

**DEPARTMENT: COMPUTER SCIENCE**

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| *Internal Assessment* | **I** | *Academic Year/Semester* | **2022-23 /IV** |
| *Subject* | **CST204-Database Management**  **Systems** | *Branch* | CSE/AI |
| *Date of Exam* | **23/03/2023** | *Duration* | **120 Min** |
| *Starting time* | **2:00 am/4:00 pm** | *Max. Marks* | **60** |

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| **PART-A (*Answer all questions, each carries 3 marks*) Max Marks: 12** | | | | |
| ***Q.No*** |  | ***Marks*** | ***CO*** | ***Level*** |
| **1** | Define Degree of relationship. Explain with suitable diagrams. | 3 | I | L2 |
| **2** | Re-draw the ER diagram replacing the (min, max) notation with the conventional notation showing cardinality and participation. | 3 | II | L2 |
| **3** | Define Cardinality Ratio, what are the possible cardinality ratios for a  binary relationship. | 3 | II | L2 |
| **4** | What role does Relational Algebra play in Relational Database Management Systems (RDBMS)? | 3 | I | L2 |

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| **PART-B (*Each question carries 12 marks)* Max Marks: 48** | | | | | | | |
| **5** | | a | | Explain the differences between DDL and DML in DBMS, and provide a suitable example for each | 4 | II | L2 |
| b | | For a car-insurance company whose customers has a Unique Customer\_id, Cust\_name, Address, Date of birth, age. A customer owns many cars, A car can be owned by a single customer .The car is identified by unique regn no, model, year & amount insured. A person as well as a car can be involved in zero to any number of accidents. The accident is recorded by a unique report number,location ,date & damage amount. Construct the E-R diagram mentioning all the attributes and also the cardinalities of relationship. | 8 | II | L3 |
| **OR** | | | | | | | |
| **6** | | a | | Briefly explain the concepts of Physical data independence & logical data independence with a typical real world example | 4 | I | L2 |
| b | | Design an ER diagram for the given scenario; Suppose that you are designing a schema to record information about reality shows on TV.Your database needs to record the following information: \_ For each reality show, its name, genre, basic\_info and participants name. Any reality show has at least two or more participants. - For each producer, the company name, company country. A show is  produced by exactly one producer. And one producer produces exactly one show. - For each television, its name, start year, head office. A television may broadcasts multiple shows. Each show is broadcasted by exactly one television. -For each user, his/her username, password, and age. A user may rate multiple shows, and a show may be rated by multiple users. Each rating has a score of 0 to 10 | 8 | II | L3 |
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| **7** | | a | | Explain the characteristics of the Database approach. How do these characteristics make the Database approach different from traditional file-based systems? | 6 | II | L2 |
| b | | Explain and differentiate types of attributes with the help of neat diagrams | 6 | II | L2 |
| **OR** | | | | | | | |
| **8** | | a | | Discuss the various types of DBMS architecture. Provide a detailed explanation of each type, accompanied by appropriate diagrams. | 6 | II | L2 |
| b | | When is the concept of a weak entity used in data modeling? Define the terms “identifying relationship”, and “partial key. | 6 | II | L2 |
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| **9** | | a | | Explain the advantages of using a database system over a file system. Compare and contrast the two systems? | 4 | I | L2 |
| b | | With the help of a neat diagram, explain the 3-schema architecture in Relational Database Management Systems (RDBMS). How does this architecture provide a framework for data independence and what are the advantages of using it? | 8 | II | L3 |
| **OR** | | | | | | | |
| **10** | **a** | | What is the difference between a super key, candidate key, primary key, and alternate key in a database? Explain with a suitable example | | 6 | II | L2 |
| **b** | | What are the different types of join operations in a database management system? Provide diagrams to illustrate each join. | | 6 | II | L2 |
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| **11** | **a** | | Synthesize below ER diagram to relational schema? | | 8 | II | L3 |
| **b** | | Describe the different types of integrity constraints that can be implemented in a database management system. | | 4 | II | L2 |
| **OR** | | | | | | | |
| **12** | **a** | | What is the Cartesian product in a database management system, and how is it used to combine data from multiple tables? | | 6 | II | L3 |
| **b** | | Create two tables in a database management system, and establish a relationship between them using SQL commands. Set appropriate constraints on the tables to ensure data consistency and accuracy.  Assume we have two tables: Employees and Departments. We want to establish a relationship between these tables such that each employee is associated with a department. | | 6 | II | L3 |

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| **Course Outcomes (CO):** |
| **CO I :** |
| **CO II :** |
| **Bloom’s Taxonomy Level:** |
| L1: Remember, L2: Understand, L3:Apply L4:Analyze |