

iii) What separates the physical aspects of data storage from the logical aspects of data representation ?

- a) Data
- b) Schema
- c) Constraints
- d) Relationships.

iv) What is a set of possible data values called ?

- a) Degree
- b) Domain
- c) Field
- d) Cardinality.

v) What is the smallest unit of data in relational model ?

- a) Data type
- b) Field
- c) Data value
- d) None of these.

vi) Which of the following is a comparison operator used in SELECT statement ?

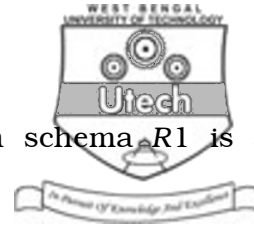
- a) LIKE
- b) BETWEEN
- c) IN
- d) None of these.

vii) A relationship between the instances of a single entity type is called

- a) Binary relationship
- b) Ternary relationship
- c) Recursive relationship
- d) none of these.



- viii) The word 'loss' in lossless decomposition refers to the
- a) Loss of information      b) Loss of attributes
- c) Loss of relations      d) none of these.
- ix) When all the columns in a relation describe and depend upon the primary key, the relation is said to be in
- a) 1 NF      b) 2 NF
- c) 3 NF      d) 4 NF
- x) The first phase of query processing is
- a) Decomposition      b) Restructuring
- c) Analysis      d) none of these.
- xi) Which of the following query processing methods is more efficient ?
- a) Pipelining      b) Materialization
- c) Tunnelling      d) None of these.
- xii) Which index is specified on the non-ordering fields of a file ?
- a) Primary      b) Clustering
- c) Secondary      d) None of these.



xiii) If a set of attributes  $K$ , in relation schema  $R1$  is a foreign key for  $R1$  then

- a) every tuple of  $R1$  has a distinct value of  $K$
- b)  $K$  is a key for some other relation
- c)  $K$  cannot have a null value for tuples in  $R1$
- d)  $K$  is a primary key for  $R1$ .

xiv) The buffer in which all the commands that are types are stored is

- a) View
- b) Edit
- c) Window
- d) Tristate.

xv) Whenever two independent one-to-many relationships are mixed in the same relation, a ..... arises.

- a) Functional dependency
- b) Multivalued dependency
- c) Transitive dependency
- d) None of these.



**GROUP – B**  
**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

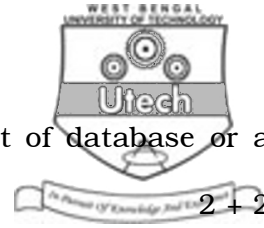
2. Discuss inconsistency read problem in concurrent transaction processing.
3. Discuss database security.
4. Discuss ACID property of database.
5. What is normalization and why is it required ?
6. Discuss the steps used in query processing.

**GROUP – C**  
**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

7. Discuss different database recovery techniques.
8. a) What is cascading rollback ? 2  
b) What is schedule ? What are conflicting schedules ?  
State and explain the conditions under which two schedules will be in conflict. 2 + 2 + 3  
c) Discuss the advantages and disadvantages of distributed database. 6

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9. a) What is critical section ? Is it a part of database or a part of running code ? 2 + 2

b) What are semaphores ? Explain with examples the functioning of a ninth level semaphore for blocking a user in entering the critical section that is already preoccupied. 2 + 6

c) What are triggers ? 3

10. Consider the following *three* relationships :

Faculty ( faculty\_id, name, specialization, subject 1, subject 2 )

Students ( student \_id, name, branch, year )

Subjects ( subject \_id, faculty \_id, student \_id )

Write an SQL query to

i) list subject followed by the student name who has opted for the subject.

ii) show the names of the faculty and the students against each subject.

iii) that produce list of these subjects opted by less than 15% of the students. 3 + 4 + 8



11. Write short notes on any *three* of the following : 3 × 5

- a) Temporal database
  - b) Shadow paging
  - c) 3-phase commit
  - d) Views in database
  - e) Embedded SQL.
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