SRN

PES University, Bengaluru
(Established under Karnataka Act No. 16 of 2013)

UE15CS252

MAY 2017: END SEMESTER ASSESSMENT B.TECH. IV SEMESTER
UE15CS252 - Database Management System

Time:3 Hrs | Answer All Questions | Max Marks: 100

1. a) With a neat block diagram, show the 3 tier architecture and explain the components. — 5

b) Assume there is a 'Shankar Darshini' in BSK - III stage, which caters to around 50 customers. It has 10 employees working for it. There are approximately 10 varieties of Dosa served in the place. Considering this situation, would you design a database for this problem, or you would prefer to use traditional file system? List any 4 reasons for your choice. — 5

c) Draw an ER diagram for the BOOK club. It has members to whom the books are sold. The books are made available at different places in the city – called Book Club Chapter – to make it easy for the members. The books are identified by a book_id, author and publisher. An author can write more than one book and a book can have more than one author. Members have information such as membership_id, name, phone_no and status. A member can place more than one order. You can choose additional attributes for the schema that seem appropriate. Mention any assumptions you make. — 8

d) Write an example for a complex attribute. — 2

2. a) Consider the sample VOTER table as given below, which records the voter details and the party that got the respective vote, in various elections.

Voter_id	Name	age	Election_type	Party_name
1	shankar	20	Assembly	AAP
2	ravi	35	General	BJP
3	arun	18	General	AAP
4	pinky	40	Assembly	BJP
5	bharati	56	Assembly	Congress

With reference to the sample values, write SQL queries for the following,

i. List the Voter name, who have voted for the first time , either in Assembly elections or General elections. (Assume the Elections are strictly held once in 5 years and age is integral value.)
ii. List the total votes secured by AAP, in Assembly elections.
iii. Display each Party and the total votes secured by each, only if the total is not less than 5000. (The total can be counted for both Assembly and General Elections together.)
iv. Make a list of voter's names, who have voted in General Elections, but not in Assembly Elections.

— 1+2+2+2

b) With reference to the above table, if we want to record the Election Year, for each entry, then What you would do? Write the same in SQL format.
If we want to record every election with its year and the voters, who have participated, then what should be the primary key for the table. — 3

c) Consider the relation schema,
ARTIST (id, name, phone_no, Art_worksDone, Year)
If we want to allow any ARTIST phone_no entry to be left blank, then how it is represented in DBMS? While querying, how do we write in SQL to list the id's of those ARTIST, who do not have their phone numbers recorded. — 2+3

d) With reference to the above schema, consider (id, Year) as the composite primary key. If we want to look at the ARTIST id and name, who have made maximum No of artworks in the year 2015. Similarly display the details for Year 2017. Can we write a single query to do this? If So, write the query. — 5

3. a) Consider the following six relations for an order-processing database application in a company:
CUSTOMER (Cust#, Cname, City)
ORDER (Order#, Odate, Cust#, Ord_Amt)
ORDER_ITEM (Order#, Item#, Qty)
ITEM (Item#, Unit_price)
SHIPMENT (Order#, Warehouse#, Ship_date)
WAREHOUSE (Warehouse#, City)
Here, Ord_Amt refers to total dollar amount of an order; Odate is the date the order was placed; Ship_date is the date an order (or part of an order) is shipped from the warehouse. Assume that an order can be shipped from several warehouses. Specify the foreign keys for this schema, stating any assumptions you make. — 05

b) Let E1 and E2 be two entities in an ER diagram with simple single-valued attributes. R1 and R2 are two relationships between E1 and E2, where R1 is one-to-many and R2 is many-to-many. R1 and R2 do not have any attributes of their own. What is the minimum number of tables required to represent this situation in the relational model? Justify your answer. — 06

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	c)	Explain the set operators in Relational algebra, with proper examples. Mention the constraints it poses.	06
	d)	The following table has two attributes A and C where A is the primary key and C is the foreign key referencing A with on-delete cascade. --- A C --- 2 4 3 4 4 3 5 2 7 2 9 5 6 4 --- Write the set of all tuples that must be additionally deleted to preserve referential integrity when the tuple (2,4) is deleted.	03
4.	a)	Student Roll_No | Student_Name 1 | Raj 2 | Rohit 3 | Raj Consider the Sample data that is given in the above table. With this, suggest the functional dependencies that hold good, with justification. Also suggest those dependencies that does not hold, noting the tuples which invalidate the dependency.	4
	b)	Relation R has eight attributes ABCDEFGH. Fields of R contain only atomic values. F={CH→G, A→BC, B→CFH, E→A, F→EG} is a set of functional dependencies (FDs). Write down all the candidate keys the relation R have.	4
	c)	If there are redundancies in a given relation then what kind of anomalies are observed here? write 2 sentences for each of these anomalies.	7
	d)	Find the minimal cover for the following set of functional dependencies. Write the steps. ABCD -> E E -> D AC -> D A -> B	5
5.	a)	10 | T1: UPDATE P1 (OLD: YYY NEW: ZZZ) 15 | T1: UPDATE P2 (OLD: WWW NEW: XXX) 20 | T2: UPDATE P3 (OLD: UUU NEW: VVV) 25 | T1: COMMIT 30 | T2: UPDATE P1 (OLD: ZZZ NEW: TTT) Above log entries are found after a system crash. If ARIES algorithm is adopted for recovery, then write the Result of the first step in the recovery.	4
	b)	User 10 is the owner of Table Emp. The owner grants these privileges, Grant insert, select on Emp to User1; Grant select, update on Emp to User2 with grant option; And User 2 issues the following statements. Grant select, update on Emp to User1; Grant select on Emp to User3; Considering these grants, List out the Users with allowed set of operations on Emp. Now, suppose User 10 takes back the privileges from User1 by a revoke statement, then what changes happen to your earlier list. In case, instead of User1, User2's privileges were revoked, then what effect will it have on your list?	2+2+2
	c)	What is the necessity of concurrency control in Transaction management? Mention any one method to achieve this control. What is the side effect of this method.	2+2+1
	d)	To ensure consistent database as end result, the transactions follow these rules. What are they?	5

P4/2