Sl. No.

B2.2-R4 : INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

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 सकता है।	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; each question carries ONE mark)

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 What is a wild card character used when conducting searches in a database ?

(A) !

(B) *

(C) <

(D) =

1.2 What is a relationship in which there is one record in one table that can have many matching records in another table ?

(A) One-to-many

(B) Many-to-many

(C) One-to-one

(D) All of the above

1.3 What is the benefit of using a query language rather than a natural language to get information out of a database ?

(A) Query language are more flexible than natural language

(B) There is no benefit of query languages over natural languages for getting information out of a database

(C) Query languages allow the user to pose unstructured, open ended queries

(D) Query languages are more precise so there is less room for misinterpretation

1.4 Which SQL operator would you use to match field values to a template value

(i.e. finding all customers with a last name starting with "G") ?

(A) MASK

(B) STARTS WITH

(C) LIKE

(D) HAVING

1.5 The ability to modify the data structure without changing the programs using that data is called _____.

(A) Data integrity

(B) Data dictionary

(C) Referential integrity

(D) Data independence

1.6 The role of the query language is to_____.

(A) Support data integrity

(B) Retrieve and manipulate data

(C) Present the data in a user-friendly format

(D) Provide data security

1.7 A feasibility study determines whether a project is worth pursuing as it _____.

(A) Saves cost

(B) Improves operations

(C) Decreases programmer time

(D) All of the above

1.8 The difference between aggregation and composition (association) is _____.

(A) Composition can exist only for one to many relationships

(B) Composition can exist only for one to one relationship

(C) Aggregation can exist only for one to one relationship

(D) Aggregation can exist only for one to many relationships

1.9 In Oracle text datatype could be _____.

(A) Char

(B) Varchar2

(C) Nvarchar2

(D) All of the above

1.10 The form in which data is displayed from two tables that have a one-to-many relationship is called _____.

(A) Relational form

(B) Crosstab form

(C) Sub form

(D) Referential form.

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 principal advantage of the database approach is to build a single database that contains all data items of interest to an organization with controlled redundancy.

2.2 The candidate key is the minimal super key.

2.3 Most organizations build several databases leading to significant and uncontrolled redundancy between databases.

2.4 Database system offers the advantage of storing data in flexible formats.

2.5 The database management system is a software used to store, manipulate and access database.

2.6 Data independence refers to the fact that databases are defined separately from the information systems and application programs that will use them.

2.7 Database technology provides superior scalability, meaning that the database and the systems that use it can be grown or expanded to meet the changing needs of an organization.

2.8 A database contains tables that are not related to each other.

2.9 The SQL keyword DISTINCT is used to indicate that an attribute must have unique values in the base table used in the query.

2.10 From a Human Factors Design perspective, it is good practice for forms to provide Feedback through visual, text, sound or a combination of media.

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

	X		Y
3.1	Normalization	A	Stores data in multiple dimensions
3.2	Exception report	B	Ensures that data in the database is always consistent
3.3	Data warehouse	C	Tries to replicate human decision-making processes
3.4	Primary key	D	Users communicate with computers using a natural spoken or written language as opposed to programming languages.
3.5	Online transaction processing (OLTP)	E	Combines data and methods for processing
3.6	Multidimensional database	F	Assists in building management models in DSSs
3.7	Object-oriented database	G	Imposes entry integrity constraint
3.8	Model management system	H	Reduces data redundancy in a database
3.9	NLP	I	Alerts managers of need for immediate attention
3.10	Expert system	J	Contains historical data
		K	Based on user defined data
		L	Storage time less require
		M	Communicate via some technology

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

A.	SQL	B.	Select	C.	Indexing
D.	Data integrity	E.	Query	F.	Foreign
G.	Join	H.	Exporting	I.	Normalization
J.	import	K.	INSERT	L.	INT
M.	Super key				

4.1 Besides using data entry forms or keying data directly into the database, users can _____data electronically from other application files.

4.2 Data type _____ is used to restrict field values in a numbers only.

4.3 Technique used to improve data retrieval is called _____.

4.4 The predominant query language for modern-day databases is _____.

4.5 The _____ clause of SQL is used to display a subset of data from a table based on the criteria specified.

4.6 The _____ clause of SQL is used to modify existing records in the table of a database.

4.7 Procedure used to design database to reduce data redundancy is called _____.

4.8 Referential integrity constraint is imposed between tables by defining _____ key.

4.9 The process of outputting the contents of a database in a file format recognizable by other applications is called _____.

4.10 _____refers to the correctness and completeness of the data in a database.

PART TWO

(Answer any FOUR questions)

5. (a) Draw E-R diagram for the given problem :A student can enrol in one course but one course may have many students. Each course is managed by one department only. For each student, Roll No. and name is maintained For each course, course number, course name is used to be maintained Attributes need to maintain for each department is its ID and name. Specify all constraint explicitly.

(b) Explain the basic steps involved in query processing.

(c) Differentiate between-

(i) RDBMS and object-oriented DBMS.

(ii) Logical and physical data dependencies.

(6+5+4)

6. (a) Given the following functional dependency set F of table R(A, B, C, D)

$F = \{A \rightarrow BC, C \rightarrow D\}$

Find the normal form in which the given table is. Decompose this table till each table follows 3NF.

(b) Explain the principle of the various RAID levels.

(c) What is tuple calculus ? What is safe expression ? Give example.

(6+5+4)

7. (a) Consider the following table :

Employee (empid, ename, managerid, deptid, salary, DOB). Write the SQL statement for the following.

(i) Find the second highest salary from the employee table.

(ii) Get employee names starting with a vowels.

(iii) Get employee name born in year 1998.

(b) Discuss the following:

(i) Locks based protocol.

(ii) Timestamp based protocol.

(7+8)

8. (a) What are data models ? Explain their different types.

(b) Explain distributed database also explain advantage and disadvantage of distributed database.

(c) What are the various operators of relational algebra? Explain with suitable example.

(4+5+6)

9. (a) Compute key of table R=(A, B, C, D, E) using following set F of functional dependencies $F=\{AB \rightarrow C, BC \rightarrow AD, D \rightarrow E\}$.

(b) What is hashing ? What is it used for ?

(c) Why Armstrong's inference rules are called sound and complete ?

(5+5+5)

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SPACE FOR ROUGH WORK

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