A7/B2.2-R4 : INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

अवधि : 03 घंटे **अधिकतम अंक : 100**
DURATION : 03 Hours **MAXIMUM MARKS : 100**

ओएमआर शीट सं. : **OMR Sheet No. :**					

रोल नं. : **Roll No. :** | | | | | | |

उत्तर-पुस्तिका सं. : **Answer Sheet No. :** | | | | | | |

परीक्षार्थी का नाम : **परीक्षार्थी के हस्ताक्षर :**
Name of Candidate : _____; **Signature of Candidate :** _____

परीक्षार्थियों के लिए निर्देश :	**Instructions for Candidate :**
कृपया प्रश्न-पुस्तिका, ओएमआर शीट एवं उत्तर-पुस्तिका में दिये गए निर्देशों को ध्यानपूर्वक पढ़ें।	Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
प्रश्न-पुस्तिका की भाषा अंग्रेजी है। परीक्षार्थी केवल अंग्रेजी भाषा में ही उत्तर दे सकते हैं।	Question Paper is in English language. Candidate can answer in English language only.
इस मॉड्यूल/पेपर के **दो भाग** हैं। **भाग एक** में **चार** प्रश्न और **भाग दो** में **पाँच** प्रश्न हैं।	There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
भाग एक ''वैकल्पिक'' प्रकार का है जिसके कुल अंक 40 है तथा **भाग दो** ''व्यक्तिपरक'' प्रकार का है और इसके कुल अंक 60 है।	**PART ONE** is Objective type and carries 40 Marks. **PART TWO** is Subjective type and carries 60 Marks.
भाग एक के उत्तर, इस प्रश्न-पत्र के साथ दी गई **ओएमआर उत्तर- पुस्तिका** पर, उसमें दिये गए अनुदेशों के अनुसार ही दिये जाने हैं। **भाग दो** की उत्तर-पुस्तिका में **भाग एक** के उत्तर **नहीं** दिये जाने चाहिए।	**PART ONE** is to be answered in the **OMR ANSWER SHEET** only, supplied with the Question Paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**.
भाग एक के लिए अधिकतम समय सीमा **एक घण्टा** निर्धारित की गई है। **भाग दो** की उत्तर-पुस्तिका, **भाग एक** की उत्तर-पुस्तिका जमा कराने के पश्चात् दी जाएगी। तथापि, निर्धारित एक घंटे से पहले **भाग एक** पूरा करने वाले परीक्षार्थी **भाग एक** की उत्तर-पुस्तिका निरीक्षक को सौंपने के तुरंत बाद, **भाग दो** की उत्तर-पुस्तिका ले सकते हैं।	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** to the Invigilator.
परीक्षार्थी, उपस्थिति-पत्रिका पर हस्ताक्षर किए बिना और अपनी उत्तर-पुस्तिका, निरीक्षक को सौंपे बिना, परीक्षा हॉल/कमरा नहीं छोड़ सकते हैं। ऐसा नहीं करने पर, परीक्षार्थी को इस मॉड्यूल/पेपर में अयोग्य घोषित कर दिया जाएगा।	**Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the Invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
प्रश्न-पुस्तिका को खोलने के निर्देश मिलने के पश्चात् एवं उत्तर लिखना आरम्भ करने से पहले उम्मीदवार जाँच कर यह सुनिश्चित कर लें कि प्रश्न-पुस्तिका प्रत्येक दृष्टि से संपूर्ण है।	After receiving the instruction to open the booklet and before starting to answer the questions, the candidate should ensure that the Question Booklet is complete in all respect.

जब तक आपसे कहा न जाए, तब तक प्रश्न-पुस्तिका न खोलें।
DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

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 "OMR" answer sheet supplied with the question paper, following instructions therein. **(1x10=10)**

1.1 Create, Alter and Drop are example of :

(A) DML

(B) DQL

(C) DCL

(D) DDL

1.2 Dr. E.F. Codd gave :

(A) 12 Rules

(B) 10 Rules

(C) 13 Rules

(D) 11 Rules

1.3 What is the cardinality of a table with 50 rows and 5 columns ?

(A) 50

(B) 5

(C) 250

(D) 25

1.4 The entity set that participate in an relationship :

(A) May or may not be distinct

(B) Is distinct

(C) Need not be distinct

(D) None of these

1.5 Which of the following is the set-oriented operation ?

(A) Select

(B) Difference

(C) Division

(D) Project

SPACE FOR ROUGH WORK

1.6 Intersection operation is :

(A) Commutative

(B) Associative

(C) Both (A) and (B)

(D) None of these

1.7 Which of the operator selects values that match any value in a given list of values ?

(A) Between

(B) Like

(C) In

(D) Having

1.8 An attribute X may be functionally dependent on :

(A) A single Attribute Y

(B) A composite attribute (X, Y)

(C) Both (A) and (B)

(D) None of these

1.9 The process of Normalization is :

(A) Reversible

(B) Non-reversible

(C) Iterative

(D) Recursive

1.10 ACID stands for :

(A) Again, Common, Internal, Data

(B) Atomic, Common, Internal, Data

(C) Atomic, Consistent, Isolation, Durability

(D) Again, Consistent, Isolation, Durability

SPACE FOR ROUGH WORK

2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and ENTER in the "OMR" answer sheet supplied with the question paper, following instructions therein. **(1x10=10)**

2.1 A table can also be called as relation.

2.2 Relational calculus is a formal declarative language.

2.3 SQL is a procedural language.

2.4 If the candidate keys imply every join dependency in a table, then it is in the fifth Normal form.

2.5 IT is not essential to remove redundant FD's to find the Canonical Cover.

2.6 Candidate Key is not the minimal subset of the attributes.

2.7 Join and Cartesian product are used to retrieve values from multiple tables with no difference.

2.8 SUM, MAX, MIN are also called as Aggregate Function which are used in SQL.

2.9 Aggregation is an abstraction in which relationship sets are treated as higher level entity sets.

2.10 Shadow paging is one of the Log-based recovery techniques used for recovery in the databases.

3. Match words and Phrases in Column X with the closest related Meaning/Words/Phrase in column Y. Enter your selection in the OMR answer sheet supplied with the question paper, following instruction therein. **(1x10=10)**

X		Y	
3.1	Removal of duplicates	**A.**	Foreign Key
3.2	Wild cards	**B.**	Having Clause
3.3	Referential integrity constraint	**C.**	Primary Key
3.4	Overall Logical structure of databases	**D.**	Distinct
3.5	Fourth Normal form	**E.**	Between - and
3.6	Entity integrity Rule	**F.**	%, _
3.7	One-to-one	**G.**	Inference Rules
3.8	Range Operator	**H.**	Schema
3.9	Augmentation rule	**I.**	Count
3.10	Group By Clause	**J.**	Mapping cardinality
		K.	( )
		L.	Subschema
		M.	MVD

4. Each statement below has a blank space to fit one of the words or phrase in the list below. Enter your selection in the OMR answer sheet supplied with the question paper, following instruction therein. **(1x10=10)**

A.	DDL	**B.**	View	**C.**	DCL
D.	2NF	**E.**	Tuple	**F.**	Transaction
G.	DML	**H.**	Log Tail	**I.**	DBA
J.	Log Head	**K.**	Specialization	**L.**	MINUS
M.	BCNF				

4.1 A _____ is a set of operation that must be performed completely or not at all.

4.2 Data is processed by using _____.

4.3 _____ is a logical table that derives data from other tables.

4.4 Each row of the table is known as _____.

4.5. ROLLBACK, COMMIT AND SAVEPOINT are _____.

4.6 The essential requirement of _____ normal form is that every determinant in the relation must be a candidate key.

4.7 The most recent portion of the Log, which is kept in main memory is called _____.

4.8 The person who is responsible for overall security of the Database is called as _____.

4.9 The process of defining sub groups of the given entity type is known as _____.

4.10 The operation that is used to retrieve those tuples present in one relation and not present in another relation is _____.

PART TWO

(Answer Any FOUR questions.)

5. (a) What are weak entity sets ? How are they mapped into relational table ?

(b) What is meant by database systems ? What are the advantages and disadvantages of this system ?

(c) Explain Mapping cardinalities in detail.

(5+5+5=15)

6. (a) Consider the following database tables and answer queries using SQL.

Employee (Emp#, Name)

Assigned_to (Project#, Emp#)

Project (Project#, Project_Name, Chief_architect)

1. Print the Details of the employee working on project "AAA"

2. Print the employee number of employee who work on all projects.

3. Print the emp# of employee other than employee 39 who work on at least one project that employee 39 works on.

(b) What is Relational Algebra ? Explain the various Join operations performed in Relational algebra.

(9+6=15)

7. (a) Draw an E-R diagram to show the management of the Insurance Company stating any assumptions you make to show all the key features of the E-R modeling concept.

(b) What is database security ? Why is it important ? Also discuss the various security issues.

(9+6=15)

8. (a) Consider a relation schema R with set F of Functional dependencies

{A→BC, CD→E, E→C, D→AEH, ABH→BD, DH→BC}

Find the non-redundant cover of F.

(b) Consider the Universal relation R(A, B, C) and the set of FD's :

AB→C, C→A

Show that R is in 3NF but not in BCNF.

(c) A relation R(A, B, C, D, E) has the following set of FD's :

AB→CD, A→E, C→D

Is the decomposition of R in R1(A, B, C), R2(B, C, D) and R3(C, D, E) is lossy or not ?

(5+5+5=15)

9. (a) What are undo and redo operations ? Why do these need to be idempotent ?

(b) What information is maintained by the recovery manager during normal execution of transactions ?

(9+6=15)

- o 0 o -

SPACE FOR ROUGH WORK