sailors database Sailors (Sname, Sid, Rating, Age) Reserves (Sid, Bid, day) Boats (Bid, Bname, Colour) Write the queries in SQL to Find the sids of all sailors who have reserved red boats but not the green boats. Find the age of the youngest sailor who is eligible to vote for each rating level with at least two such sailors. Find the name of sailors whose rating is better than some sailor called 'xyz'.	10	(3 :3: 3)
5.	a. List the inference rules for functional dependencies	03	(1 :4: 2)
	b. Explain informal quality measures employed for a relational scheme design	07	(2 :4: 2)
	c. Define 1NF, 2NF and 3NF with suitable example for each.	10	(2 :4: 3)

Note: (RBTL - Revised Bloom's Taxonomy Level: CO - Course Outcome: PO – Programme Outcome)

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| 6. | a. | Write the algorithm to determine the closure of X under F | 03 | (1 :4: 2) |
| | b. | What are the different techniques to make relation schema satisfy with 1NF. Illustrate with Example | 07 | (2 :4: 3) |
| | c. | Draw the state transition diagram the typical states that transaction goes through during execution | 10 | (2 :5: 1) |
| 7. | a. | List the properties of Transaction. | 03 | (2 :5: 1) |
| | b. | Explain the three phases of the ARIES recovery model. | 07 | (2 :5: 2) |
| | c. | Consider the three transactions T1, T2 & T3 and the schedules S1, S2 given below. Draw the serializability (precedence) graphs S1 & S2 and state whether each schedule is serializable or not. If a schedule is serializable, write down the equivalent serial schedules.
S1: R2(Z); R2(Y); W2(Y); R3(Y); R3(Z); R1(X); W1(X); R3(Y); R3(Z); R2(X); R1(Y); W1(Y); W2(X);
S2: R3(Y); R3(Z); R1(X); W1(X); W3(Y); W3(Z); R2(Z); R1(Y); W1(Y); R2(Y); W2(Y); R2(X); W2(X); | 10 | (3 :5: 3) |

8. **Case study**

Notown Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database.

- Each musician that records at Notown has an SSN, a name, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone.
 - Each instrument used in songs recorded at Notown has a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat).
 - Each album recorded on the Notown label has a title, a copyright date, a format (e.g., CD or MC), and an album identifier.
 - Each song recorded at Notown has a title and an author.
 - Each musician may play several instruments, and a given instrument may be played by several musicians.
 - Each album has a number of songs on it, but no song may appear on more than one album.
 - Each song is performed by one or more musicians, and a musician may perform a number of songs.
 - Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.
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|----|--|----|-----------|
| a. | Design' a conceptual schema for Notown and draw an ER diagram for your schema. The preceding information describes the situation that the Notown database must model. Be sure to indicate all key and cardinality constraints and any assumptions you make. Identify any constraints you are unable to capture in the ER diagram and briefly explain why you could not express them. | 10 | (3 :2: 3) |
| b. | Convert ER diagram to tables and normalize it up to 3NF | 10 | (3 :4: 3) |

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