

**MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL**

Paper Code : BCAC401 Database Management System

UPID : 400086

Time Allotted : 3 Hours

Full Marks : 70

*The Figures in the margin indicate full marks.**Candidate are required to give their answers in their own words as far as practicable***Group-A (Very Short Answer Type Question)**

1. Answer any ten of the following :

{ 1 x 10 = 10 }

- (I) Data about the data is known as _____.
- (II) Not applicable condition can be represented in relation entry as _____.
- (III) Command that is used to add attributes to an existing relation, is _____.
- (IV) To select a tuple from a relational database table, the symbol used in a relational algebra is _____.
- (V) State one of the causes of the failure of file system.
- (VI) The main goal of indexing is to _____.
- (VII) A transaction can proceed only after the concurrency control manager _____ the lock to the transaction.
- (VIII) In relational model, rows are referred to as _____.
- (IX) An entity set that does not have sufficient attributes to form a primary key is termed a _____.
- (X) _____ Command will remove the records from the table, but not affect the structure of the table.
- (XI) A relation is considered to be in second normal form if it is in first normal form and it has no _____ dependencies.
- (XII) Files of unordered record are called _____.

Group-B (Short Answer Type Question)

Answer any three of the following :

{ 5 x 3 = 15 }

2. What is data abstraction? How is data abstraction achieved in DBMS? [5]
3. What are mapping constraints in DBMS? Explain with example. [5]
4. What is difference between DDL DML and DCL in SQL? [5]
5. What is functional dependency? Explain full functional dependency and trivial functional dependency with examples. [5]
6. What is data independence? How is physical data independence different from logical data independence? Explain with example. [5]

Group-C (Long Answer Type Question)

Answer any three of the following :

{ 15 x 3 = 45 }

7. (a) What is the difference between the database schema and database instance? Which of them is more liable to change frequently and why? [3+2]
- (b) Explain hierarchical, relational and network database model with example. [5]
- (c) What is data dictionary? Explain its importance. [5]
8. (a) What is the relationship between a weak and a strong entity set? [5]
- (b) Explain foreign key with an example. [3]
- (c) Construct an ER Diagram for a Company having following details : [7]
 - Company organized into departments. Each department has unique name and a particular employee who manages the department. Start date for the manager is recorded. Department may have several locations.
 - A department controls a number of projects. Projects have a unique name, number and a single location.
 - Company's employee name, employee no, address, salary, sex and birth date are recorded. An employee is assigned to one department, but may work for several projects (not necessarily controlled by his/her dept). Number of hours/week an employee works on each project is recorded; the immediate supervisor for the employee is also recorded.

- Employee's dependent are tracked for health insurance purposes (dependent name, birth date, relationship to employee are recorded).
9. (a) "All primary keys are the super key but the converse is not true"-clarify the statement. [5]
- (b) What is "NULL" in DBMS? [5]
- Explain Cursors and triggers in DBMS.
- (c) Consider the SBR relations below with candidate key underlined: [5]
- Sailors (Sid: integer, Sname: String, Rating: integer, Age: real)
- Boats (Bid: integer, Bname: String, Color: String)
- Reserves (Sid: integer, Bid: integer, day: Date)
- Find the Relational Algebra of the following query using above SBR relations.
- (i) Find the names of sailors who have reserved at least two boats.
- (ii) Find the name of sailors with age over 20 who have not reserved a red boat.
10. (a) What are the basic issues in the design of an ER database schema? [4]
- (b) What is a key in DBMS? What are the different keys used in DBMS? Explain each of them with example. [5]
- (c) Take a single example of a database and explain the relationship between primary key, candidate key and foreign key in that example database. [6]
11. (a) What is a system catalog? What do you mean by entity integrity and domain integrity in relational model? [5]
- (b) What is a DBMS, and how does it differ from a file management system? [5]
- (c) What do you mean by data integrity and consistency? Explain with example. [5]

*** END OF PAPER ***

<https://www.makaut.com>
 Whatsapp @ 9300930012
 Send your old paper & get 10/-
 अपने पुराने पेपर्स भेजे और 10 रुपये पायें,
 Paytm or Google Pay से