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

Subject : (Code)	**Database Management Systems (CD252IA)**	**Semester : 5TH BE**

Date :07/01/2025	**Duration :** 120 minutes	**Staff :HR/CNS/PD/SB/SNM/PH/MNV/PT**	
Name :	**USN** :	**Section :**	**CS-A/B/C/D/CD/CY/IS/AIML**

S.N	PART-A	M	BT	Co
1.1	<table><tr><td>P</td><td>Q</td><td>R</td><td>A</td><td>B</td><td>C</td></tr><tr><td>10</td><td>A</td><td>5</td><td>10</td><td>b</td><td>5</td></tr></table>	2	L3	4
1.2.	1.The attributes in FK have the same domain(s) as the primary key attributes 1M PK of *R*2; the attributes FK are said to reference or refer to the relation *R*2. 2. A value of FK in a tuple *t*1 of the current state *r*1(*R*1) either occurs as a value of PK for some tuple *t*2 in the current state *r*2(*R*2) *or is NULL*. In the former case, we have *t*1[FK] = *t*2[PK], and we say that the tuple *t*1 references or refers to the tuple *t*2. -1M	2	L1	2
1.3.	Nested Query – Syntax 1M Logic -1 M	2	L2	3
1.4	(reflexive rule)1: If *Y* ⊆ *X* then *X*->*Y* *1M* decomposition, or projective, rule): {*X*->*YZ*} |=*X*->*Y* -1M	2	L1	1
1.5	A correlated subquery is a subquery that contains a reference to a table that also appears in the outer query. 1M Example -1M	2	L2	4
	PART-B			
2 a.	Explain the following relational model constraints with example. i Domain Constraint Definition and example 1.5 M ii Key Constraint: Definition ,Example Key ,Super Key, Candidate Key ,Primary Key 3M iii Entity Integrity Constraint Definition and example 1,5M	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 Relational model constraints that may be violated by delete operation – Foreign Key Constraint Example and Explanation -3 M Action – Restrict, CASCADE, SET NULL, SET DEFAULT -1M	4	L2	3
3 a.	Explain the relational algebra operation for set theory with examples. Union Compatibility Definition 1.5 Example and description of operator Union ,Intersection Difference -1.5 *3 =4.5	6	L1	1
b.	Scheme Definitions R,S,T - 1,5 Definition of values in T – 1.5 M	4	L2	4

	In general, the DIVISION operation is applied to two relations $R(Z) \div S(X)$, where the attributes of R are a subset of the attributes of S; that is, $X \subseteq Z$. Let Y be the set of attributes of R that are not attributes of S; that is, $Y = Z - X$ (and hence $Z = X \cup Y$). The result of DIVISION is a relation $T(Y)$ that includes a tuple t if tuples t_R appear in R with $t_R[Y] = t$, and with $t_R[X] = t_S$ for *every* tuple t_S in S. This means that, for a tuple t to appear in the result T of the DIVISION, the values in t must appear in R in combination with *every tuple* in S. Note that in the formulation of the DIVISION Example -1M			
4	i Find driver-id# of every person, who owns a 'Toyota Fortuner' or a 'Hyundai Creta' car model $\pi_{(driver\text{-}id\#)}(\sigma_{(model='Toyota\ Fortuner'\ or\ model='Hyundai\ Creta')}(CAR * OWNS)))$ ii Find the driver-id#, name of every person has ever been involved some car accident $\pi_{(driver\text{-}id\#)}$ (PARTICIPATED) or $\pi_{(driver\text{-}id\#,name)}$ (PARTICIPATED P $\bowtie_{(P.driver\text{-}id\# = O.driver\text{-}id\#)}$ OWNS O) iii Find the number of accidents in which cars belonging to each model were involved $_{model}\Im_{count(DISTINCT\ Report\_number)}$ (PARTICIPATED $\bowtie$ CAR) iv. Find the driver-id# and name of all persons who have had all of their cars involved in some accident $R1 \leftarrow {}_{driver\text{-}id\#}\Im_{count(Regno)}(OWNS)$ $R2 \leftarrow {}_{driver\text{-}id\#}\Im_{count(DISTINCT\ Regno)}(PARTICIPATED)$ $R3 \leftarrow \pi_{(driver\text{-}id\#)}(R1 * R2)$ Or $Result \leftarrow \pi_{(driver\text{-}id\#name)}(R3 * OWNS)$ i	10	L3	4
5.	i Find the sailors information whose name begins and ends with 'A' and has at least 3 characters. **SELECT** * **FROM** Sailors **WHERE** name LIKE 'A_%A' ii Find the ids of sailors who have reserved a red boat or a green boat. **SELECT DISTINCT R.sid** **FROM Boats B, Reserves R** **WHERE R.bid = B.bid AND (B.color = 'red' or B.color = 'green')** iii Find the name of sailors who have not reserved red boat **SELECT name** **FROM Sailors** **WHERE sid NOT IN** **(SELECT R.sid** **FROM Boats B, Reserves R** **WHERE R.bid = B.bid AND B.color = 'red')** iv Find the ids and names of sailors who have reserved two different boats on the same day. **SELECT DISTINCT S.sid, S.sname** **FROM Sailors S, Reserves R1, Reserves R2** **WHERE S.sid = R1.sid AND S.sid = R2.sid AND R1.day = R2.day AND R1.bid <> R2.bid** v Find the average age of sailors for each rating level that has at least two sailors. SELECT **S.rating, AVG(S.age) AS avg_age** **FROM Sailors S** **GROUP BY S.rating** **HAVING COUNT(*) >1** i	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},	4	L2	3

	{E, H} -> {K, L}, K -> {M}, L -> {N} { E, F, H }$^{+}$ = {E, F, G, H, I, J, K, L, M, N} one of the keys. 2M Steps 2M			
b..	Explain with an example Aggregate functions ,Grouping and Having clause in SQL Expiation 3M Example -3M	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
Total Marks	16	22	22	-	-	-	14	08	18	10	-