| Reg. No. | | | | | | | | | | | | | | | |
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**B.Tech. DEGREE EXAMINATION, MAY 2024**

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. The conceptual model is _____.<br>(A) Dependent on hardware (B) Dependent on software<br>(C) Dependent on both hardware and software (D) Independent on both hardware and software | 1 | 1 | 2 | 3 |
| 2. ◎ symbol represents _____ type of attribute.<br>(A) Derived (B) Composite<br>(C) Multivalued (D) Single | 1 | 1 | 2 | 3 |
| 3. The predominant way of storing data today is using which type of database models?<br>(A) Hierarchical (B) Relational<br>(C) Network model (D) Object oriented | 1 | 1 | 1 | 1 |
| 4. Key to represent relationship between tables is called _____.<br>(A) Primary key (B) Secondary key<br>(C) Foreign key (D) Candidate key | 1 | 1 | 2 | 3 |
| 5. You can delete a view by using the _____ statement<br>(A) Delete view (B) Drop view<br>(C) Drop delete view (D) Delete drop view | 1 | 2 | 3 | 1 |
| 6. In SQL character pattern matching, 'A%A' what it represents?<br>(A) Matches any string starts and ends with 'A' (B) Matches exact 3 characters with starting and ending with A<br>(C) Matches the text for second character may be anything (D) Matches the string starts with 'A' | 1 | 2 | 4 | 3 |
| 7. What type of join the following query belongs to?<br>Select emp.eid, dept.did, name from emp,dept where emp.did = dept.did<br>(A) Non equi join (B) Outer join<br>(C) Equi join (D) Inner join | 1 | 2 | 4 | 3 |

8. Which one of the following is used with select clause to fetch all columns from a table? 1 1 4 1
   (A) All (B) *
   (C) Distinct (D) as

9. A relation is in _____ if an attribute of a composite key is dependent on an attribute of other composite key. 1 1 5 1
   (A) 2NF (B) 3NF
   (C) BCNF (D) 1NF

10. Let R = (P,Q,S,T,U,V) be a relational schema with the following dependencies, S→V, U→P, US→T, P→Q. Identify the key for R. 1 2 5 3
   (A) ST (B) UT
   (C) PU (D) PS

11. Which of the following statements true for normal forms? 1 1 5 1
   (A) BCNF is stricter than 3NF (B) 3NF is stricter than BCNF
   (C) Transitive functional dependency holds for 3NF (D) Table contains multiple values

12. Consider the relational schema A(W,X,Y,Z) the functional dependency W→X and Y→Z are decomposed into A1(WX) and A2 (YZ) is 1 2 5 3
   (A) Lossy decomposition (B) Dependency preserving and lossy decomposition
   (C) Lossess join and dependency preserving (D) Dependency preserving but not lossless join

13. The file organization that provides vary fast access to any arbitrary record of a file is _____. 1 1 5 1
   (A) Ordered file (B) Unordered file
   (C) B-tree (D) Hashed file

14. Optical disk technology uses 1 1 5 1
   (A) Helical scanning (B) DAT
   (C) RAID (D) A laser beam

15. Key value pairs is usually seen in 1 1 5 1
   (A) Hash table (B) Heaps
   (C) Skip lists (D) Trees

16. Ensuring isolation property is the responsibility of the _____. 1 1 5 1
   (A) Recovery management component of the DBMS (B) Concurrency control component of the DBMS
   (C) Transaction management component of the DBMS (D) Buffer management component in DBMS

17. In the _____ phase the system replays updates of all transactions by scanning the log forward from the last checkpoint. 1 1 6 2
   (A) Undo (B) Repeat
   (C) Redo (D) Replay

18. Which kind of failure, loses its data in head crash or failure during transfer operation? 1 1 6 1

(A) Transaction failure (B) System crash
(C) DBNode crash (D) Disk failure

19. When the transaction finishes the final statement the transaction enters into _____. 1 1 6 3

(A) Active state (B) Committed state
(C) Partially committed state (D) Abort state

20. SQL injection is an attack in which _____ code is inserted into strings that are later passed to an instance of SQL server. 1 1 6 3

(A) Malicious (B) Redundant
(C) Clean (D) Non malicious

**PART – B (5 × 4 = 20 Marks)** Marks BL CO PO

Answer **ANY FIVE** Questions

21. Discuss about levels of abstraction with neat diagram. 4 3 1 1

22. List any five group functions in SQL. Give an example for each function. 4 3 4 2

23. What are the pitfalls in relational database design? Discuss about dependency preservation. 4 3 4 1

24. Mention the types of outer joins with suitable SQL query. 4 3 4 3

25. Describe about SQL injection. 4 3 6 3

26. Compare physical and logical data independence. 4 3 2 1

27. Write a PL/SQL program to find the factorial of a given number. 4 3 4 2

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

Answer **ALL** Questions

28. a. Explain various types of data models with suitable examples. 12 3 1 1

**(OR)**

b. Construct an ER diagram for the following scenario and also correct the design into table structure. 12 3 1 1

A restaurant system consists of a menu entity which includes menuid, description, item name, unit price which should connect with order entity. Customer entity includes cid, name, Email, state, contact_no, restaurant table booking may by in the category of ordinary / AC dining. Payment entity includes pay_id, name, time, which connecting the order entity. A customer can book multiple orders.

29. a. Explain about algebraic operations with suitable expressions. 12 4 4 3

**(OR)**

| | | | | | |
|---|---|---|---|---|---|
| b. | Consider the relation<br>• Emp (Ename, Eid, Salary, department, designation, manager_id)<br>• Grade (Grade level, highest_sal, lowest_sal)<br>(i) Write the SQL query to find the average salary paid to employees working in each department<br>(ii) Write the SQL query to print the details of employee and their managers<br>(iii) Write the SQL query to print grade level in ascending order<br>(iv) Display the employee names who are all working in the same designation of 'Mr.Raghu'.<br>(v) Remove all the records who are all in grade/level 'C'<br>(vi) Increase 5% of salary for the employees working in 'HR' department | 12 | 4 | 4 | 3 |
| 30. a. | Given a relation R(P,Q,R,S,T,U,V,W,X,Y) and functional dependency set FD = (PQ→R, R→ST, Q→U, U→VW and S→XY), determine whether the given R is in 3NF? If not convert it into 3NF. | 12 | 4 | 5 | 3 |
| | **(OR)** | | | | |
| b. | Explain in detail about 2NF and 3NF with suitable examples. | 12 | 4 | 5 | 3 |
| 31. a. | Categorize the various types of RAID levels and explain it in detail with neat diagram. | 12 | 3 | 5 | 4 |
| | **(OR)** | | | | |
| b. | Illustrate ordered indices and explain in detail about dense index files and sparse index file. | 12 | 3 | 5 | 1 |
| 32. a. | Write short note on<br>(i) DAC<br>(ii) MAC | 12 | 3 | 6 | 1 |
| | **(OR)** | | | | |
| b. | What is concurrency control? Also explain how 2 phase locking ensures serializability. | 12 | 3 | 6 | 1 |

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