**R V College of Engineering**
**Department of Computer Science and Engineering**
**CIE - II: Question Paper**

| **Subject : (Code)** | **Database Management Systems (CD252IA)** | **Semester : 5TH BE** |
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| **Date :07/01/2025** | **Duration :** 120 minutes | **Staff :HR/CNS/PD/SB/SNM/PH/MNV/PT** | |
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| **Name :** | **USN :** | **Section :** | **CS-A/B/C/D/CD/CY/IS/AIML** |

| S.N | **PART-A** | **M** | **BT** | **Co** |
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| 1.1 | Consider the following tables T1 and T2 , show the result of the operation<br>T1 ⋈ ( T1.P = T2.A AND T1.R = T2.C) T2<br>T1<br>P Q R<br>10 A 5<br>15 B 8<br>25 A 6<br>T2<br>A B C<br>10 b 6<br>25 c 3<br>10 b 5 | 2 | L3 | 4 |
| 1.2. | Write the 2 rules which must be satisfied , if a set of attributes FK in relation schema R1 is a foreign key of R1 that references relation R2 | 2 | L1 | 2 |
| 1.3. | Give an example for EXISTS operator of SQL(Considering the example of Insurance Database Schema of question no. 4 of PART-B) | 2 | L2 | 3 |
| 1.4 | Write reflexive, decomposition/projective inference rules for functional dependencies | 2 | L1 | 1 |
| 1.5 | What is a correlated query? Give example. | 2 | L2 | 4 |
| | **PART-B** | | | |
| 2 a. | Explain the following relational model constraints with example.<br>i Domain Constraint<br>ii Key Constraint<br>iii Entity Integrity Constraint | 6 | L1 | 2 |
| b. | Explain how the relational model constraints that may be violated by delete operation. and the types of actions that may be taken if delete operation causes a violation | 4 | L2 | 3 |
| 3 a. | Explain the relational algebra operation for set theory with examples. | 6 | L1 | 1 |
| b. | Explain DIVISION operation of relational algebra with an example. | 4 | L2 | 4 |
| 4 | Consider the Insurance Database given below.<br>PERSON (driver-id#:, name , address)<br>CAR (Regno, model, year)<br>ACCIDENT (Report-Number, date, location)<br>OWNS (driver-id#, name, Regno)<br>PARTICIPATED (driver-id#, Regno,Report_number, damageamount)<br>Write the queries in relational algebra to:<br>i Find driver-id# of every person, who owns a 'Toyota Fortuner' or a 'Hyundai Creta' car model<br>ii Find the driver-id#, name of every person who has ever been involved some car accident<br>iii Find the number of accidents in which cars belonging to each model were | 10 | L3 | 4 |

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| | involved<br>iv Find the driver-id# and name of all persons who have had all of their cars involved in some accident | | | |
| 5. | Consider the following Schema :<br>Sailors(sid: integer, sname: string, rating: integer, age: real);<br>Boats(bid: integer, bname: string, color: string);<br>Reserves(sid: integer, bid: integer, day: date)<br>Write the queries in SQL to:<br>i Find the sailors information whose name begins and ends with 'A' and has at least 3 characters.<br>ii Find the ids of sailors who have reserved a red boat or a green boat.<br>iii Find the name of sailors who have not reserved red boat<br>iv Find the ids and names of sailors who have reserved two different boats on the same day.<br>v Find the average age of sailors for each rating level that has at least two sailors. | 10 | L3 | 5 |
| 6.a. | Consider the relation scheme R = {E, F, G, H, I, J, K, L, M, N} and the set of functional dependencies {{E, F} -> {G}, {F} -> {I, J}, {E, H} -> {K, L}, K -> {M}, L -> {N} on R. What is the key for R? | 4 | L2 | 3 |
| b.. | Explain with an example Aggregate functions ,Grouping and Having clause in SQL | 6 | L2 | 1 |

**Course Outcomes:**

CO1: Understand and explore the needs and concepts of relational, NoSQL database and Distributed Architecture
CO2: Apply the knowledge of logical database design principles to real time issues.
CO3: Analyze and design data base systems using relational, NoSQL and Big Data concepts
CO4: Develop applications using relational and NoSQL database
CO5: Demonstrate database applications using various technologies.

| | L1 | L2 | L3 | L4 | L5 | L6 | CO1 | CO2 | CO3 | CO4 | CO5 |
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| Total Marks | 16 | 22 | 22 | - | - | - | 14 | 08 | 18 | 10 | - |