B2.2-R4: INTRODUCTION TO DBMS

NOTE:

1. There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.

2. **PART ONE** is to be answered in the **TEAR-OFF ANSWER SHEET** only, attached to the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book.

3. Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the answer sheet for **PART ONE** is returned. However, candidates, who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the answer sheet for **PART ONE**.

TOTAL TIME: 3 HOURS **TOTAL MARKS: 100**

(PART ONE – 40; PART TWO – 60)

PART ONE
(Answer all the questions)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "tear-off" answer sheet attached to the question paper, following instructions therein. (1x10)

1.1 Description of data stored in database is called
A) Schema
B) Meta Data
C) Information
D) None of the above

1.2 When one transaction updates a database item and then transaction fails for some reason. The updated item is accessed by another transaction before it is changed back to its original value is a
A) Lost update
B) Temporary update
C) Incorrect summary
D) None of the above

1.3 In Databases, Redundancy leads to the following problems
A) Inconsistency
B) Duplication of effort
C) Accuracy
D) Inconsistency as well as duplication of efforts

1.4 Which one of the following is necessarily an example of 1:1 relationship?
A) employee-assigned_to-Department
B) BANK-has-Branches
C) College-has-Principal
D) None of the above

1.5 Degree of a relationship is
A) Number of relationship instances
B) Number of participating entities in that relationship
C) Number of attributes of a relationship
D) None of the above

1.6 Constraints inherited in every schema of that model is called
A) Schema based
B) Application based
C) Model based
D) None of the above

1.7 If X ->Y holds then
A) X determines Y uniquely
B) Y determines X uniquely
C) Both A) and B) are true
D) None of the above

1.8 The write ahead logging (WAL) protocol simply means that
A) The writing of data item should be done ahead of any logging operation
B) The log record for an operation should be written before the actual data is written
C) All log records should be written before a new transaction begin
D) The log never needs to be written

1.9 The following command is used to change the structure of the table.
A) UPDATE
B) ALTER
C) MODIFY
D) None of the above

1.10 Two relations $R(a_1,a_2\ldots a_n)$ and $S(b_1,b_2\ldots b_a)$ are said to be union compatible if
A) Their degree is same
B) $dom(A_a)=dom(B_a)$ $1<=i<=n$
C) Both A) and B) are true
D) None of the above

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "tear-off" sheet attached to the question paper, following instructions therein. (1x10)

2.1 Role names are required in recursive relationships.
2.2 Key attributes can have NULL values.
2.3 Every relation has a super Key.
2.4 In Generalization/specialization every entity from super class has to be part of the sub class.
2.5 DELETE command is used to remove the table from a data base.
2.6 Intersection operation can be expressed by using UNION and MINUS operations.
2.7 TRUNCATE is a DDL command used to deletes all the rows from a table.
2.8 Derived attributes are stored in database.
2.9 Key constraints specify that primary key values can not be NULL.
2.10 We can guarantee that BCNF relational schema will be produced by dependency preserving decomposition of non-BCNF relational schemas.

3. Match words and phrases in column X with the closest related meaning/ word(s)/phrase(s) in column Y. Enter your selection in the "tear-off" answer sheet attached to the question paper, following instructions therein. (1x10)

X		Y	
3.1	Process of defining new classes from already existing class is called	**A.**	Truncate
3.2	If entity in super class cannot exist in more than one sub class then all sub classes are	**B.**	Deferred update
3.3	Storing the same data multiple time leads to	**C.**	ARIES recovery algorithm
3.4	The maximum number of relationship instances that an entity can participate in is called	**D.**	Discretionary Access Control (DAC)
3.5	Capacity to change conceptual schema without making changes in External schema	**E.**	Degree
3.6	It is a DDL command and deletes all the rows from a table. All memory space for that table is also released	**F.**	Disjoint
3.7	A transaction cannot change the database on disk until it reaches the commit point	**G.**	Specialization
3.8	Steal/No force approach for writing	**H.**	Delete
3.9	Vulnerability to malicious attack	**I.**	Join
3.10	This operation can violate Referential Integrity Constraint	**J.**	Data Independence
		K.	Weak entity
		L.	Cardinality Ratio
		M.	Redundancy

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Enter your choice in the "tear-off" answer sheet attached to the question paper, following instructions therein. (1x10)

A.	DML	**B.**	Serial	**C.**	Application
D.	LIKE	**E.**	Model	**F.**	BETWEEN
G.	WHERE	**H.**	Having	**I.**	High Level
J.	Representational	**K.**	SELECT	**L.**	DDL
M.	Group by				

4.1 ER modeling is an example of _____ data model.

4.2 The _____ operation of SQL is an example of unary operation.

4.3 The _____ operator is used for Pattern matching.

4.4 The _____ operator is used to specify a range of values.

4.5 Joining condition is specified in the _____ clause.

4.6 Schedules A and B are called _____ because the operations of each transactions are executed consecutively.

4.7 Collection of concepts used to describe the structure of a database is called database _____.

4.8 _____ commands are used to create tables and schemas.

4.9 Constraints that cannot be directly expressed in schema are called _____ based constraints.

4.10 To provide a condition on group of tuples associated with each value of the Grouping attribute, _____ clause is used.

PART TWO

(Answer any **four** questions**)**

5.

a) Design an ER diagram for Bank database. The database designer provides the following description:
   i) Each bank has a unique name, code and address and it can have multiple branches.
   ii) Store each customer's detail(Name, address, phone number)
   iii) Store Accounts details (Account number, type , Balance)
   iv) Also store details of the Loans taken by the customers
   Specify Min-Max constraints.
   State clearly any additional assumptions you make

b) What is a referential integrity constraint? Why do we need it.? Explain with the help of suitable example.

(9+6)

6.

a) Consider a relation R(A,B,C,D,E) with the following dependencies:
   AB->C, CD->E, DE->B
   Is AB the candidate key of the relation? Explain your answer.

b) Consider a relation R(A,B,C,D,E,F,G,H,I,J) with the following dependencies:
   AB->C
   A->D,E
   B-> F
   F->G,H
   D->I,J
   What is the key for R? Decompose the relation in to 2NF and 3NF.

c) What is Dependency Preserving decomposition? Explain.

(4+7+4)

7.

a) What is a schedule? Define the concepts of recoverable, cascade less and strict schedule and compare them in terms of their recoverability.

b) How checkpoints are used in database recovery?

c) What are the main differences between designing a Relational database and Object database?

(6+4+5)

8.

a) Consider the following database:

STUDENT

ROLLNO	NAME	COURSENO	ADDRESS
1	Roma Singh	10	10, Morris Nagar
2	Megha Chowdhary	20	101, Civil Lines
3	Anita Goyal	10	23, Under Hill Road

COURSE

CNO	CNAME
10	B.Sc.(H) Computer Science
20	MCA
30	M.Sc Computer science.

Write the following queries in SQL:

i) Write a query to display Name and Course Name of all the students who have opted for B.Sc. (H) computer Science.
ii) Write a query to display Number of students in each course.
iii) Write a query to display total number of students in all the courses.
iv) Write a command to add one more field SectionNo to table STUDENT.

b) Explain total and partial participation of an entity in a relationship with the help of examples.
c) What is data Independence? Explain.

(6+5+4)

9.

a) Does a DBMS allow propagating privileges? Explain with the help of an example.
b) What is dummy inbuilt table in Oracle?
c) What is the difference between GRANT and REVOKE command?

(6+3+6)