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Code No. : 14645

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD*Accredited by NAAC with A++ Grade***B.E. (I.T.) IV-Semester Main & Backlog Examinations; July-2022****Database Management Systems**

Time: 3 hours

Max. Marks: 60

*Note: Answer all questions from Part-A and any FIVE from Part-B***Part-A (10 × 2 = 20 Marks)**

Q. No.	Stem of the question	M	L	CO	PO
1.	What are three levels of Data Abstraction?	2	1	1	1
2.	Compare Physical and Logical data Independence.	2	2	1	1
3.	Write a Relational algebra query to find all customers of the bank who have an account but not a loan. Customer(Customer name, Customer_city) Borrower(Customer_name, Loan_number) Depositor(Customer_name, account_number)	2	3	2	2
4.	Write the usage of 'Order by' and 'Group by' clauses available in SQL.	2	1	2	1
5.	Define Embedded SQL.	2	1	3	1
6.	Differentiate between Full Functional Dependency and Partial Functional Dependency	2	2	3	1
7.	Draw state diagram of a transaction.	2	1	4	1
8.	Define Static Hashing.	2	1	4	1
9.	Discuss the purpose of Thomas write rule.	2	2	5	1
10.	What is a Checkpoint and when does it occur?	2	1	5	1
Part-B (5 × 8 = 40 Marks)					
11. a)	List four significant differences between a file-processing system and a DBMS.	3	2	1	1
b)	Construct an E-R diagram for a car insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. Each insurance policy covers one or more cars, and has one or more premium payments associated with it. Each payment is for a particular period of time, and has an associated due date, and the date when the payment was received.	5	3	1	2

12. a)	Demonstrate with an examples various types of JOIN operations.	3	2	2	1
b)	Consider the employee database .Give an expression in SQL for each of the following queries. employee (employee name, street, city) works (employee name, company name, salary) company (company name, city) manages (employee name, manager name) a) Find the names and cities of residence of all employees who work for "First Bank Corporation". b) Find the names, street addresses, and cities of residence of all employees who work for "First Bank Corporation" and earn more than \$10,000. c) Find those companies whose employees earn a higher salary, on average, than the average salary at "First Bank Corporation".	5	3	2	2
13. a)	Define Integrity Constraints.Consider the following relational schema: Student(snum: integer, sname: string, major: string, level: string, age: integer) Class(name: string, meets at: time, room: string, fid: integer) Enrolled(snum: integer, cname: string) Faculty(fid: integer, fname: string, deptid: integer) Given an SQL DDL definition of this database. Identify appropriate referential integrity constraints.	4	3	3	2
b)	Consider the relation R (A, B, C, D, E) with the set of function dependencies. $F = \{AB \rightarrow C, D \rightarrow E, A \rightarrow D\}$ i) Find out whether R is in 3NF or BCNF. Justify. ii) Consider the decomposition of R into R1 (A, B, C) and R2 (A, D, E). Is the decomposition lossless and dependency preserving? Justify.	4	4	3	2

14. a)	Give an example of an Extendible Hashing index in which deleting an entry reduces the global depth.	4	2	4	1
b)	Consider the precedence graph given below. Is the corresponding schedule conflict serializable? Explain your answer.	4	3	4	2
<pre> graph TD T1((T1)) --> T2((T2)) T1 --> T4((T4)) T2 --> T3((T3)) T2 --> T4 T4 --> T5((T5)) T3 --> T5 </pre>					
15. a)	What is a lock based protocol? List the types of locks and explain the two phase locking protocol.	4	2	5	1
b)	Explain Timestamp-based protocols with an example.	4	2	5	1
16. a)	Compare Specialization and generalization along with an example.	4	2	1	1
b)	<p>Consider the following schema.</p> <p>SUPPLIERS (SID: INTEGER, SNAME: STRING, SADDRESS: STRING) PARTS (PID: INTEGER, PNAME: STRING, COLOR: STRING) CATALOG (SID: INTEGER, PID: INTEGER, COST: NUMBER)</p> <p>Write the Queries using Relational Algebra Operations:</p> <p>i) List the names of suppliers who supply same blue parts.</p> <p>ii) List the pids of parts that are supplied by at least two different suppliers.</p> <p>iii) List all the pids of parts supplied by supplier with sid = 200.</p>	4	3	2	2

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17.	Answer any <i>two</i> of the following:	
a)	<p>Consider the bank database.</p> <p>branch(branch name, branch city, assets)</p> <p>customer (customer name, customer street, customer city)</p> <p>loan (loan number, branch name, amount)</p> <p>borrower (customer name, loan number)</p> <p>account (account number, branch name, balance)</p> <p>depositor (customer name, account number)</p> <p>Write an SQL trigger to carry out the following action: On delete of an account, for each owner of the account, check if the owner has any remaining accounts, and if they does not, delete them from the depositor relation.</p>	4 4 3 2
b)	List ACID properties and illustrate its significance along with an example.	4 1 4 1
c)	When does a Deadlock occur and explain what type of schemes are used to handle.	4 2 5 1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%
