



Program: Diploma in Computer Engineering/
Information Technology

Full Marks: 80

Year/Part: II/II (2022) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.



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Attempt any **EIGHT** questions.

1. a. Define database management system. Explain DDL, DML and DCL. [2+3]
b. Differentiate between centralize database system and distributed database system. Define ER diagram and its importance/need. [3+2]
2. Explain relationship types. Draw an ER diagram of "Hospital Management System". [3+7]
3. Define primary key and foreign key. Explain normalization and different database normal forms with examples. [2+8]
4. a. Define integrity and domain constraints. Describe SQL with its features. [3+2]
b. Explain relational algebra. Define join, semi-join and sub queries with an example. [2+3]
5. Define relational algebra and relational calculus. From the given table perform the following operations: [4+6]

EmpID	Name	Gender	Salary
101	Shantanu	M	20,000
102	Sudip	M	25,000
103	Binita	F	18,000
104	Sangita	F	19,000

- a. Write a query to show the employee list whose name starts with 'S'. www.arjun00.com.np

- b. Write a query to find the average and sum of salary.
- c. Write a query to delete the employee record whose salary is less than 19,000.
6. Define transaction. Explain about ACID properties of transaction. [2+8]
7. What is crash recovery? Explain concurrency control and two phase lock protocol. [2+4+4]
8. Define shadow paging. Explain log based recovery and shadow paging technique. [2+8]
9. Write short notes on: (any TWO) [2×5]
- a. Functional dependencies
 - b. DBMS Vs RDBMS
 - c. File processing system

Good Luck !



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Council for Technical Education and Vocational Training

Office of the Controller of Examinations

Sanothimi, Bhaktapur

Regular/Scholarship Exam - 2080 Magh/Phagun

Program: Diploma in Computer Engineering/
Information Technology

Full Marks: 80

Year/Part: II/II (2022) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.



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Attempt any **EIGHT** questions.

1. Define database and database schema. Differentiate between centralized and distributed database system. [2+8]
2. What is database normalization? Explain about different normal forms with suitable examples. [2+8]
3. Design an ER diagram for online shopping platform. [10]
4. Define entity set and relationship set. Explain different types of SQL JOIN. [4+6]
5. Define relational algebra and relational calculus. Create a table given-below and perform the following operations: [2+8]
Trainee (t_no, t_name, t_department, salary)
 - a. Create a table trainee.
 - b. Insert a record.
 - c. Find the trainee name whose salary is greater than 30,000.
 - d. Delete a record from table whose name starts from R.
6. What is query processing? Explain different steps involved in query processing. www.arjun00.com.np [2+8]
7. What is transaction in database? Explain strict 2PL with an example. [3+7]
8. What is log based recovery? Explain undo and redo protocols. [2+8]
9. Write short notes on: (any **TWO**) [2×5]
 - a. Types of database users
 - b. Primary key and foreign key
 - c. Shadow paging
 - d. Domain constraints

Good Luck !



Program: Diploma in Computer Engineering

Full Marks: 80

Year/Part: II/I (2018) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.



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Attempt Any Eight questions.

1. Explain database management system. Describe the advantages of using the DBMS approach. [4+6]
2. Define data independence. Explain logical and physical data independence. [10]
3. Describe terms attribute, entity, weak entity, key relation. [10]
4. Draw E-R diagram for patient information system. [10]
5. What do you mean by data constraints? Explain primary key constraint and foreign key constraints. [10]
6. Create a table given below and perform the following operations. [10]
teacher (t_no, t_name, t_faculty, salary)
i) Create given table teacher.
ii) Find the teacher name whose salary is greater than 25,000.
iii) Insert a record into given table.
iv) Delete a record from given table whose name is Rohan Sharma. www.arjun00.com.np
7. What is data normalization? Describe 1NF and 2NF. [10]
8. Write short notes on : (Any Two) [2x5=10]
a) Encryption and decryption
b) Transaction processing
c) Database recovery
9. Differentiate between DDL and DML [10]

Good Luck !



Program: Diploma IT/Computer Engineering

Full Marks: 80

Year/Part: II/I (2018 New Course) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Attempt All questions.



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1. a) Write down the advantages of using DBMS approach. [5]
b) Explain Three-schema Architecture with a neat diagram. [5]
2. a) Draw an E-R diagram of "Library Management system." [6]
b) Explain client / server architecture for DBMS. [4]
3. a) Consider the following Sailors, Boats and Reserves Table. [6]

Sailors

Sid	Sname	Rating	Age
1	Harry	10	23
2	Maft	9	25
3	David	8	27
9	Eric	10	29
11	Sam	9	30

Boats

Bid	Bname	Color
24	Titanic	Red
33	Edu	Blue
41	Clipper	Black

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Reserves

Sid	Bid	Day
1	24	2019-12-10
1	22	2019-12-15
11	41	2019-12-18
9	24	2019-12-23

Cont.....

- i. Write the query to show the savors whose name ends with "ry"
 - ii. Write the query to show the sailors ID who reserved a Red boat.
 - iii. Write the query to show the sailors with name 'Matt' or the rating equal 9.
-
- b) Explain different kinds of join operations of relational algebra. [4]
4. a) What is normalization? Explain about 1NF, 2NF and 3NF. [6]
- b) Define transaction processing. What are the desirable properties of transactions? [4]
5. a) Explain SQL. List the basic SQL queries with example. [6]
- b) Explain testing for serializability with respect to concurrency control schemes. How will you determine whether a schedule is serializable or not? [4]
6. a) What are constraints? Explain their types. [6]
- b) What is need of security in DBMS? Explain in brief about encryption and decryption. [4]
7. a) Explain the roles of DBA. [6]
- b) What do you mean by attributes and keys in ER diagram? Explain with example. [4]
8. a) What is Two-phase locking? Explain Timestamp ordering Techniques [6]
- b) Explain in brief about functional dependencies and its types. [4]

Good Luck!



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Office of the Controller of Examinations

Sanothimi, Bhaktapur

Regular/Back Exam-2079, Bhadra /Ashwin

Program: Diploma in IT Engineering

Full Marks: 80

Year/Part: II/I (2016) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Attempt Any Eight questions.



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1. Define terms data, information, database and DBMS. [10]
2. What are various types of data models? Explain them. [10]
3. Explain ER diagram with its symbol. Draw E-R diagram of "School Management System". [4+6]
4. Consider the relation schema: [4×2.5]
Student (stu_name, stu_no, program, address)
Write down queries to:
 - a) Find all students who study in IT program.
 - b) Find all students whose name start with "A".
 - c) Find all students whose student number is greater than 20 and study in Civil program.
 - d) Find all students who have "BI" or "KA" in their names.
5. Define relational database. Explain different types of keys. [3+7]
6. What are integrity constraint? Explain about different domain constraints. [2+8]
7. What is normalization? Explain 1NF, 2NF and 3NF. [2+8]
8. What is difference between authentication and authorization? [5+5]
Explain types of authorization.
9. Write short notes on: (Any Two) [2×5=10]
 - a) ACID properties of transaction.
 - b) Centralized Vs Distributed database
 - c) Referential Integrity

Good Luck!



Council for Technical Education and Vocational Training
Office of the Controller of Examinations
Sanothimi, Bhaktapur
Regular/Back Exam-2078, Kartik/Mangsir

Program: Diploma in Computer Engineering

Full Marks: 80

Year/Part: III/I (2018 New Course) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs

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

The figures in the margin indicate full marks.

Attempt Any Eight questions.



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1. Define terms data, information, database and DBMS. [10]
2. What are the different types of data models? Explain any two of them in brief. [10]
3. Explain ER diagram. What are entity, attributes and keys? Describe different types of relationship. [4+2+4]
4. Draw ER diagram for Hotel Management System where customers check in and check out of the room. Hotel also contains pre-booking facility. [10]
5. Define SQL in brief. [10]

EMPLOYEE

Emp id	Name	Salary	Address
101	Ravi Regmi	2000	Butwal
102	Keshab Bashyal	8000	Kathmandu
103	Angeeta Rijal	20,000	Surkhet
104	Rajeev Khadka	10,000	Gulmi

Write the table given as above.

- a) Write a query to show the employee name list from table whose name starts with "R".
 - b) Write a query to show the employee whose salary is greater than 8000. www.arjun00.com.np
6. Why normalization is needed in database. Explain 1NF, 2NF, 3NF. [10]
 7. What is transaction? Explain ACID properties of transaction. [10]
 8. Write short notes on : (Any Two) [2x5=10]
 - a) Advantages of DBMS approach
 - b) Relational Mapping
 - c) Data recovery
 9. Explain two-Phase Locking and Time-stamp Ordering Techniques. [10]

Good Luck !



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Office of the Controller of Examinations
Sanothimi, Bhaktapur

Regular/Back Exam-2077, Chaitra

Program: Diploma in Computer Engineering

Full Marks: 80

Year/Part: II/II (2013 Old Course) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs

Candidates are required to give their answers in Nepali or English as far as practicable. The figures in the margin indicate full marks.



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Attempt Any Eight questions.

1. a) What is database Management System? Explain the roles and responsibilities of Database administrator (DBA). [2+4]
b) Differentiate between Centralized and distributed database. [4]
2. a) What is data abstraction? What are the advantages of database over traditional file processing? [6]
b) Discuss the 3 tier architecture of DBMS in brief. [4]
3. What is an ER diagram? Why do we need it? Draw an ER diagram for database showing Hospital system. The hospital maintains data about affiliated hospitals, type of treatment facilities given at each hospitals and patients. [10]
4. a) What is SQL? Explain Data Manipulation Language (DML) and Data Definition Language (DDL). [5]
b) Explain 2NF and 3NF with example. [5]
5. Consider the following relational schema where primary key are underlined: www.arjun00.com.np [10]
Doctor (DName, Reg-no) Patient (Pname, Disease)
Assigned To (Pname, Dname)
Give expression in both SQL and Relational Algebra for each of the Queries:
a) Get the names of patients who are assigned to more than one doctor.

Cont.....

- b) Get the names of doctor who are treating patient with " polio" [4]
6. a) Explain the distinction among terms primary key, candidate key and superkey. [6]
b) Explain ACID properties with the help of example. [6]
7. a) What are physical and logical data independence? Explain. [4]
b) Explain with diagram steps of Query processing. [6]
8. a) Why do we need security in DBMS? Explain Encryption and Decryption [6]
b) Explain sequential file Organization with diagram. [4]
9. a) Explain the term crash recovery and write its importance. [4+2]
b) What do you understand by Lock based protocols? Explain. [4]

Good Luck !



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Council for Technical Education and Vocational Training

Office of the Controller of Examinations

Sanothimi, Bhaktapur

Regular/Back Exam-2076, Falgun/Chaitra

Program: Diploma in Computer Engineering

Full Marks: 80

Year/Part: III/I (New Course) © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs

Candidates are required to
practicable. The figures in the



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Attempt **Any Eight** Questions

1. What is database? Write down the objectives of DBMS. [2+3+5]
Explain the role of database administrator.
2. Explain E-R diagram with its symbol. Draw E-R diagram of [4+6]
"Hospital Management system".
3. What is an attribute? Define one to one and many to many [2+8]
relationship. Draw ER diagram of library management system.
4. Consider the schema of employee table below: [10]
Employee (E-id, Name, Address, Salary, Department)
a) Write a query to add new data in the table.
b) Write a query to find detail of employee whose salary in
between 1000 and 5000.
c) Find the employee whose name starts with "E"
d) Update the employee salary by 15% whose Department is
"Sales".
e) Find employee name whose salary is highest.
5. What is normalization? Explain 1NF, 2NF and 3NF with suitable [2+8]
example.
6. Why security is needed? Explain access control, authorization, [2+8]
encryption and decryption.
7. Describe sequential and indexed sequential file organization. [5+5]
What is query processing and optimization? Explain.
8. Why is backup necessary? Explain various backup measures [2+8]
that needs to be performed for crash recovery.
9. Write Short notes on: (**Any Two**) [2x5=10]
a) Centralized Vs Distributed database management system
b) Relational Database Model.
c) Properties of Transaction Processing
d) SQL

Good Luck!



Council for Technical Education and Vocational Training

Office of the Controller of Examinations

Sanothimi, Bhaktapur

Regular/Back Exam-2076, Shrawan/Bhadra

Program: Diploma in Computer Engineering

Full Marks: 80

Year/Part: II / II (2010) © Arjun

Pass Marks: 32

Subject: Database Management system (DBMS)

Time: 3 hrs

Candidates are required to give their answers in a neat and practicable manner. The figures in the margin indicate the marks.



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Attempt All questions.

1. a) Describe the evolution and characteristics of database approach. [5]
b) Explain the database system architecture with neat diagram. [5]
2. a) Construct the ER diagram for hospital with a set of patients and set of medical doctors. Associate with each patient a log of the various tests & examinations conducted. [6]
b) Differentiate between Relational algebra & Relational calculus. [4]
3. a) Consider the employee database, where primary keys are underlined: [6]
Employee (Ename, street, city)
Works (Ename, compname, salary)
Company (Compname, city)
Managers(Ename, Management)

Write SQL for following:

- (a) Find the name of all employee who works for NMR corporation. www.arjun00.com.np
- (b) Find the names, street address, and cities of residence of all employees who work for NMR corporation and earn more than 200,000 per annum.
- (c) Find the name of all employee who live in the same city as the company for which they work.
- (d) Count the total no. of employees who work for NMR corporation with salary more than 50,000.
- b) Explain about projection and selection operations of relational algebra with examples. [4]

Contd.....

- 4.a) What is normalization? Explain about 1NF, 2NF and 3NF. [6]
b) What are integrity constraints? Explain about domain constraints. [4]
5.a) Explain about the different states of transaction. [4]
b) Explain testing for serializability with respect to concurrency control schemes. How will you determine whether a schedule is serializable or not?
6.a) Briefly explain the steps involved in query processing. [6]
b) What is the need of security in DBMS? Explain in brief about encryption & decryption.
7.a) What is storage device? Explain different types of storage devices. [6]
b) What are attributes? Explain in brief different types of attributes. [4]
8.a) What is the need of filing? Explain in brief about hash and heap piling. [5+5]
b) Explain the concept of shadow paging. [4]

Good Luck!



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Regular/ Back 2075 Shrawan / Bhadra

Program: Diploma in Computer Engineering

Full Marks:80

Year/ Part: II/II © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3 hrs.

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



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Attempt Any Eight Questions.

1. What is database? Write down the applications of database. Explain DBMS with its objectives. [5+5]
2. What are the symbols used in E-R diagram? Draw an E-R diagram of "School management system. [3+7]
3. What are the advantages of database over simple file system? Explain the role of DBA. [4+6]
4. Describe SQL in brief. [4+6]

EmpID	Name	Salary
1000	Sarswoti Thapa	15000
1001	Milan K.C.	20000
1002	Bipin Sharma	13000
1003	Suresh Dharmi	14000

With the given table as above,

- a) Write the query to show the employees list whose name starts with "S".
 - b) Write the query to show the employee whose salary is less
5. Why we need normalization? Explain 1NF and 2NF with example. [2+4+4]
 6. Explain cache and main memory. Explain about sequential and indexed sequential file organization. [4+6]
 7. Describe access control and authorization in database system. Explain encryption and decryption in detail. [4+6]
 8. Define query processing in detail. Explain query optimization process in detail. [5+5]

Contd....

9. What is crash recovery? Explain log based recovery and shadow paging technique. [2+6]
10. Write short notes on (Any Two): [2x5]
- a) Primary key and foreign key
 - b) Buffer management
 - c) DML

Good Luck !



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Council for Technical Education and Vocational Training
Office of the Controller of Examinations
Sanathimi, Bhaktapur
Regular/Back Exam-2074, Shrawan/Bhadra

Program: Diploma in Computer Engineering

Full Marks: 80

Year/Part: II/II © Arjun

Pass Marks: 32

Subject: Database Management System

Time: 3:00 hrs

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.



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Attempt ALL Questions

1. Define data, database, and database system. Explain about different level of data abstraction with suitable diagram. 3+5
2. What is ER diagram? Draw an ER diagram for a banking enterprise that keeps the information about employee, customer, loan, account and payment. 2+6
3. Define the term attribute, tuple, relation and degree. Differentiate between relational calculus and relational algebra. 4+4
4. Consider the following Employee relation and write SQL command for following question. 8

E_ID	Name	Address	Salary	Department
101	John	Bhaktapur	12,000	sales
102	Jack	Lalitpur	14,000	admin
103	Hari	Bharatpur	9,000	production
104	Ram	Pokhara	17,000	sales

- a. Write a query to add new data in the table .
- b. Write a query to find the detail of employee whose salary in between 10,000 and 15,000.
- c. Find all employees whose address ends with 'pur'.
- d. Update the employee salary by 20% whose E_ID is 103.

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Contd....

5. What do you mean by normalization? Why it is needed? Explain 1NF and 2NF with suitable example. 2+2+4
6. Describe access control and authorization in database system. What is encryption and decryption? 6+2
7. What is query decomposition? Explain different steps involved in query processing. 2+6
8. What is transaction and transaction processing? Explain ACID properties of transaction. 3+5
9. What is crash recovery? Explain log based recovery and shadow paging technique. 2+6
10. Write short notes on: (any two) 4+4
- a. Buffer Management
 - b. Scheduling and Serializability
 - c. Centralized and Distributed Database
 - d. Data Independence



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Council for Technical Education and Vocational Training
Office of the Controller of Examinations
Sanathimi, Bhaktapur

Regular/Back Exam-2073 Bhadra/Ashwin

Program: Diploma in Computer Engineering

Year/Part: II/II (New Course)

Subject: Database Management System
(DBMS) © Arjun

Full Mark:80

Pass Mark:32

Time: 3 hrs.

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



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Attempt Any Five Questions.

1. a. Define data and information. Differentiate between centralized and distributed database. [2+6=8]
b. Define database administrator and data dictionary. [4+4=8]
List the characteristics of database approach
2. a. Explain record based and object based data models. [8]
b. Explain ER-diagram and Schema diagram with suitable example. [8]
3. a. Explain structure and importance of relational database. Define selection, projection, Cartesian product and join in relational algebra. [4+4=8]
b. Define normalization. Explain 1NF, 2NF, 3NF with suitable example. [2+6=8]
4. a. Why security is needed in DBMS? Explain Access control, Authorization, Encryption and Decryption. [2+6=8]
b. Explain Query processing and optimization. [8]
5. a. Explain sequential and indexed sequential file organization. [8]
b. Define crash recovery. Explain log-based recovery and backup-recovery. [2+6=8]
6. a. What is the importance of concurrency control? Explain scheduling and serializability. [4+4=8]
b. Write short notes on: www.arjun00.com.np [2x4=8]
 - i. Structured Query Language
 - ii. Data Manipulation Language

Good Luck!



Council for Technical Education and Vocational Training

Office of the Controller of Examination

Sanothimi, Bhaktapur

Regular/Back Exam – 2072, Bhadra/Ashwin

Program: Diploma in Computer Engineering (New Course)

Full Marks: 80

Year/Part: II/II

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Pass Marks: 32

Subject: Database Management System (DBMS) Time: 3 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.



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Attempt any Eight Questions

1. Define data, information, database and database management system. [10]
2. What are the advantages of Database over the simple file system? Explain role of database administrator. [5+5=10]
3. Explain ER Diagram. Create a simple ER diagram for a library management system where student borrows book from library and returns it back. [10]
4. With the concept of relational algebra, describe the following operations [10]
 - a. UNION www.arjun00.com.np
 - b. INTERSECT
 - c. MINUS (DIFFERENCE)
 - d. SELECTION
 - e. PROJECTION

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5. Describe SQL in brief.

[10]

EmpID	Name	Salary
901	Apsara	5000
902	Rajan	6400
908	Ravi	9000
909	Sashi	19000

With the table given as above,

- Write the query to show the employee list whose name starts with "S"
- Write the query to show the employee whose salary is greater than 8500

6. Why is normalization required? Explain 1NF, 2NF and 3NF [10]

7. Explain cache and main memory. Differentiate sequential and indexed sequential file organization. [10]

8. What is transaction and transaction processing? Explain scheduling and serializability. [10]

9. Why is backup necessary? Explain various backup measures that needs to be performed for crash recovery. [10]

10. Write short notes on (any two) [2x5=10]

- Database schema
- DDL
- Query optimization



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The End

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