6. a) What is a Transaction? What are the ACID properties? 6+4=10
   b) Differentiate between dense index and sparse index.

7. a) Explain the concurrency control scheme based on validation technique. 5+5=10
   b) what are the different causes of failure in a database system?

8. Define the following terms: 10
   (i) Carinality of a relation
   (ii) Shadow paging
   (iii) Checkpoints
   (iv) Timestamp Ordering Protocol
   (v) Candidate key

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BACHELOR OF COMPUTER APPLICATION
SECOND SEMESTER
RELATIONAL DATABASE MANAGEMENT SYSTEM
BCA-202

(Use separate answer scripts for Objective & Descriptive)

Duration : 3 hrs. **Full Marks : 70**

(PART-A : Objective)

Time : 20 min. **Marks : 20**

Choose the correct answer from the following: ***1X20=20***

1. The data model which describes how the data is actually stored is
   a. Internal model b. External model
   c. Logical model d. None of the above

2. Which of the following is an aggregate function in SQL?
   a. AVG b. ORDER BY
   c. SELECT d. None of the above

3. The number of columns associated with the table or relation is called a
   a. Degree b. Domain
   c. Keys d. None of the above

4. A view of a database that appears to an application programmers view is known a
   a. Schema b. Subschema
   c. Virtual table d. None of the above

5. What is the full form of DDL?
   a. Dynamic data language b. Detailed data language
   c. Data definition language d. None of the above

6. _____ expresses the specific number of entity occurrences associated with one occurrence of the related entity.
   a. Connectivity b. Degree
   c. Cardinality d. None of the above

7. Which of the following is a column in the table whose purpose is to uniquely identify records from a different table?
   a. Primary key b. Candidate key
   c. Foreign key d. Intelligent key

8. Which of the following is a valid relationship in the relational database model?
   a. One-to-one b. One-to-many
   c. Many-to-many d. All of the above

9. Which of the following is a valid SQL data type?
   a. VARCHAR2 b. NUMERIC
   c. FLOAT d. All of the above

10. Which of the following is not true?
    a. A relation is in BCNF if it is in 4NF
    b. BCNF is stricter than 3NF
    c. A relation is in BCNF if every determinant of the relation is a candidate key
    d. All are true

11. When all non key attributes are dependent on the key attribute, it is called_____ dependency.
    a. Full Functional
    b. Functional
    c. Transitive
    d. Partial

12. Along with GROUPBY clause, one can use the _____ clause to define a condition.
    a. UPDATE
    b. HAVING
    c. UNIQUE
    d. EXIST

13. Which one is not a function of DBA?
    a. Granting of authorization for data access
    b. Schema Definition
    c. Integration with file manager
    d. Storage structure and access method definition

14. In object oriented model, an object can access data of another object by passing-
    a. Instance variable
    b. Message
    c. Variable
    d. None of these

15. Which of the following transaction property is known as all or nothing property?
    a. Atomicity
    b. Isolation
    c. Consistency
    d. All of these

16. Which of the following is an optimistic concurrency control scheme?
    a. Lock-based
    b. Timestamp ordering
    c. Validation based
    d. None of these

17. In which of the following scheme, log is updated before the database?
    a. Write-ahead logging
    b. Checkpoint
    c. Transaction log
    d. None of these

18. Which of the following step is not involved in processing a query?
    a. Parsing and translation
    b. Optimization
    c. Evaluation
    d. Distribution

19. In _____ recovery system, two page tables are maintained during the life of a transaction.
    a. Mirroring
    b. Shadow-paging
    c. Both of these
    d. None of the above

20. Which of the following is not a set operator?
    a. UNION
    b. INTERSCTION
    c. LIKE
    d. MINUS

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(PART-B : Descriptive)

Time : 2 hrs. 40 min. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. a) Define attributes. Explain different types of attributes with example of each. 4+6=10
   b) Design an E-R Diagram for a hospital management system.

2. a) What are the main differences between a traditional file processing system and a database system? List 4 advantages and 4 disadvantages of RDBMS. 4+4+2=10
   b) What is HDBMS?

3. a) Describe the 3 schema architecture along with suitable diagram. Explain each level of the architecture. 7+3=10
   b) What do you mean by data independence? Explain.

4. a) If X and Y are two relations as shown below: 4+6=10

X			Y		
a	b	c	b	c	a
d	c	a	e	d	f
b	f	e	b	f	e

   Find: a) XUY b) X∩Y c) X-Y d) XxY

   b) Consider the following table structures:
   S_PERSON(S_NO, S_NAME, COMMISSION)
   PRODUCT(P_ID, DESCRIPTION)
   SALE(DATE,C_NO,S_NO,P_ID,QTY)
   CUSTOMER(C_NO,C_NAME,C_ADD)
   Answer the following queries in relational algebra:
   (i) Get the names of the salesman who sol product no 48
   (ii) Get the names of those customers who brought table lamps, in addition to other products.

5. a) Define normalization. Explain Third Normal Form (3NF) with an example. How does BCNF differ from 3NF? 7+3=10
   b) Explain the Selection and Projection operation of Relational Algebra with example.