3. INTRODUCTION TO DATABASE MANAGEMENT SYSTEM

2 Marks

1.Define Data Model and list the types of data model used.

A data model that determines the **logical structure** of a **database** and **fundamentally determines** in which manner data can be **stored, organized, manipulated.**

- Hierarchical Database model
- Network Model
- Relational Model
- Object Oriented database model

2. List few disadvantages of file processing system

- **Data Duplication** - Same data is used for processing system.
- **High Maintenance** - Access control and verifying data.
- **Security** - Less security provided to the data.

3. Define Single and multi valued attributes.

Single Valued Attributes	Multi Valued Attributes
A single valued attribute contains **only one value** for the attribute.	A multi valued attribute has **more than one value** for that particular attribute.
Example: Age – 13 Roll No – 1234	**Example:** Degree – M.Sc., B.Ed., Bank – SBI, IOB

4. List any two DDL and DML commands with its Syntax.

DDL Commands	Syntax	DML Commands	Syntax
CREATE	CREATE database databasename;	**INSERT**	INSERT INTO tablename VALUES(value1,value2,value3);
DROP	DROP database databasename;	**DELETE**	DELETE from tablename WHERE columnname= "value";

5. What are the ACID properties?

- **A**tomicity, **C**onsistency, **I**solation and **D**urability

6. Which command is used to make permanent changes done by a transaction?

- The TCL command **"COMMIT"** helps the database to save data permanently.

7. What is view in SQL?

- **Views** – A set of stored queries.
- A View in SQL is a logical subset of data from **one or more tables**.
- View is used to **restrict data access**.

8. Write the difference between SQL and MySQL

SQL	MySQL
SQL - **S**tructured **Q**uery **L**anguage is not a database.	My SQL is a database management system.
Used to access the database	Allows managing relational databases

9. What is Relationship and List its types.

In **E**ntity **R**elationship Model, relationship **exists** between **two entities.**

- One to One relationship
- One to Many relationship
- Many to Many relationship

10. State few advantages of Relational databases.

The features of **RDBMS** are

- High Availability
- High Performance
- Robust Transactions and support
- Ease of management
- Less cost

3 Marks

1.Explain on Evolution of DBMS.

- Storing the data started before **40 years** in various formats.
- **punched card technology** was used to store the data.
- The file system were **indexed, random** and **sequential access**.
- The file system had **more limitations** to overcome this DBMS was introduced.

2. What is relationship in databases? List its types.

In **E**ntity **R**elationship Model, relationship exists between **two entities**. Three types of relationships are available in the **Entity Relationship**.

- One to One relationship
- One to Many relationship
- Many to Many relationship

3. Discuss on Cardinality in DBMS

- Cardinality is defined as the **number of items** included in a relationship.
- Cardinality is a number of entities in **one set mapped** with the number of entities of **another set** via the **relationship.**

Types of Cardinality

- One to One – **Ex:** Person – Drives –Vehicles
- One to Many – **Ex:** Customer – Places – Order
- Many to Many – **Ex:** Student – Register – Course

4. List any 5 privileges available in MySQL for the User.

Select_Priv	**User can select rows from database tables**.
Insert_Priv	User can **insert rows into database tables**.
Update_Priv	User can **update rows of database tables.**
Delete_Priv	User can **delete rows** of **database tables**.
Create_Priv	User can **create a new tables in database.**

5. Write few commands used by DBA to control the entire database.

The **database Administrator** (DBA) uses few commands are known as **Administrative MySQL** commands to control the **entire database**.

COMMANDS	SYNTAX
USE Database	mysql > use test;
SHOW Databases	mysql > show databases;
SHOW Tables	mysql > show tables;

5 Marks

1.Discuss on various Database Models available in DBMS.

Database Models

The database technology came into existence in terms of models with **relational** and **object-relational** behavior.

Hierarchical Database Model

- In this model each record has information in **parent/child relationship** like a **tree structure.**
- ✓ **Advantages** less redundant data, **efficient search**, **data integrity**, and **security**.

Network model

- In this model each member can have **more than one owner**. The **many to many** relationships are handled in a better way.
- ✓ Network schema - It is the **structure** of database.
- ✓ Sub schema - **Controls** on views of the database.
- ✓ Language - Basic **procedural** for accessing the database.

Relational model

- Relational model is defined with two terminologies **Instance** and **Schema**.
- A relation (table) consists of **attributes(columns)** and **tuples (rows).**
- ✓ Instance - A table consisting of **rows** and **columns.**
- ✓ Schema - The structure including **name** and **type** of each column.

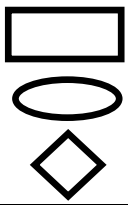
Object oriented database model

- In this model serves as the base of **Relational model**. Object oriented model uses **small**, reusable software known as **Objects**.

2. List the basic concepts of ER Model with suitable example.

ER modeling basic concepts

1. Entity or Entity type
2. Attributes
3. Relationship



1.Entity or Entity type

An Entity can be anything area-world object or animation. An entity is represented by a **rectangular box**.

Types of Entity

1. Strong Entity **2**.Weak Entity **3.** Entity Instance

Strong Entity 

A strong entity is the one which **doesn't depend on any other entity** on the database. A strong entity will have a **primary key** with it. It is represented by **one rectangle.**

Weak Entity 

A weak entity is **dependent** on other entities and it **doesn't any primary key**. It is represented by **double rectangle.**

Entity Instance

Instances are the **values** for the entity. We consider **animals as the entity** their instance will be **dog, cat, cow**…etc.

2.Attributes

An attribute is the information about the entity include **quantify, qualify, classify,** and **specify an entity.**

Types of attributes

1. Key Attribute
2. Simple Attributes
3. Composite Attributes
4. Single valued Attribute
5. Multi valued Attribute

3.Relationship Type

In ER Model, relationship exists between **two entities**. Three types of relationships are available in the **Entity Relationship.**

Relationship Type

1.One-to-One relationship – (1:1)
2.One-to-Many relationship – (1:N)
3.Many-to-Many relationship –(M:N)

3.Discuss in detail on various types of attributes in DBMS

Attributes

- An attribute is the information about that entity include **quantify, qualify, classify,** and **specify** an entity.
- An attribute will always have a single value, that value can be a **number or character or string.**

Types of attributes

1. Key Attribute
2. Simple Attributes
3. Composite Attributes
4. Single Valued Attributes
5. Multi Valued Attributes

1.Key Attribute 

- Key attributes is a **unique** characteristic on an entity.

2.Simple Attribute 

- Simple attributes is a **single value** for their entity. It **cannot be separated**.

3.Composite Attributes 

- Composite attributes is a **subdivided** into simple attributes.

Single valued attributes and Multi valued attributes.

4.Single Valued Attributes	5. Multi Valued Attributes
A single valued attribute contains **only one value** for the attribute.	A multi valued attribute has **more than one value** for that particular attribute.
Example: Age – 13 Roll No – 1234 	**Example**: Degree – M.Sc., B.Ed.,  Bank – SBI, IOB

5. Explain the DDL command of their functions in SQL.

Data Definition Language

The DDL commands are used to define database **schema (Structure).** Also to **create** and **modify** the structure of the **database object** in the database.

CREATE, ALTER, DROP, RENAME and TRUNCATE commands belongs to this category.

Commands	Description	Example
CREATE	Used to create **database or tables**	CREATE database student;
ALTER	Modifies the existing structure of **database or table**	ALTER TABLE student ADD Email varchar(25);
DROP	Deletes a **database or table**.	DROP database student;
RENAME	used to rename an **existing object in the database**	RENAME TABLE student to stud;
TRUNCATE	Used to **delete all table records**	TRUNCATE TABLE student;

4. INTRODUCTION TO HYPERTEXT PRE-PROCESSOR

2 Marks

1. What are the common usages of PHP?

- PHP is very simple and lightweight open source **server side scripting language.**
- It can easily embed with **HTML, CSS, & Java script.**
- It also creates **dynamic** and **interactive** Webpage.

2. What is Web server?

- A web server is a software that uses **Hypertext Transfer Protocol** to serve the files that form **web pages to users**.
- **Example:** Apache Tomcat, Microsoft IIS.

3. What are the types scripting language?

- Client side scripting language
- Server side scripting language

4. Difference between Client and Server?

Client	Server
The Client is a separate hardware machine which is **connected with server** in the network	The server is a high performance hardware machine it could run **more than one application** concurrently.
Client is a service **requester**	Server is a service **provider**
Example: CSS, Java script	**Example:** PHP, ASP, JSP

5. Give few examples of Web Browser?

- Google chrome
- Mozilla Firefox
- Opera
- Safari
- Internet Explorer
- UC Browser

6. What is URL?

- URL is a **U**niform **R**esource **L**ocator, the address of a specific **Web page** or **file** on the **Internet.**

  Example: https://www.google.com/

7. Is PHP a case sensitive language?

- ✓ Yes, PHP a case sensitive language.

8. How to declare variables in PHP?

- Variable name must always begin with a **$ symbol**.
- The Assignment activity implemented using **" = "** operator.
- The statement ends with semi colon **" ; "**
- **Example:** $x=3;

9. Define Client Server Architecture.

- A server is a computer that provides functionality for other programs called **clients**.
- This architecture is called the **client server model**.
- A single over all computation is distributed across **multiple processes**.

10. Define Web server?

- A web server is a software that uses **Hypertext Transfer Protocol** to serve the files that form **web pages to users**.
- **Example:** Apache Tomcat, Microsoft IIS.

3 Mark

1. Write the features of server side scripting language.

- Server side scripting language offers **greater protection** for user privacy.
- It often **reduces the loading time** for web pages.
- It is used to **create** and **run** dynamic pages.

2. Write is the purpose of Web servers?

- Web server software that **runs** on server hardware.
- The server side scripting compilation into an intermediate **byte-code**.
- That is interpreted by the **run time** engine.

3. Differentiate Server side and Client Side Scripting language?

Server Side Scripting Language	Client Side Scripting Language
Works on the server machine which could **not be visible** at the client end.	Works at the client machine and script are **visible** among the users.
Requires server interaction	**Does not need** server interaction
Example: PHP, ASP, JSP	**Example:** HTML, CSS, JavaScript

4. In how may ways you can embed PHP code in an HTML Page?

- PHP is designed to interact with **HTML and PHP** scripts.
- PHP in HTML using a PHP script tags **<?php ?>**
- PHP in HTML using Short tags **<? ?>**

5**. Write short notes on PHP operator.**

Operator is a symbol which is used to perform **mathematical and logical operations** in the programming languages.

1. Arithmetic operators
2. Assignment operators
3. Comparison operators
4. Increment/Decrement operators,
5. Logical operators
6. String operators

5 Mark

1.Discuss in detail about PHP data types.

Data Types	Description	Example
String	String is a collection of characters within the **double or single quotes**.	<?php $x= “Computer Application”; $y= ‘Computer Application’; echo $x; echo $y; ?>
Integer	Integer is a data type which contains **non decimal numbers.**	<?php $x=1234; echo $x; ?>

Float	Float is a data type which contains **decimal numbers.**	<?php $x=1.23; echo $x; ?>
Boolean	Boolean is a data type which contains the possible **two states, TRUE or FALSE.**	<?php $x=true; $y=false; echo $x; echo $y; ?>
Array	Array is a data type which has **multiple values in single variable.**	<?php $x = array("C.S", "C.A"); echo $x; ?>
Object	Object is a data type which contains information about **data and function** inside the class.	<?php $School = new School( ); ?>
NULL	Null is a special data type which contains no value.	<?php $x= "Computer Application"; $x= null; echo $x; ?> **Output** NULL
Resource	Resource is a specific variable, it has a **reference to an external resources**.	<?php $x = fopen("Book .txt", "r"); echo $x; ?>

2. Explain Operators in PHP with Example.

Operators in PHP

Operator is a symbol which is used to perform **mathematical and logical operations** in the programming languages.

1. Arithmetic operators 2.Assignment operators 3.Comparison operators
4. Increment/Decrement operators, 5. Logical operators 6.String operators

Arithmetic operators

Arithmetic operators in PHP perform addition, subtraction, multiplication, and division.

Symbol	Operator Name	Purpose
+	Addition	Adding numbers
-	Subtraction	Subtracting numbers
*	Multiplication	Multiplying numbers
/	Division	Dividing numbers
%	Modulus	Quotient remainder values

Assignment Operators

Assignment operators in PHP perform numeric values to store a value to a variable.

Assignment	Description	Assignment	Description
x = y	variable = value	x = x * y	Multiplication
x = x + y	Addition	x = x / y	Division
x = x – y	Subtraction	x = x% y	Modulus

Comparison Operators

Comparison operators perform and action to compare two values.

Symbol	Name	Symbol	Name	Symbol	Operator name
= =	Equal	< >	Not equal	<	Less than
= = =	Identical	! = =	Not Identical	>=	Greater than or equal to
! =	Not equal	>	Greater than	< =	Less than or equal to

Increment and Decrement Operators

Increment and decrement operators are used to perform increasing or decreasing variables' value.

Operator	Name
++$x	Pre-increment
$x++	Post-increment
--$x	Pre-decrement
$x--	Post-decrement

Logical Operators

Logical operators are used to perform conditional statements.

Symbol	Operator Name	Example
& &	AND	$x && $y
| |	OR	$x | | $y
!	NOT	! $x
XOR	XOR	$x xor $y

String Operators

String Operators are used to perform Concatenation and concatenation assignment.

Operator	Name	Example
.	Concatenation	$text1 . $text2
.=	Concatenation assignment	$text1 .= $text2

5. PHP FUNCTION AND ARRAY

2 Marks

1.Define Function in PHP

- A function is a block of segment in a program that performs a specific tasks.
- It is a type of **subroutine or procedure** in a program.
- A Function will be executed by a call the Function.
- Function returns any data type values or Null values to called Function.

2. Define User Defined Function

- User defined function in PHP gives a **privilege** to user to write own **specific operation** inside of existing program module.

3. What is parameterized Function.

- PHP Parameterized functions are the functions with **parameters or arguments**.
- Values can be passed from one function to another function through parameters.

4. Name any two predefined functions.

- String – strlen( ), strcmp( )
- Array – array( ), key( )
- Math – abs( ), cos( )
- MySQLi – mysqli_connect( ), mysqli_close( )
- File – fopen(), fwrite( )

5. Write Syntax of the Function in PHP.

Syntax:

```
function functionName()
{
    Code to be executed;
}
```

6. Define Array in PHP

- Array is a concept that stores **more than one value** of same data type in single array variable.
- Array is a data type which has a **multiple values** in a **single variable.**

7. What is function call?

- Once a function is defined it is executed by a function call.
- The programmer has to give a functions call inside the respective program.

Syntax:

```
functionName();
```

8. List out types of Array in PHP

- Indexed Arrays
- Associative Array
- Multi-Dimensional Array

9. Define Associative Array

- Associative arrays are a key-value pair data structure.
- Storing data in a linear array, with associative arrays you can store your data in a collection.
- Assign it a unique key which you may use for referencing your data.

Syntax:

$Array_Variable=array(key=>value, key=>value, etc..);

10. What are indexed arrays?

- An array is defined using the keyword "array".
- Each element of line array is assigned on index values. from **0** and end with **n-1**.

Syntax:

$Array_Variable = array("value1", "value2", "value3");

3 Marks

1.Write the features built-in Functions

- String - To manipulate strings.
- Array - To access and manipulate arrays.
- Math - To perform mathematical operations.
- MySQLi - To access MySQL database servers.
- File - To access and manipulate the file system.

2. Write the purpose of parameterized Function

- PHP Parameterized functions are the functions with **parameters or arguments**.
- Values can be passed from one function to another function through parameters.
- The arguments are mentioned after the function name and inside of the parenthesis.

3. Differentiate user defined and system defined Functions.

User Defined Function	System Defined Function
User defined function in PHP gives a **privilege** to user to write own **specific operation** inside of existing program module.	System defined functions called **directly** from with in a script, to perform a specific task.
Example: area(), display()	**Example:** sin(), date()

4. Write Short notes on Array

- Array is a concept that stores **more than one value** of same data type in single array variable.
- Array is a data type which has a **multiple values** in a **single variable.**
  - Indexed Arrays
  - Associative Array
  - Multi-Dimensional Array

5. Write short note on predefined or built-in functions.

- Predefined or built-in or System defined functions called directly from with in a script, to perform a specific task.
- It is a very efficient and productive.
  - String – strlen( ), strcmp( )
  - Array – array( ), key( )
  - Math – abs( ), cos( )
  - MySQLi – mysqli_connect( ), mysqli_close( )
  - File – fopen(), fwrite( )

5 Marks

1.Explain Function concepts in PHP

Functions in PHP

A function is a block of segment in a program that performs a specific tasks. It is a type of **subroutine or procedure** in a program. A Function will be executed by a call the Function. Function returns any data type values or Null values to called Function.

- User defined Function
- Pre-defined or system or built-in function
- Parameterized Function

1. User Defined Function

User defined function in PHP gives a **privilege** to user to write own **specific operation** inside of existing program module.

Syntax:

function *functionName()*

{

Code to be executed;

}

2. Function calling

Once a function is defined it is executed by a function call. The programmer has to give a functions call inside the respective program.

Syntax:

functionName();

Example

```
<?php
function insert( )
{
  echo " Student details";
}
insert();    //call the function
?>
```

3. Parameterized Function

PHP Parameterized functions are the functions with **parameters or arguments**. Values can be passed from one function to another function through parameters.

Example

```
<?php
function insert($sname)   // Parameterized function
{
        echo $sname."Student details";
} ?>
```

2. Discuss in detail about User defined Functions with a suitable example.

User defined Function

User defined function in PHP gives a **privilege** to user to write own **specific operation** inside of existing program module.

Syntax:

function *functionName()*

{

Code to be executed;

}

Function Calling

Once a function is defined it is executed by a function call. The programmer has to give a functions call inside the respective program.

Syntax:

functionName();

Example:

```
<?php
function insert( )
{
  echo " Student details";
}
insert();                    //call the function
?>
```

Output:

Student details

3. Explain the Multidimensional Array.

- A multidimensional array is an array containing one or more arrays.
- PHP understands multidimensional arrays that are two, three, four, five, or more levels deep.

Syntax:

$Array_Variable=array(array(elements),array(elements),..);

Example:

```
<?php
$student=array
(
array("Iniyan", 100,96),
array("Kavin", 60,59),
array("Nilani",50,50)
);
echo $student[0][0]. " :Tamil Mark:"
    .$student[0][1]. ": English Mark:"
    .$student[0][2]. "<br>";
echo $student[1][0]. " :Tamil Mark:"
    .$student[1][1]. ": English Mark:"
    .$student[1][2]. "<br>";
echo $student[2][0]. ":Tamil Mark:"
    .$student[2][1]. ": English Mark:"
    .$student[2][2]. "<br>";
```

Output:

Iniyan : Tamil Mark: 100 : English Mark: 96

Kavin : Tamil Mark: 60 : English Mark : 59

Nilani : Tamil Mark: 50 : English Mark : 50

4. Explain Array concepts and their types

Array

Array is a concept that stores **more than one value** of same data type in single array variable. Array is a data type which has a **multiple values** in a **single variable.**

Types of Array in PHP

- Indexed Arrays
- Associative Array
- Multi-Dimensional Array

Indexed Arrays

An array is defined using the keyword "array". Each element of line array is assigned on index values. from 0 and end with n-1.

Syntax: *$Array_Variable = array("value1", "value2", "value3");*

Associative Arrays

Associative arrays are a key-value pair data structure. Storing data in a linear array, with associative arrays you can store your data in a collection. Assign it a unique key which you may use for referencing your data.

Syntax: $Array_Variable= array(key=>value, key=>value, etc..);

Multidimensional Array

A multidimensional array is an array containing one or more arrays. PHP understands multidimensional arrays that are two, three, four, five, or more levels deep.

Syntax: *$Array_Variable=array(array(elements),array(elements),..);*

5. Explain Indexed array and Associative array in PHP.

Indexed array

- An array is defined using the keyword "array".
- Each element of line array is assigned on index values. from **0** and end with **n-1**.

Syntax:

$Array_Variable = array("value1", "value2", "value3");

Example:

```
<?php
$student_name=array("Iniyan", "Kavin", "Nilani");
echo "The student name are".$student_name[0]. ","
                              .$student_name[1]. "and"
                              .$student_name[2]. "." ;
?>
```

Output:

The student name are Iniyan, Kavin and Nilani.

Associative Array

- Associative arrays are a key-value pair data structure.
- Storing data in a linear array, with associative arrays you can store your data in a collection.
- Assign it a unique key which you may use for referencing your data.

Syntax:

$Array_Variable = array(key=>value, key=>value, etc..);

Example:

```
<?php
$Marks=array("S1" => 35, "S2"=>17);
echo "Student 1 Mark is" .$Marks['S1']. "is eligible for qualification";
echo "Student 2 Mark is" .$Marks['S2']. " is not eligible for qualification";
?>
```

Output:

Student 1 Mark is 35 is eligible for qualification

Student 2 Mark is 17 is not eligible for qualification