



HALDIA INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION UNDER MAULANA ABUL KALAM AZAD UNIVERSITY OF TECHNOLOGY, WEST BENGAL)

Paper Code: PCC-CS 501

Paper Name: Database Management Systems

Time Allotted: 3 Hours

Full Marks: 70

The figures in the margin indicate full marks

Candidates are required to give their answers in their own words as far as practicable

Group – A

(Multiple Choice Type Questions)

Choose the correct alternatives from the followings:

15 x 1 = 15

1. (i) In which of the following formats data is stored in the database management system? [CO-1]

- a) Image b) Text c) Table d) Graph

(ii) Which of the following is not a type of database? [CO-1]

- a) Hierarchical b) Network c) Distributed d) Decentralized

(iii) Which of the following is not an example of DBMS? [CO-3]

- a) MySQL b) Microsoft Access c) IBM DB2 d) Google

(iv) What is information about data called? [CO-1, CO-5]

- a) Hyper data b) Tera data c) Meta data d) Relations

(v) What does an RDBMS consist of? [CO-1, CO-2]

- a) Collection of Records b) Collection of Keys c) Collection of Tables d) Collection of Fields

(vi) The ability to query data, as well as insert, delete, and alter tuples, is offered by _____ [CO-3, CO-5]

- a) TCL (Transaction Control Language) b) DCL (Data Control Language)
c) DDL (Data Definition Language) d) DML (Data Manipulation Language)

(vii) Which command is used to remove a relation from an SQL? [CO-3, CO-5]

- a) Drop table b) Delete c) Purge d) Remove

(viii) Procedural language among the following is _____ [CO-2]

- a) Domain relational calculus b) Tuple relational calculus
c) Relational algebra d) Query language

(ix) Which of the following establishes a top-to-bottom relationship among the items? [CO-1, CO-4]

- a) Relational schema b) Network schema
c) Hierarchical schema d) All of the mentioned

(x) Data Manipulation Language (DML) is not to [CO-5]

- a) Create information table in the Database b) Insertion of new information into the Database
c) Deletion of information in the Database d) Modification of information in the Database

(xi) The minimal set of super key is called [CO-1, CO-3]

- a) Primary key b) Secondary key c) Candidate key d) Foreign key

(xii) A type of query that is placed within a WHERE or HAVING clause of another query is called [CO-3]

- a) Super query b) Sub query c) Master query d) Multi-query

(xiii) Related fields in a data base are grouped to form [CO-1, CO-5]

- a) Data file b) Data record c) Menu d) Bank

(xiv) The distinguishable parts of a record are called [CO-1 , CO-5]

- a) Files b) Data c) Fields d) Database

(xv) In SQL, which command(s) is(are) used to enable/disable a database trigger? [CO-3, CO-5]

- a) ALTER TRIGGER b) ALTER DATABASE
c) ALTER TABLE d) MODIFY TRIGGER

Group – B

(Short Answer Type Questions)

Attempt any three from the followings:

3 x 5 = 15

2. Explain the advantage of modern DBMS over Conventional file processing System. [5] [CO-1]

3. Define Super key, candidate key, primary key, foreign key, alternate key, unique key with example. [CO-2 , CO-3][5]

4. What are properties of relation decomposition? Explain with suitable example. [5]
[CO-2 , CO-6]

5. Explain in brief the Codd's algebraic rules for DBMS. [CO-5 , CO-6] [5]

6. Write Armstrong's Axioms and explain the mathematical significance of it. [CO-2] [5]

Group – C

(Long Answer Type Questions)

Attempt any four from the followings:

4 x 10 = 40

7. a) Consider the Relation R(A, B, C) and a set of functional dependencies
 $F = \{A \rightarrow BC, A \rightarrow B, AB \rightarrow C\}$ Compute the Canonical Cover of F

b) Every relation in BCNF also on 3NF, prove with an example.

[5+5]

[CO-3]

8. a) Create a B Tree of Order 5 by inserting the following elements.
4, 15, 7, 1, 8, 5, 12, 17, 13, 6, 23, 12

b) Explain Conflict Serializability with example. [CO-4, CO-6]

[5+5]

9. Consider the relational database. Give an expression in the relational algebra to express each of the following queries:

Employee (person-name, street, city),

Company (company-name, city)

Works (person-name, company-name, salary),

Manages (person-name, manager-name)

a) Find the names of all employees who work for First Bank Corporation.

b) Find the names, street address, and cities of residence of all employees who work for First Bank Corporation and earn more than Rs. 10,000 per annum. Find the names of all employees in this database who live in the same city as the company for which they work.

c) Assume the companies may be located in several cities. Find all companies located in every city in which Small Bank Corporation is located. [CO-1, CO-3] [2+5+3]

10. a) What is the difference between primary and secondary index? b) How does multilevel indexing improve the efficiency of searching an index file? Explain with an example.

c) How does B tree differ from B+ tree? Which one is preferred? [CO-4]

[3+3+4]

11. a) Explain the ACID property of transaction.

b) Draw the state diagram of a transaction and explain. c) Discuss in brief the two-phase locking (2PL) protocol. What are the limitations of 2 PL? [CO-5, CO-6] [3+3+4]

12. Write short notes [Any Two]

a) Natural Join Operation

b) Pipelining

c) 3 schema architecture

d) Object-oriented data models [CO-1, CO-2]

[5+5]

Answer Key:

Group – A

1.(i)	c	(ii)	d	(iii)	d	(iv)	c	(v)	c	(vi)	d
(vii)	a	(viii)	c	(ix)	c	(x)	a	(xi)	c	(xii)	b
(xiii)	b	(xiv)	c	(xv)	a						

Group – B

Group – C

Note:

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Don't put anything in the header caption (**Red mark line**)

Put exact Paper Code and Paper Name.

Don't put any True/False type question in MCQs.

Don't put less / extra options in MCQs.

Repetition of question is highly prohibited.

Paper setters are requested to put answer of each question in the “Answer Key” section only. Don't highlight/put any answer in the question section.