(iii) Each employee consists of e_id, ename, address, gender, date of birth, qualification and position within the company

(iv) Each route has route_no, origin destination, classification [domestic/ international], price

(v) Each airline records information about each of its aircraft buy/sell transactions, each transaction has Trans_ID, date, description and amount paid/ received. Each employee works for exactly one airline. Airlines assign different aircraft on different routes. Each airline makes one or more transactions. Each transaction is associated with exactly one airline.

29. a. Explain in detail about relational algebra operations with example. 12 4 4 2

**(OR)**

b. Write SQL queries for the following: 12 4 4 2

Department: {dno, dname, location}

Employee; {eno, ename, designation, manager, join_date, salary, dno}

(i) Find the total salary of the managers from employee table for each department

(ii) Find the ename, designation, salary of all employees those who are paid the same or more than the employee 'ARTHI'

(iii) Find the location of the department where "Krishnan' works

(iv) Find the ename which includes 'D' and sort the ename field in descending order

(v) Find all the employees who have the same job as 'Peter'

(vi) Remove all the employee records who are working in 'HR' department

30. a. Compare 3NF and BCNF with suitable examples. 12 3 5 3

**(OR)**

b. Explain in detail about 1NF and 2NF with suitable examples. 12 3 5 3

31. a. Explain in detail about query optimization algorithms with suitable examples. 12 3 5 3

**(OR)**

b. Illustrate the types of storage systems and also explain the pros and cons of various types of storage systems. 12 3 5 3

32. a. Explain in detail about two phase locking techniques with suitable examples. 12 3 6 1

**(OR)**

b. Describe about MAC and RBAC models. 12 3 6 1

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**B.Tech. DEGREE EXAMINATION, MAY 2023**

Fourth Semester

18CSC267J – DATABASE MANAGEMENT SYSTEMS

*(For the candidates admitted during the academic year 2018-2019 to 2021-2022)*

**Note:**

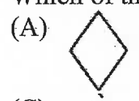
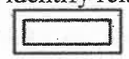
(i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.

(ii) **Part - B & Part - C** should be answered in answer booklet.

Time: 3 hours Max. Marks: 100

**PART – A (20 × 1 = 20 Marks)**

Answer **ALL** Questions

| | Marks | BL | CO | PO |
|---|---|---|---|---|
| 1. DML is provided for _____. (A) Description of logical structure of database (B) Addition of new structures in the database systems (C) Manipulation and processing of database (D) Definition of physical structure of database system | 1 | 1 | 1 | 1 |
| 2. The separation of the data definition from the program is known as _____. (A) Data dictionary (B) Data independencies (C) Data integrity (D) Referential integrity | 1 | 1 | 1 | 1 |
| 3. Which of the following symbol represents identify relationship? (A)  (B)  (C)  (D)  | 1 | 1 | 2 | 1 |
| 4. Which of the following is not the advantages of a DBMS? (A) Improved ability to enforce standards (B) Improved data consistency (C) Local control over the data (D) Minimal data redundancy | 1 | 1 | 1 | 1 |
| 5. Pick the correct query to display the list of unique parents who attended the parents meet program in this institution. (A) Select * from parent_meet; (B) Select parent_name from parent_meet; (C) Select list(parent_name) from parent_meet; (D) Select distinct(parent_name) from parent_meet; | 1 | 2 | 4 | 3 |
| 6. In order to merge two or more strings, which string function is used? (A) Char (B) Alter (C) Concat (D) Merge | 1 | 1 | 4 | 1 |

7. PL/SQL variables are by default 1 1 4 1
   (A) Case sensitive (B) Upper case sensitive
   (C) Lower case sensitive (D) Not case sensitive

8. Which of the following statement is true about full outer join created on two tables table 1 and table 2? 1 1 4 1
   (A) Retrieves all the unmatched rows of table 1 (B) Retrieves all the unmatched rows of table 2
   (C) Retrieves both matched and unmatched rows of table 1 and table 2 (D) Retrieves only matched rows of table 1 and table 2

9. Identify the rule of NF2. 1 2 5 2
   (A) Satisfied NF1 (B) Satisfies NF1 and no partial dependencies
   (C) No need to satisfy NF1 and no partial dependencies (D) Satisfies NF1 and no transitive dependency

10. Which of the following NF does not need dependency? 1 2 5 2
   (A) NF1 (B) NF2
   (C) NF4 (D) NF5

11. If W→X, X→Y, XA→B then which of the below is false? 1 2 5 2
   (A) WZ→XZ (augmentation) (B) W→Y (transitivity)
   (C) WA→B (pseudo transitivity) (D) Y→X (reflexivity)

12. What is the following functional dependency represents
   House price → Area 1 1 5 1
   (A) Area functionally depends on house price (B) House price functionally depends on area
   (C) House price defines area (D) Area defines house price

13. _____ have the distinguishing characteristics of not affecting the data in the event of a system crash or failure, but a disk failure can easily damage or destroy the stored data. 1 1 5 1
   (A) Flash memory (B) Magnetic disks
   (C) Optical storage (D) Tape storage

14. A database is _____ to reduce the number of disk access needed to process queries in order to improve performance. 1 1 5 1
   (A) Non-indexed (B) Indexed
   (C) Inserted (D) Updated

15. How many columns are there in structure of index? 1 1 5 1
   (A) 2 (B) 3
   (C) 4 (D) 5

16. Which statement is used to verify optimer operation? 1 1 5 1
   (A) Analyze (B) Verify
   (C) Explain (D) Show



17. In two phase locking, locks are acquired and granted in _____. 1 1 6 3
   (A) Growing phase followed by shrinking phase (B) Growing phase
   (C) Shrinking phase (D) Shrinking phase followed by growing phase

18. The transaction's _____ guaratees that the transaction will be successfully executed. 1 1 6 3
   (A) Concurrency (B) Reliability
   (C) Atomicity (D) Serializability

19. Through which system, we can detect SQL injection attacks? 1 1 6 1
   (A) Injection detection system (B) Attack detection system
   (C) Intrusion detection system (D) Error monitor

20. A logical counter is _____ after a new timestamp has been assigned 1 1 6 1
   (A) Incremented (B) Decremented
   (C) Doubled (D) Remains the same

**PART – B (5 × 4 = 20 Marks)** Marks BL CO PO
Answer **ANY FIVE** Questions

21. Compare physical and logical data independence. 4 3 1 1

22. Brief about domain relational calculas. 4 3 2 1

23. Explain the purpose of Armstrong's axioms with suitable examples. 4 3 4 1

24. Brief about types of storage systems. 4 3 5 1

25. Define ACID properties with suitable examples. 4 3 6 1

26. Illustrate the levels of abstraction with neat sketch. 4 3 1 1

27. Describe about views. Give on SQL query to retrieve the Chennai living customers from customer database. 4 4 4 2

**PART – C (5 × 12 = 60 Marks)** Marks BL CO PO
Answer **ALL** Questions

28. a. Illustrate the database system structure with neat sketch. 12 3 1 1

**(OR)**

b. Draw a ER diagram for the following requirement and convert the same into table structure. 12 4 2 1

An airline company that provides passenger services and maintains a database with information about all airlines.
The information consists of:
(i) Each airline has id_no, name and address, contact person name, telephone number
(ii) Each aircraft has an id_no, capacity and a model