



तत् त्वं पूषन् अपावृणु  
केन्द्रीय विद्यालय संगठन

# KENDIRYA VIDYALAYA SANGATHAN RANCHI REGION

**STUDENT SUPPORT MATERIAL  
SESSION 2021-22**

**TERM-2**



**INFORMATICS PRACTICES(065)  
CLASS-XII**

**“Arise! Awake! and stop not until the goal is reached.” ~Swamy Vivekananda~**

# AS PER THE NEW CBSE TERM-2 SYLLABUS

## HIGHLIGHTED NOTES, QUESTIONS AND ANSWERS (SESSION 2021-22)



**Chief Patron**  
SRI D P PATEL,  
DEPUTY COMMISSIONER  
KVS REGIONAL OFFICE RANCHI



**Patron**  
SHRI D V RAMAKRISHNA,  
ASSISTANT COMMISSIONER, KVS RO RANCHI

**Subject Convenor**  
MR. DINESH KUMAR RAM,  
PGT(CS), KENDRIYA VIDYALAYA  
HINOO 1<sup>ST</sup> SHIFT, RANCHI



### CONTENT TEAM & VETTED BY SUBJECT TEACHERS

Mr. R.N.P Sinha, PGT(CS)	KV Hinoo 2 <sup>nd</sup> Shift Ranchi
Mr. Ravi Prakash, PGT(CS)	KV Namkum Ranchi

**Cover Page Design and Content Compiled by:**  
**Mr. Dinesh Kumar Ram, PGT(CS), KV Hinoo 1<sup>st</sup> Shift Ranchi**

## CONTENTS

<b>SYLLABUS- Term-2</b>	<b>03-05</b>
<b>CHAPTER 01</b> MySQL Functions and Querying using SQL	<b>06-13</b>
<b>CHAPTER 02</b> Aggregate Functions and Querying	<b>14-27</b>
<b>CHAPTER 03</b> Question Bank 'Database Query Using SQL'	<b>28-52</b>
<b>CHAPTER 04</b> Computer Networks	<b>53-64</b>
<b>CHAPTER 05</b> Introduction to Internet and Web	<b>65-76</b>
<b>CHAPTER 06</b> CBSE Sample Paper (Term-2)- 2021-22	<b>77-87</b>
<b>CHAPTER 07</b> Practice Papers	<b>88-98</b>

# Syllabus

## CBSE Term II Class XII

### Distribution of Theory Marks

Unit No.	Unit Name	Marks
2.	Database Query using SQL	25
3.	Introduction to Computer Networks	10
	<b>Total</b>	<b>35</b>

### Unit 2 Database Query usingSQL

- Math functions: POWER (), ROUND (), MOD ().
- Text functions: UCASE ()/UPPER (), LCASE ()/LOWER (), MID ()/SUBSTRING ()/SUBSTR ()  
LENGTH (), LEFT (), RIGHT (), INSTR (), LTRIM (), RTRIM (), TRIM ().
- Date Functions: NOW (), DATE (), MONTH (), MONTHNAME (), YEAR (), DAY (), DAYNAME (). Aggregate Functions: MAX (), MIN (), AVG (), SUM (), COUNT ();  
using COUNT (\*).
- Querying and manipulating data using Group by, Having, Order by.

### Unit 3 Introduction to Computer Networks

- Introduction to networks, Types of network: LAN, MAN, WAN.
- Network Devices: modem, hub, switch, repeater, router, gateway.
- Network Topologies: Star, Bus, Tree, Mesh.
- Introduction to Internet, URL, WWW and its applications- Web, email, Chat, VoIP.
- Website: Introduction, difference between a website and webpage, static dynamic web page, web server and hosting of a website.
- WebBrowsers: Introduction, commonly used browsers, browser settings, add-ons and plug-ins, cookies.

### Distribution of Practical Marks

Topic	Marks
SQL queries (pen and paper)	7
Practical File – 12 SQL Queries	2
Final Project Submission	3
Viva	3
<b>Total</b>	<b>15</b>

## Suggested Practical List Data Management

1. Create a student table with the student id, name, and marks as attributes where the student id is the primary key.
2. Insert the details of a new student in the above table.
3. Delete the details of a student in the above table.
4. Use the select command to get the details of the students with marks more than 80.
5. Find the min, max, sum, and average of the marks in a student marks table.
6. Find the total number of customers from each country in the table (customer ID, customer Name, country) using group by.
7. Write a SQL query to order the (student ID, marks) table in descending order of the marks.

## Project Work

The aim of the class project is to create tangible and useful IT applications. The learner may identify a real-world problem by exploring the environment. e.g. Students can visit shops/business places, communities or other organizations in their localities and enquire about the functioning of the organization, and how data are generated, stored, and managed.

The learner can take data stored in csv or database file and analyze using Python libraries and generate appropriate charts to visualize. If an organization is maintaining data offline, then the learner should create a database using MySQL and store the data in tables.

Data can be imported in Pandas for analysis and visualization. Learners can use Python libraries of their choice to develop software for their school or any other social good. Learners should be sensitized to avoid plagiarism and violation of copyright issues while working on projects. Teachers should take necessary measures for this. Any resources (data, image etc.) used in the project must be suitably referenced.

The project can be done individually or in groups of 2 to 3 students. The project should be started by students at least 6 months before the submission deadline.

## CHAPTER-1

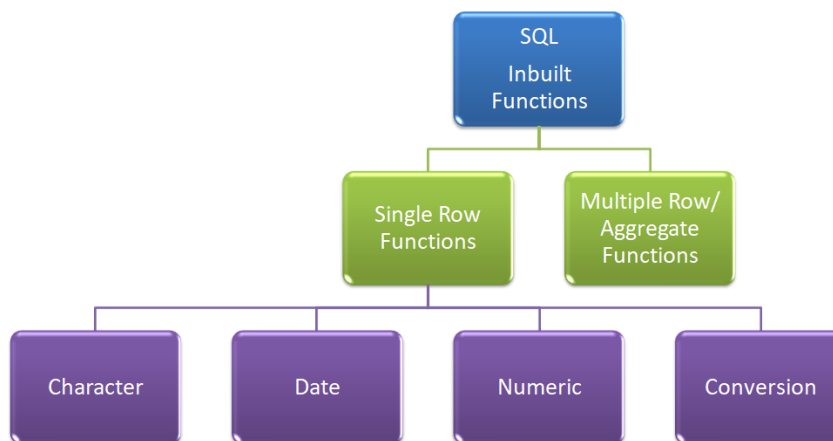
# MySQL Functions and Querying using SQL

### What is a function?

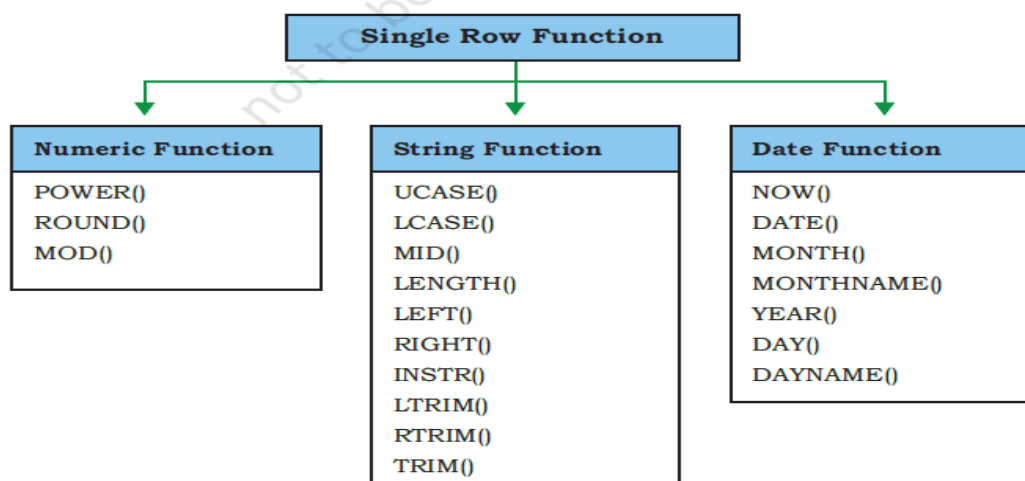
A function is a predefined formula which takes one or more arguments as input then process the arguments and returns an output.

### MySQL function

A function is a set of predefined commands that performs specific operation and returns a single value. The functions used in SQL can be categorised into two categories namely single row or scalar functions and multiple row or group or aggregate functions.



**Single Row Functions:** These are also known as Scalar functions. Single row functions are applied on a single value and return a single value.



**Mathematical Functions:** MySQL provides a number of functions used for performing mathematical calculations on database. Mathematical functions are very important in SQL

to implement different mathematical concepts in queries. Some mathematical functions are explained with examples as follows:

Function	Description	Example
MOD ( A,B)	Return the remainder of A/B	SELECT MOD(11,3) ; OUTPUT:- 2 SELECT MOD(10.5,3) ; OUTPUT:- 1.5
POWER ( A,B) or POW(A,B)	Returns the value of A raised to the power B	SELECT POWER(5,3) ; OUTPUT:- 125 SELECT POW(2,-2) ; OUTPUT:- 0.25 SELECT POWER(-2,3) ; OUTPUT:- -8 SELECT POWER(2.37,3.45) ; OUTPUT:- 19.6282....
ROUND (N,D )	Return number rounded to D place after decimal, If D is not specified,N is rounded up to 0 digit of decimal and the result is an Integer. <b>If</b> the first digit after the decimal value is 5 or >5 then integer number is increased by 1 <b>If</b> D is +ve ,then N is rounded up to D digits after the decimal by checking D+1th digit,if it is 5 or <5,then the d <sup>th</sup> digit is increased by 1 <b>If</b> D is -ve , then N is rounded up to D digits before the decimal by checking D <sup>th</sup> digit, if it is 5 or >5 then d-1th digit is increased by 1,all trailing dth digits are converted to 0 and the result is an integer value.	SELECT ROUND(1.58) ; OUTPUT:- 2  SELECT ROUND(-1.23) ; OUTPUT:- -1  SELECT ROUND(1.298,0) ; OUTPUT:- 1  SELECT ROUND(-5.898,0) ;OUTPUT:- -6  SELECT ROUND(3.79867,3) ; OUTPUT:- 3.799  SELECT ROUND(23.298,-1) ; OUTPUT:- 20  SELECT ROUND(36567.78,-4) ; OUTPUT:- 40000
SIGN ( )	Return the sign of the given number	SELECT SIGN(-10) ; OUTPUT:- -1 SELECT SIGN(10) ; OUTPUT:- 1
SQRT ( )	Return the non-negative square root of the given number	SELECT SQRT(25) ; OUTPUT:- 5
TRUNCATE( x, d)	Truncates x to the specified number of d. <b>If</b> d is 0,it removes all the decimal values and returns integer. <b>If</b> d is +ve, Truncates x to d digits right to the decimal point. <b>If</b> d is -ve, Truncates x to d digits left fo the decimal point.	SELECT TRUNCATE(7.29, 0) ; OUTPUT:- 7  SELECT TRUNCATE(27.59, 1) ; OUTPUT:- 27.5  SELECT TRUNCATE(389.23, -2) ; OUTPUT:- 300
ABS (value )	Returns the absolute value of the given value.	SELECT ABS(-25) ; OUTPUT:- 25 SELECT ABS(-234.67) ; OUTPUT:- 234.67

**String/Text Functions:** The string/text functions of SQL are used to extract, change, format or alter character strings. They accept a character string as an input and provides character string or numeric values as an output. Some string/text functions are explained with example as follows :

Function	Description	Example
ASCII ( )	Returns the ASCII code of the character.	SELECT ASCII ('A') FROM DUAL; OUTPUT:- 65 SELECT ASCII ('1') FROM DUAL; OUTPUT:- 49 SELECT ASCII ('ABC') FROM DUAL; OUTPUT:- 65
TRIM ( )	Remove spaces from beginning and ending	SELECT TRIM(' APPLE '); OUTPUT:'APPLE'
LTRIM ( )	Returns string after removing left side of spaces.	SELECT LTRIM(' APPLE '); OUTPUT:'APPLE'
RTRIM ( )	Returns string after removing right side of spaces.	SELECT LTRIM(' APPLE '); OUTPUT:' APPLE'
INSTR ( )	It search one string in another string and returns position, if not found 0	SELECT INSTR ('COMPUTER','PUT') ; OUTPUT: - 4 SELECT INSTR ('COMPUTER','PY') ; OUTPUT: - 0
LENGTH ( )	Returns number of Characters in the string.	SELECT LENGTH ('COMPUTER') ; OUTPUT: - 8
LEFT (S,N)	Returns N characters of String S from beginning	SELECT LEFT('COMPUTER',3) ; OUTPUT:- COM
RIGHT(S,N)	Returns N characters of String S from ending	SELECT RIGHT('COMPUTER',3) ; OUTPUT:- TER
SUBSTR ( )	Returns the substring as specified	SELECT SUBSTR('COMPUTER',3,4) ; OUTPUT:- MPUT
CONCATE ( )	Returns concatenated String	SELECT CONCAT('COM','PUTER') ; OUTPUT:- COMPUTER
LOWER() / LCASE()	Converts string into lowercase.	SELECT LOWER('COMPUTER') ; OUTPUT:- computer
UPPER() / UCASE()	Converts string into uppercase.	SELECT UPPER('COMPUTER') ; OUTPUT:- COMPUTER
REPLACE()	Replace all occurrences of the second string in the first string with the third string.	SELECT REPLACE ('INFO COMPUTER','INFO','LATEST') ; OUTPUT:- LATEST COMPUTER
REVERSE()	Return reverse of the given string.	SELECT REVERSE('COMPUTER') ; OUTPUT:- RETUPMOC
REPEAT ( )	Returns a given string for a specified number of times.	SELECT REPEAT('COM',3) ; OUTPUT:- COMCOMCOM



**Date/Time Functions:** MySQL stores date in date/time format, representing the century, month, year, day and hours. The date and time functions are used to perform operations on the date/time data stored in the database. The default date format is YYYY-MM-DD in MySQL. Some date/time functions are explained with examples as follows:

Function	Description	Example
CURDATE ( )	Returns the current Date	SELECT CURDATE( ) ; OUTPUT:- 14/06/2021
DATE ( )	Returns the Date part only	SELECT DATE( '01/07/2020' ) ; OUTPUT:- 01
MONTH ( )	Returns the Month part only	SELECT MONTH ( '01/07/2020' ) OUTPUT: - 07
YEAR ( )	Returns the Year part only	SELECT YEAR ( '01/07/2020' ) OUTPUT: - 2020
DAYNAME ( )	Returns the name of the week day	SELECT DAYNAME ( '01/07/2020' ) OUTPUT: - <b>WEDNESDAY</b>
MONTHNAME ( )	Returns the name of the month.	SELECT MONTHNAME ( '01/07/2020' ) OUTPUT: - JULY
DAYOFMONTH ( )	Returns the day of the month(1-31)	SELECT DAYOFMONTH ( '01/07/2020' ) OUTPUT: - 01
DAYOFWEEK ( )	Returns the weekday index of the date.	SELECT DAYOFWEEK ( '01/07/2020' ) OUTPUT: - 04
DAYOFYEAR ( )	Returns the day of the year(1-366).	SELECT DAYOFYEAR ( '01/07/2020' ) OUTPUT: - 183
NOW ( )	Returns both current date & time at which the function execute.	SELECT NOW ( );
SYSDATE ( )	Returns the current date & time.	SELECT NOW ( ) , SLEEP(2), NOW( ); OUTPUT: 01/07/2020 04:20:32 01/07/2020 04:20:32 SELECT SYSDATE( ) , SLEEP ( 2 ), SYSDATE( ); OUTPUT: 01/07/2020 04:20:32 01/07/2020 04:20:34

**Difference Between NOW() and SYSDATE() :** NOW() function return the date and time at which function was executed even if we execute multiple NOW() function with select. whereas SYSDATE() will always return date and time at which each SYSDATE() function started execution.

**For example:**

```
mysql> Select now(), sleep(2), now();
```

**Output:** 2018-12-04 10:26:20, 0, 2018-12-04 10:26:20

```
mysql> Select sysdate(), sleep(2), sysdate();
```

**Output:** 2018-12-04 10:27:08, 0, 2018-12-04 10:27:10

## Chapter Practice:

### A. Question based on String Function:

Answer the question 1 to 12 by Considering the following table

StudentID	StudentName	Marks
1	Sanjay	64
2	Varun	72
3	Akash	45
4	Rohit	86
5	Anjali	92

Q1. Write a query to count the number of students from the Students table.

Ans: `SELECT COUNT(StudentID) FROM Students;`

Q.2 Write a query to count the number of students scoring marks > 75 from the Students table.

Ans: `SELECT COUNT(StudentID) FROM Students WHERE Marks >75;`

Q3. This function is used to return the average value of a numeric column.

Ans: `SELECT AVG(ColumnName) FROM TableName;`

Q4. Write a query to calculate the average marks of all students from the Students table.

Ans: `SELECT AVG(Marks) FROM Students;`

Q5. Write a query to retrieve the minimum marks out of all students from the Students table.

Ans: `SELECT MIN(Marks) FROM Students;`

Q6. Write a query to retrieve the maximum marks out of all students from the Students table.

Ans: `SELECT MAX(Marks) FROM Students;`

Q7. Write a query to retrieve the marks of the first student.

Ans: `SELECT FIRST(Marks) FROM Students;`

Q8. Write a query to retrieve the marks of the last student.

Ans: `SELECT LAST(Marks) FROM Students;`

Q9. Write a query to retrieve the names of all students in lowercase.

Ans: `SELECT LCASE(StudentName) FROM Students;`

Output:

sanjay

varun

akash

rohit

anjali

Q10. Write a query to retrieve the names of all students in lowercase.

Ans: `SELECT UCASE(StudentName) FROM Students;`

Output:

SANJAY

VARUN

AKASH

ROHIT

ANJALI

Q11. Write a query to extract the length of the student name "Sanjay".

Ans: `SELECT LENGTH("Sanjay") AS StudentNameLen;`

Output: 6

Q12. Write a query to extract substrings from the StudentName column.

Ans: `SELECT MID(StudentName, 2, 3) FROM Students;`

Output:

anj  
aru  
kas  
ohi  
nja

**B. Question based on String Function:**

Answer the question 1 to 12 by Considering the following table

Marks		
StudentID	StudentName	Marks
1	Sanjay	90.76
2	Varun	80.45
3	Akash	54.32
4	Rohit	72.89
5	Anjali	67.66

Q1. Write a query to round the marks to the integer value.

Ans: `SELECT ROUND(Marks) FROM Students;`

Output:

91  
80  
54  
73  
68

Q2. Write a query to retrieve the current date and time.

Ans: `SELECT NOW();`

Output: `NOW()`

2019-10-14 09:16:36

Q3. Write a query to display the numbers "123456789" in the format "###-###-###"

Ans: `SELECT FORMAT(123456789, "###-###-###");`

Output: 123-456-789

### **Short Answer Type Questions:**

**Q1.** Which type of MySQL function accepts only numeric values? Give the name of some functions of that type.

**Ans.** Mathematical functions accept only numeric values and return the value of same type. These functions are used to perform mathematical operations on the database data. Some mathematical functions are `OW()/POWER()`, `ROUND()`, etc.

**Q2.** Which SQL function is used to remove leading and trailing spaces from a character expression X, where X = 'LEARNING ###MYSQL####' (# denotes a blank space) and also give the output of X.

**Ans.** TRIM function is used to remove all leading and trailing spaces from the given character expression.

**Syntax** TRIM({BOTH|LEADING|TRAILING} [remstr] FROM] str/column\_name)

e.g. mysql> SELECT TRIM(' LEARNING###MYSQL####');

**Output** LEARNING###MYSQL

Spaces between 'LEARNING' and 'MYSQL' cannot be removed.

**Q 3.** Write the output of following MySQL queries:

- (i) SELECT ROUND(6.5675,2);
- (ii) SELECT TRUNCATE(5.3456,2);
- (iii) SELECT DAYOFMONTH(curdate());
- (iv) SELECT MID('PRE\_BOARDCLASS 12',4,6);

**Ans.** (i)

```
ROUND (6.5675,2)
6.57
```

(ii)

```
TRUNCATE(5.3456,2)
5.34
```

(iii) If curdate is 05/12/2017, then output is 5.

(iv)

```
MID('PRE_BOARDCLASS 12',4,6)
_BOARD
```

**Q4.** Predict the output of the following queries:

- (i) mysql>SELECT POWER(3,2);
- (ii) mysql>SELECT DATE('2009-01-21 02:01:04');

**Ans:**

(i)

```
POWER (3,2)
9
```

(ii)

```
DATE('2009-01-21 02:01:04')
2009-01-21
```

**Q5.** Write the name of the functions to perform the following operations:

- (i) To display the day like "Monday", "Tuesday", from the date when India got independence.
- (ii) To display the specified number of characters from a particular position of the given string.
- (iii) To display the name of the month in which you were born.
- (iv) To display your name in capital letters.

**Ans.** (i) DAYNAME( )

(ii) MID( ) or SUBSTR( ) or SUBSTRING( )

(iii) MONTHNAME( )

(iv) UPPER( ) or UCASE( )

Q6. Write any four differences between single-row functions and multiple-row functions.

Ans:

Single_row Functions	Multiple_row functions
1. It operates on a single row at a time.	1. It operates on groups of rows.
2. It returns one result per row.	2. It returns one result for a group of rows.
3. It can be used in Select, Where, and Order by clause.	3. It can be used in the select clause only.
4. Math, String and Date functions are examples of single row functions.	4. Max(), Min(), Avg(), Sum(), Count() and Count(*) are examples of multiple row functions.

Q7. What are the differences between the string function and numeric function?

Ans. Differences between string and numeric functions are given below:

String Function	Numeric Function
Accepts text input	Accepts only numeric values
Returns both numeric and string values.	Returns only numeric values. String functions include
String functions include ASCII(), CHAR(), LEFT(), etc.	Numeric functions include POW(), ROUND(), TRUNCATE(), etc.

Q8. Mention the type of the functions given below with their purpose.

- (i) TRUNCATE()
- (ii) DAYOFMONTH()
- (iii) LEFT()

Ans. (i) **TRUNCATE()** It is a mathematical function and returns a number truncated up to specified number of digits.

(ii) **DAYOFMONTH()** It is a Date/Time function and returns the day of month for the specified date.

(iii) **LEFT()** It is a string function and returns the leftmost number of characters as specified.

Q9. Give the output of following commands :

- (i) mysql>SELECT LEFT ('Swati',4);
- (ii) mysql>SELECT RTRIM ('!!!! Study is important!!!!'); where, !!!! denotes blank spaces.
- (iii) mysql>SELECT ROUND(3234.343,1);

Ans:

- (i)
 

```
LEFT ('Swati', 4)
Swat
```
- (ii)

```
RTRIM('!!!! Study is important !!!!')
!!!! Study is important
```
- (iii)

```
ROUND (3234.343,1)
3234.3
```

**Q10.** Write the output of the following SQL queries:

- (i) SELECT SUBSTR(TRIM(' INDIA Is Great ',3,6) ;
- (ii) SELECT ROUND(654.67152) + ROUND(152.4146,2) ;
- (iii) SELECT INSTR('MOBILE PHONE','E') ;
- (iv) SELECT DAYOFMONTH('2019-11-22');

Ans:

- (i) 

```
SUBSTR (TRIM (' INDIA Is Great ',3,6)
DIA Is
```
- (ii) 

```
ROUND(654.67152)+ ROUND(152.4146,2)
807.41
```
- (iii) 

```
INSTR ('MOBILE PHONE', 'E')
6
```
- (iv) 

```
DAYOFMONTH ('2019-11-22')
22
```

## CHAPTER-2

# Aggregate Functions

Aggregate functions are also called multiple row functions. These functions work on a set of records as a whole, and return a single value for each column of the records on which the function is applied.

Aggregate Functions is used to perform calculation on group of rows and return the calculated summary like sum of salary , average of salary.

1. AVG()
2. COUNT()
3. MAX()
4. MIN()
5. SUM()

**1. AVG() Function:** The AVG() function returns the average value of a numeric column.

Syntax: `SELECT AVG(column_name) FROM table_name`

SQL AVG() Example: We have the following "Orders" table:

O_Id	OrderDate	OrderPrice	Customer
1	2018/11/12	1000	Vivek Kumar
2	2021/10/23	1600	Nitesh Sharma
3	2020/09/02	700	Vivek Kumar
4	2019/09/03	300	Vivek Kumar
5	2020/08/30	2000	Samarjeet Gupta
6	2020/10/04	100	Nitesh Sharma

Now we want to find the average value of the "OrderPrice" fields.

We use the following SQL statement:

```
SELECT AVG(OrderPrice) AS OrderAverage FROM Orders
```

The result-set will look like this:

OrderAverage
950

Now we want to find the customers that have an OrderPrice value higher than the average OrderPrice value.

We use the following SQL statement:

```
SELECT Customer FROM Orders  
WHERE OrderPrice > (SELECT AVG(OrderPrice) FROM Orders)
```

The result-set will look like this:

Customer
Vivek Kumar
Nitesh Sharma
Samarjeet Gupta

## 2. COUNT( ) Function:

The COUNT() function returns the number of rows that matches a specified criteria.

The COUNT(column\_name) function returns the number of values (NULL values will not be counted) of the specified column:

```
SELECT COUNT(column_name) FROM table_name
```

The COUNT(\*) function returns the number of records in a table:

```
SELECT COUNT(*) FROM table_name
```

The COUNT(DISTINCT column\_name) function returns the number of distinct values of the specified column:

```
SELECT COUNT(DISTINCT column_name) FROM table_name
```

COUNT(column\_name) Example

We have the following "Orders" table:

O_Id	OrderDate	OrderPrice	Customer
1	2018/11/12	1000	Vivek Kumar
2	2021/10/23	1600	Nitesh Sharma
3	2020/09/02	700	Vivek Kumar
4	2019/09/03	300	Vivek Kumar
5	2020/08/30	2000	Samarjeet Gupta
6	2020/10/04	100	Nitesh Sharma

Now we want to count the number of orders from "Customer Nitesh Sharma".

We use the following SQL statement:

```
SELECT COUNT(Customer) AS CustomerNitesh Sharma FROM Orders
WHERE Customer='Nitesh Sharma'
```

The result of the SQL statement above will be 2, because the customer Nitesh Sharma has made 2 orders in total:



<b>Customer Nitesh Sharma</b>
2

Example: If we omit the WHERE clause, like this:

```
SELECT COUNT(*) AS NumberOfOrders FROM Orders
```

The result-set will look like this:

<b>NumberOfOrders</b>
6

which is the total number of rows in the table.

COUNT(DISTINCT column\_name) Example:

Now we want to count the number of unique customers in the "Orders" table.

We use the following SQL statement:

```
SELECT COUNT(DISTINCT Customer) AS NumberOfCustomers FROM Orders
```

The result-set will look like this:

<b>NumberOfCustomers</b>
3

which is the number of unique customers (Vivek Kumar, Nitesh Sharma, and Samarjeet Gupta) in the "Orders" table.

### **3. The MAX() Function**

The MAX() function returns the largest value of the selected column.

Syntax: SELECT MAX(column\_name) FROM table\_name

Example: We have the following "Orders" table:

O_Id	OrderDate	OrderPrice	Customer
1	2018/11/12	1000	Vivek Kumar
2	2021/10/23	1600	Nitesh Sharma
3	2020/09/02	700	Vivek Kumar
4	2019/09/03	300	Vivek Kumar
5	2020/08/30	2000	Samarjeet Gupta
6	2020/10/04	100	Nitesh Sharma

Now we want to find the largest value of the "OrderPrice" column.

We use the following SQL statement:

```
SELECT MAX(OrderPrice) AS LargestOrderPrice FROM Orders
```

The result-set will look like this:

LargestOrderPrice
2000

#### 4. The MIN() Function

The MIN() function returns the smallest value of the selected column.

Syntax: SELECT MIN(column\_name) FROM table\_name

Example: We have the following "Orders" table:

O_Id	OrderDate	OrderPrice	Customer
1	2018/11/12	1000	Vivek Kumar
2	2021/10/23	1600	Nitesh Sharma
3	2020/09/02	700	Vivek Kumar
4	2019/09/03	300	Vivek Kumar
5	2020/08/30	2000	Samarjeet Gupta
6	2020/10/04	100	Nitesh Sharma

Now we want to find the smallest value of the "OrderPrice" column.

We use the following SQL statement:

```
SELECT MIN(OrderPrice) AS SmallestOrderPrice FROM Orders
```

The result-set will look like this:

SmallestOrderPrice
100

#### 5. The SUM() Function

The SUM() function returns the total sum of a numeric column.

Syntax: SELECT SUM(column\_name) FROM table\_name

Example: We have the following "Orders" table:

O_Id	OrderDate	OrderPrice	Customer
1	2018/11/12	1000	Vivek Kumar
2	2021/10/23	1600	Nitesh Sharma
3	2020/09/02	700	Vivek Kumar
4	2019/09/03	300	Vivek Kumar
5	2020/08/30	2000	Samarjeet Gupta
6	2020/10/04	100	Nitesh Sharma

Now we want to find the sum of all "OrderPrice" fields".

We use the following SQL statement:

```
SELECT SUM(OrderPrice) AS OrderTotal FROM Orders
```

The result-set will look like this:

OrderTotal
5700

## The GROUP BY Statement

The GROUP BY statement is used in conjunction with the aggregate functions to group the result-set by one or more columns.

Syntax:

```
SELECT column_name, aggregate_function(column_name)
FROM table_name
WHERE column_name operator value
GROUP BY column_name
```

Example: We have the following "Orders" table:

O_Id	OrderDate	OrderPrice	Customer
1	2018/11/12	1000	Vivek Kumar
2	2021/10/23	1600	Nitesh Sharma
3	2020/09/02	700	Vivek Kumar
4	2019/09/03	300	Vivek Kumar
5	2020/08/30	2000	Samarjeet Gupta
6	2020/10/04	100	Nitesh Sharma

Now we want to find the total sum (total order) of each customer.

We will have to use the GROUP BY statement to group the customers.

We use the following SQL statement:

```
SELECT Customer,SUM(OrderPrice) FROM Orders
GROUP BY Customer
```

The result-set will look like this:

Customer	SUM(OrderPrice)
Vivek Kumar	2000
Nitesh Sharma	1700
Samarjeet Gupta	2000

Let's see what happens if we omit the GROUP BY statement:

```
SELECT Customer,SUM(OrderPrice) FROM Orders
```

The result-set will look like this:

Customer	SUM(OrderPrice)
Vivek Kumar	5700
Nitesh Sharma	5700
Vivek Kumar	5700
Vivek Kumar	5700
Samarjeet Gupta	5700
Nitesh Sharma	5700

The result-set above is not what we wanted.

**Explanation of why the above SELECT statement cannot be used:** The SELECT statement above has two columns specified (Customer and SUM(OrderPrice)). The "SUM(OrderPrice)" returns a single value (that is the total sum of the "OrderPrice" column), while "Customer" returns 6 values (one value for each row in the "Orders" table). This will therefore not give us the correct result. However, you have seen that the GROUP BY statement solves this problem.

### GROUP BY More Than One Column

We can also use the GROUP BY statement on more than one column, like this:

```
SELECT Customer, OrderDate, SUM(OrderPrice) FROM Orders
GROUP BY Customer, OrderDate
```

### The HAVING Clause

The HAVING clause was added to MySQL because the WHERE keyword could not be used with aggregate functions.

Syntax:

```
SELECT column_name, aggregate_function(column_name)
FROM table_name
WHERE column_name operator value
GROUP BY column_name
HAVING aggregate_function(column_name) operator value
```

Example: We have the following "Orders" table:

O_Id	OrderDate	OrderPrice	Customer
1	2018/11/12	1000	Vivek Kumar
2	2021/10/23	1600	Nitesh Sharma
3	2020/09/02	700	Vivek Kumar
4	2019/09/03	300	Vivek Kumar
5	2020/08/30	2000	Samarjeet Gupta
6	2020/10/04	100	Nitesh Sharma

Now we want to find if any of the customers have a total order of less than 2000.

We use the following SQL statement:

```
SELECT Customer,SUM(OrderPrice) FROM Orders
GROUP BY Customer
HAVING SUM(OrderPrice)<2000
```

The result-set will look like this:

Customer	SUM(OrderPrice)
Nitesh Sharma	1700

Now we want to find if the customers "Vivek Kumar" or "Samarjeet Gupta" have a total order of more than 1500.

We add an ordinary WHERE clause to the SQL statement:

```
SELECT Customer, SUM(OrderPrice) FROM Orders
WHERE Customer='Vivek Kumar' OR Customer='Samarjeet Gupta'
GROUP BY Customer
HAVING SUM(OrderPrice)>1500
```

The result-set will look like this:

Customer	SUM(OrderPrice)
Vivek Kumar	2000
Samarjeet Gupta	2000

## *Chapter Practice:*

### *Multiple Choice Questions*

1. Which of the following is not an aggregate function?

- (a) AVG()                      (b) ADD()  
(c) MAX()                      (d) COUNT()

**Ans.** (b) There is no aggregate function named ADD() but SUM() is an aggregate function which performs mathematical sum of multiple rows having numerical values.

2. Which aggregate function returns the count of all rows in a specified table?

- (a) SUM()                      (b) DISTINCT()  
(c) COUNT()                      (d) None of these

**Ans.** (c) COUNT() function returns the total number of values or rows of the specified field or column.

3. In which function, NULL values are excluded from the result returned?

- (a) SUM()                      (b) MAX()  
(c) MIN()                      (d) All of these

**Ans.** (d) NULL values are excluded from the result returned by all the aggregate functions.

4. The AVG() function in MySQL is an example of

- (a) Math function                      (b) Text function

- (c) Date function                      (d) Aggregate function

**Ans. (d)** The AVG() function returns the average value from a column or multiple-rows.  
So, the AVG () function in MySQL is an example of aggregate function.

**5.** Which of the following function count all the values except NULL?

- (a) COUNT(\*)                      (b) COUNT(column\_name)  
(c) COUNT(NOT NULL)      (d) COUNT(NULL)

**Ans. (a)** All aggregate functions exclude NULL values while performing the operation and COUNT(\*) is an aggregate function.

**6.** What is the meaning of "GROUP BY" clause in MySQL?

- (a) Group data by column values  
(b) Group data by row values  
(c) Group data by column and row values  
(d) None of the mentioned

**Ans. (a)** Through GROUP BY clause we can create groups from a column of data in a table.

**7.** Which clause is similar to "HAVING" clause in MySQL?

- (a) SELECT                      (b) WHERE  
(c) FROM                      (d) None of the mentioned

**Ans. (b)** HAVING clause will act exactly same as WHERE clause.  
i.e. filtering the rows based on certain conditions.

**8.** Which clause is used with an "aggregate functions"?

- (b) GROUP BY                      (b) SELECT  
(c) WHERE                      (d) Both (a) and (c)

**Ans. (a)** "GROUP BY" is used with an aggregate functions.

**9.** What is the significance of the statement "GROUP BY d.name" in the following MySQL statement? SELECT name, COUNT (emp\_id), emp\_no FROM department

GROUP BY name;

- (c) Counting of the field "name" on the table "department"  
(d) Aggregation of the field "name" of table "department"  
(e) Sorting of the field "name"  
(f) None of the mentioned

**Ans. (b)** "GROUP BY" clause is used for aggregation of field. Above statement will find the aggregation of the field "name" of table "department".

**10.** What is the significance of the statement "HAVING COUNT (emp\_id)>2" in the following MySQL statement?

SELECT name, COUNT (emp\_id), emp\_no FROM department

GROUP BY name HAVING COUNT (emp\_id)>2;

- (g) Filter out all rows whose total emp\_id below 2  
(h) Selecting those rows whose total emp\_id>2  
(i) Both (a) and (b)  
(j) None of the mentioned

**Ans. (c)** "HAVING" clause are worked similar as "WHERE" clause i.e. filtering the rows based on certain conditions. GROUP BY command places conditions in the query using

HAVING clause. So, all the groups having employee count greater than 2 will be displayed.

**11.** What is the significance of "ORDER BY" in the following MySQL statement?

```
SELECT emp_id, fname, lname FROM person
```

```
ORDER BY emp_id;
```

- (a) Data of emp\_id will be sorted
- (b) Data of emp\_id will be sorted in descending order
- (c) Data of emp\_id will be sorted in ascending order
- (d) All of the mentioned

**Ans.** (c) Sorting in ascending or descending order depends on keyword "DESC" and "ASC". The default order is ascending.

**12.** What will be the order of sorting in the following MySQL statement?

```
SELECT emp_id, emp_name FROM person
```

```
ORDER BY emp_id, emp_name;
```

- (a) Sorting {emp\_id, emp\_name}
- (b) Sorting {emp\_name, emp\_id}
- (c) Sorting {emp\_id} but not emp\_name
- (d) None of the mentioned

**Ans.** (a) In the query, first "emp\_id" will be sorted then emp\_name with respect to emp\_id.

**13.** Which of the following is not a valid SQL statement?

- (a) SELECT MIN(pub\_date) FROM books GROUP BY category HAVING pub\_id = 4;
- (b) SELECT MIN(pub\_date) FROM books WHERE category = 'COOKING';
- (c) SELECT COUNT(\*) FROM orders WHERE customer# = 1005;
- (d) SELECT MAX(COUNT(customer#)) FROM orders GROUP BY customer#;

**Ans.** (a) HAVING clause is wrongly applied on attribute "pub\_id" rather than attribute "category".

**14.** If emp\_id contain the following set {9, 7, 6, 4, 3, 1, 2}, what will be the output on execution of the following MySQL statement?

```
SELECT emp_id
```

```
FROM person ORDER BY emp_id;
```

- (a) {1, 2, 3, 4, 6, 7, 9}
- (b) {2, 1, 4, 3, 7, 9, 6}
- (c) {9, 7, 6, 4, 3, 1, 2}
- (d) None of the mentioned

**Ans.** (a) "ORDER BY" clause sort the emp\_id in the result set in ascending order and in absence of keyword ASC or DESC in the ORDER BY clause the default order is ascending.

**15.** Find odd one out?

- (a) GROUP BY
- (b) DESC
- (c) ASC
- (d) ORDER BY

**Ans.** (a) "ORDER BY", "DESC", "ASC" are related to sorting whereas "GROUP BY" is not related to sorting.

### Case Based MCQs

**Direction** Read the case and answer the following questions.

16. A School in Delhi uses database management system to store student details. The school maintains a database 'school\_record' under which there are two tables.

**Student Table** Maintains general details about every student enrolled in school.

**StuLibrary Table** To store details of issued books. BookID is the unique identification number issued to each book. Minimum issue duration of a book is one day. [CBSE Question Bank 2021]

Student	
Field	Type
StuID	numeric
StuName	varchar(20)
StuAddress	varchar(50)
StuFatherName	varchar(20)
StuContact	numeric
StuAadhar	numeric
	varchar(5)
StuSection	varchar(1)

StuLibrary	
Field	Type
BookID	numbric
StuID	numbric
Issued_date	Date
Return_date	Date

- (i) Identify the SQL query which displays the data of StuLibrary table in ascending order of student ID.

- I. SELECT \* FROM StuLibrary ORDER BY BookID;
- II. SELECT \* FROM StuLibrary ORDER BY StuID;
- III. SELECT \* FROM StuLibrary ORDER BY StuID ASC;
- IV. SELECT \* FROM StuLibrary ORDER BY StuID DESC;

Choose the correct option, which displays the desired data.

- (a) Both I and IV                      (b) Both I and II  
(c) Both III and IV                    (d) Both II and III

**Ans.** (d) Since the default order of sorting is ASC or ascending, therefore if it is not mentioned in the query the query will take the default order.

- (ii) The primary key for StuLibrary table is/are .....

- (a) BookID                              (b) BookID, StuID  
(c) BookID, Issued\_date              (d) Issued\_date

**Ans.** (a) Because BookID will have unique and NOT NULL values.

- (iii) Which of the following SQL query will display dates on which number of issued books is greater than 5?

- (a) SELECT Issued\_date FROM StuLibrary GROUP BY Issued\_date WHERE COUNT(\*)>5;
- (b) SELECT Issued\_date FROM StuLibrary GROUP BY Return\_date HAVING COUNT(\*)>5;
- (c) SELECT Issued\_date FROM StuLibrary GROUP BY Issued\_date HAVING COUNT(\*)>5;
- (d) SELECT Issued\_date FROM StuLibrary GROUP BY Return\_date WHERE COUNT(\*)>5;

**Ans.** (c) SELECT Issued\_date FROM StuLibrary GROUP BY Issued\_date HAVING COUNT(\*)>5;

17. Table: Book\_Information                      Table: Sales



Column Name
Book_ID
Book_Title
Price

Column Name
Store_ID
Sales_Date
Sales_Amount

(i) Which SQL statement allows you to find the highest price from the table Book\_Information?

- (a) SELECT Book\_ID, Book\_Title, MAX(Price) FROM Book\_Information;
- (b) SELECT MAX(Price) FROM Book\_Information;
- (c) SELECT MAXIMUM(Price) FROM Book\_Information;
- (d) SELECT Price FROM Book\_Information ORDER BY Price DESC;

**Ans.** (b) SELECT MAX(Price) FROM Book\_Information;

(ii) Which SQL statement allows you to find sales amount for each store?

- (a) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales;
- (b) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales ORDER BY Store\_ID;
- (c) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales GROUP BY Store\_ID;
- (d) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales HAVING UNIQUE Store\_ID;

**Ans.** (c) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales GROUP BY Store\_ID;

(iii) Which SQL statement lets you to list all store name whose total sales amount is over 5000 ?

- (a) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales GROUP BY Store\_ID HAVING SUM(Sales\_Amount) > 5000;
- (b) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales GROUP BY Store\_ID HAVING Sales\_Amount > 5000;
- (c) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales WHERE SUM(Sales\_Amount) > 5000 GROUP BY Store\_ID;
- (d) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales WHERE Sales\_Amount > 5000 GROUP BY Store\_ID;

**Ans.** (a) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales GROUP BY Store\_ID HAVING SUM(Sales\_Amount) > 5000;

(iv) Which SQL statement lets you find the total number of stores in the SALES table?

- (a) SELECT COUNT(Store\_ID) FROM Sales;
- (b) SELECT COUNT(DISTINCT Store\_ID) FROM Sales;
- (c) SELECT DISTINCT Store\_ID FROM Sales;
- (d) SELECT COUNT(Store\_ID) FROM Sales GROUP BY Store\_ID;

**Ans.** (d) SELECT COUNT(Store\_ID) FROM Sales GROUP BY Store\_ID;

(v) Which SQL statement allows you to find the total sales amount for Store\_ID 25 and the total sales amount for Store\_ID 45?

- (e) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales WHERE Store\_ID IN ( 25, 45) GROUP BY Store\_ID;
- (f) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales GROUP BY Store\_ID HAVING Store\_ID IN ( 25, 45);
- (g) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales WHERE Store\_ID IN (25,45);
- (h) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales WHERE Store\_ID = 25 AND Store\_ID =45 GROUP BY Store\_ID;

**Ans.** (b) SELECT Store\_ID, SUM(Sales\_Amount) FROM Sales GROUP BY Store\_ID HAVING Store\_ID IN ( 25, 45);

## Subjective Questions

### Short Answer Type Questions

1. What are the aggregate functions in SQL?

**Ans.** Aggregate function is a function where the values of multiple-rows are grouped together as input on certain criteria to form a single value of more significant meaning. Some aggregate functions used in SQL are  
SUM ( ), AVG( ), MIN(), etc.

2. What is the purpose of GROUP BY clause in MySQL? How is it different from ORDER BY clause?

**Ans.** The GROUP BY clause can be used to combine all those records that have identical value in a particular field or a group of fields. Whereas, ORDER BY clause is used to display the records either in ascending or descending order based on a particular field. For ascending order ASC is used and for descending order, DESC is used. The default order is ascending order.

3. Shanya Khanna is using a table EMPLOYEE. It has the following columns:

Admno, Name, Agg, Stream [column Agg contains Aggregate marks]

She wants to display highest Agg obtained in each Stream.

She wrote the following statement:

```
SELECT Stream, MAX(Agg) FROM EMPLOYEE;
```

But she did not get the desired result. Rewrite the above query with necessary changes to help her get the desired output.

**Ans.** SELECT Stream, MAX(Agg)

```
FROM EMPLOYEE
```

```
GROUP BY Stream;
```

4. What are the differences between HAVING clause and Group By clause?

**Ans**

S.No.	Having Clause	Group By Clause
1.	It is used for applying some extra condition to the query.	The group by clause is used to group the data according to particular column or row.
2.	Having can be used without group by clause, in aggregate function, in that case it behaves like where clause.	group by can be used without having clause with the select statement.
3.	The having clause can contain aggregate functions.	It cannot contain aggregate functions.
4.	It restricts the query output by using some conditions	It groups the output on basis of some rows or columns.

5. What is the difference between WHERE clause and HAVING clause?

Ans: A HAVING clause is like a WHERE clause, but applies only to groups as a whole (that is, to the rows in the result set representing groups), whereas the WHERE clause **applies to individual rows**. A query can contain both a WHERE clause and a HAVING clause.

6. Gopi Krishna is using a table Employee. It has the following columns :

Code, Name, Salary, Dept\_code

He wants to display maximum salary department wise. He wrote the following command :

```
SELECT Deptcode, Max(Salary) FROM Employee;
```

But he did not get the desired result.

Rewrite the above query with necessary changes to help him get the desired output.

**Ans.** SELECT Deptcode, Max(Salary) FROM Employee

```
GROUP BY Deptcode;
```

7. Write a query that counts the number of doctors registering patients for each day. (If a doctor has more than one patient on a given day, he or she should be counted only once.)

P_ID	ProductName	Manufacture	Price
TP01	TALCOM POWDER	LAK	40
FW05	FACE WASH	ABC	45
BS01	BATH SOAP	ABC	55
SH06	SHAMPOO	XYZ	120
FW12	FACE WASH	XYZ	95

**Ans.** SELECT ord\_date, COUNT (DISTINCT doctor\_code) FROM Patients

```
GROUP BY ord_date;
```

8. Consider the table DOCTOR given below. Write commands in SQL for (i) to (ii) and output for (iii) to (v).

**Table : DOCTOR**

ID	DOCName	Department	DOJ	Gender	Salary
1	Amit Kumar	Orthopaedics	1993-02-12	M	35000
2	Anita Hans	Paediatrics	1998-10-16	F	30000
3	Sunita Maini	Gynaecology	1991-08-23	F	40000
4	Joe Thomas	Surgery	1994-10-20	M	55000
5	Gurpreet	Paediatrics	1999-11-24	F	52000
6	Anandini	Oncology	1994-03-16	F	31000

(i) Display the names and salaries of doctors in descending order of salaries.

(ii) Display names of each department along with total salary being given to doctors of that department.

- (iii) SELECT SUM(Salary) FROM DOCTOR WHERE Department='Surgery';
- (iv) SELECT Department, COUNT(\*) FROM DOCTOR GROUP BY Department;
- (v) SELECT DOCName FROM DOCTOR WHERE Department LIKE '%gery%';

Ans. (i) SELECT DOCName, Salary FROM DOCTOR ORDER BY Salary DESC;

(ii) SELECT Department, SUM(Salary) FROM DOCTOR GROUP BY Department;

(iii)

SUM(Salary)
102000

(iv)

Department	COUNT(*)
Orthopaedics	1
Paediatrics	2
Gynaecology	1
Surgery	2
Oncology	2

(v)

DOCName
Joe Thomas
Siddharth Dang

## CHAPTER-3

# Question Bank Database Query using SQL

### [1 marks question]

1) The avg( ) function in MySQL is an example of .....

- (i) Math Function
- (ii) Text Function
- (iii) Date Function
- (iv) Aggregate Function
- (v) Aggregate Function

Ans:-

2) The ..... Command can be used to make changes in the rows of table in SQL.

Ans:- UPDATE

3) The SQL Command that will display the current time and date.

Ans :- Select now();

4) The mid()function in MySql is an example of \_\_\_\_\_.

- a. Math function
- b. Text function
- c. Date Function
- d. Aggregate Function

Ans:- b. Text Function

5) The \_\_\_\_\_ function is used in SQL to find one string into another.

Ans:- Instr( )

6) MID ( ) and SUBSTR ( ) function in SQL serves the same purpose. (Yes/No)

Ans:- Yes

7) Write the output for the following SQL command:

Select round(15.193 , -1);

Ans:- 10

8) Write a SQL query to display date after 10 days of current date on your system.

Ans:- Select curdate()+10;

1 mark for correct SQL command

9) Write the output for the following sql command:

Select SUBSTR('ABCDEFGF', -5 ,3)

Ans:- UBS

10) Which keyword is used to arrange the result of order by clause in descending order?

- a. DSEC
- b. DES
- c. DESCE
- d. DESNO

Ans:- a. DESC

11) The clause that is used to arrange the result of SQL command into groups

- a. Order by
- b. Group in
- c. Groups by
- d. Group by

Ans :- d.Group By

12) Find the Output of SQL command :

`select concat (concat ('Inform', 'atics'),'Practices');`

- a. Informatics Practices
- b. Informatic Practices
- c. Inform practices
- d. Inform atics practices

Ans :- a. InformaticsPractices

13) Write the output of the following SQL command.

`select round (19.88,1);`

- a. 19.88
- b. 19.8
- c. 19.9
- d. 20.0

Ans:- c. 19.9

14) The now() function in MySql is an example of .

- a. Math function
- b. Text function
- c. Date Function
- d. Aggregate Function

Ans:- c. Date Function

15) The.....command can be used to makes changes in the structure of a table in SQL.

Ans:- ALTER

16) Write the SQL command that will display the time and date at which the command got executed.

Ans :- `Select sysdate();`

17) Write the output of the following SQL command.

`select round(15.872,1);`

- a. 15.87
- b.15.9
- c.15.8
- d.16

Ans:- b. 15.9

18)

Manish wants to select all the records from a table named "Students" where the value of the column "FirstName" ends with an "a". Which of the following SQL statement will do this?

- a. `SELECT * FROM Students WHERE FirstName = 'a';`
- b. `SELECT * FROM Students WHERE FirstName LIKE 'a%';`
- c. `SELECT * FROM Students WHERE FirstName LIKE '%a';`
- d. `SELECT * FROM Students WHERE FirstName = '%a%';`

Ans:-

d. SELECT \* FROM Students WHERE FirstName = '%a%';

19) The \_\_\_ command can be used to add a new column to the table.

Ans:- ALTER

20) Which SQL command is used to describe the structure of the table ?

Ans:- DESC

21) Foreign Key in a table is used to enforce

- i) Data dependency
- ii) Referential Integrity
- iii) Views
- iv) Index Locations

Ans:- ii) Referential Integrity

22) A table 'Student' contains 5 rows and 4 columns initially. 2 more rows are added and 1 more column is added . What will be the degree and cardinality of the table student after adding these rows and columns?

- i) 7, 5
- ii) 5,7
- iii) 5,5
- iv) None of the above

Ans:- ii) 5,7

23) Insert into student values(1,'ABC','10 Hari Nagar') is a type of which command :

- i) DML
- ii) DDL
- iii) TCL
- iv) DCL

Ans:- i) DML

24) What will be the output of - select mid('Pyhton Programming',3,9);

- i) ton Progr
- ii) ton Progr
- iii) hton Prog
- iv) htonProg

Ans:- iii) hton Prog

25) Write the output of the following SQL statement:

SELECT TRUNCATE(15.79,-1) , TRUNCATE(15.79,0), TRUNCATE(15.79,1);

- a. 15      15      15.7
- b. 10      15.7    15.9
- c. 10      15      15.7
- d. 10      10      15.9

Ans:- c. 10      15      15.7

26) The COUNT( ) in MySQL is an example of :

- a. Math function
- b. Text function
- c. Date Function
- d. Aggregate Function

Ans:- d. Aggregate Funcion

27) ..... which of the following sublanguages of SQL is used to query information from the database and to insert tuples into, delete tuples from and modify tuples in the database?

- a. DML
- b. DDL
- c. Query
- d. Relational Schema

Ans:-

- a. DML

28) The ..... clause of SELECT query allows us to select only those rows in the result that satisfied a specified condition.

- a. WHERE
- b. FROM
- c. HAVING
- d. LIKE

Ans:-

- a. WHERE

29) Write the output of the following SQL command.

```
select substr("COMPUTER",3,4);
```

- a. MPUT
- b. PUTE
- c. PU
- d. MP

Ans: -

- a. MPUT

30) The now() function in MySql is an example of \_\_\_\_\_.

- a. Math function
- b. Text function
- c. Date Function
- d. Aggregate Function

Ans :-

- c. Date Function

31) The \_\_\_\_\_ command is used to make the changes in a table permanent.

Ans:- COMMIT

32) Give SQL command that will display the current month from the date and time.

Ans :- MONTH( )

33) Which of the following keywords will you use in the following query to display all the records of students whose name start with S?

```
SELECT * from student where name _____ "S%"
```

Ans :-

- LIKE

34) Which of the following is an aggregate function:

- a. Upper()
- b. Trim()
- c. Date()
- d. Sum()

Ans:-

- d. SUM()



35) Write the output of the following SQL command:

```
SELECT left("Jammu Region", 5);
```

- a. Region
- b. Jammu
- c. Jammu Region
- d. None of the above.

Ans:-

b. Jammu

36)

What will be the output of the following code?

```
SELECT MOD(14,3);
```

Ans:

2

37)

What will be the result of the following query based on the table given here.

```
SELECT COUNT(Salary) FROM Instructor;
```

Instructor_id	Name	Department	Salary
236	Steive	Comp.Sci.	50000
635	Charles	Biology	70000
189	Natalya	Elec.Eng.	60000
372	Sheryl	Physics	null
439	Davis	Biology	80000
583	Calvin	Comp.Sci.	null
648	Jenny	Finance	95000

Ans:-

COUNT(Salary)

-----

5

38) Write the command to delete all the data of the table 'activity' retaining only structure.

Ans:- DELETE FROM ACTIVITY;

39) Write the output for the following SQL commands

```
Select round(15.193 , -1);
```

Ans:-

10

40) Write a SQL query to display date after 20 days of current date on your system.

Ans:- SELECT CURDATE( ) + 10;

41) Write the output for the following sql command

```
Select SUBSTR('ABCDEFGF', -5 ,3)
```

Ans:-

CDE

42) Which keyword is used to arrange the result of order by clause in descending order?

- a. DSEC
- b. DES
- c. DESC
- d. DESNO

Ans:

C. DESC

43) Write the output of the following SQL command.

Select round(14.872,1)

- a)14.87
- b)14.9
- c)14.8
- d) 15

Ans:- b) 14.9

44) The \_\_\_\_\_ command can be used to change the size of column to the table.

Ans:- ALTER

45) The \_\_\_\_\_ command can be used to makes changes in the rows of a table in SQL.

Ans:- Update

46) Write the output of the following SQL command.

select round (49.88);

- a. 49.88
- b. 49.8
- c. 49.0
- d. 50

Ans:- d. 50

47) Write the output of the following SQL command.

select round (19.88,1);

- a. 19.88
- b. 19.8
- c. 19.9
- d. 20.0

Ans:- c. 19.9

48) Select count(\*) from Employee;

The above query will not consider the following:

- a) Numeric value
- b) Text value
- c) Null value
- d) Date value

Ans:- c) NULL Value

49) Which of the following is/are not correct aggregate functions in SQL:

- a. AVG()
- b) COUNT()
- c) TOTAL()
- d) MAX()

Ans:- c) Total( )

50) The \_\_\_\_\_ command can be used to make changes in the definition of a table in SQL.

Ans:- ALTER

51) Write the SQL clause used to sort the records of a table.

Ans:- ORDER BY

52) Write the output of the following SQL command.

select round(15.857,-1);

- a. 15.8
- b. 15.9
- c. 15.0
- d. 20

Ans:- 20

53) The now()function in MySql is an example of \_\_\_\_\_.

- a. Math function
- b. Text function
- C. Date Function
- d. Aggregate Function

Ans:- c. Date Function

54) The \_\_\_ command can be used to makes changes in the structure of a table in SQL.

Ans:- ALTER

55) Write the SQL command that will display the time and date at which the command got executed.

Ans: SELECT NOW();

56) In SQL NULL value means :  
(i) 0 value (ii) 1 value (iii) None value (iv) None of the above

Ans:- iii) None value

57) Find the output of SQL Query:-  
SELECT MOD(11, 3);

Ans:- 2

58) The MAX() function in MySql is an example of

\_\_\_\_\_.

- a. Math function
- b. Text function
- c. Date Function
- d. Aggregate Function

Ans:- d. Aggregate Function

59) Write the output of the following SQL command.

select round(314.82,-1);

- a. 314.0
- b. 310.0
- c. 314.8
- d. 300.0

Ans:- d. 300

60) What will be the output of the following SQL command:

SELECT LTRIM(" RAJKUMAR ");

Ans:- "RAJKUMAR "

(Removes spaces from left side)

61) Write the output of the following SQL command.

select pow(2.37,3.45);

- a. 17.62
- b. 19.62
- c. 18.35
- d. 15.82

Ans:- b. 19.62

62) Having clause is used with \_\_\_\_\_ function.

- a. Math function
- b. Text function
- c. Date Function
- d. Aggregate Function

Ans:- Aggregate Function

63) Write the output of the query:

```
select instr('Toolbarbar','bar');
```

Ans:- 5

- 64) alter() function in MySql is part of \_\_\_\_\_
- DDL command
  - DML Command
  - TCL command

Ans a. DDL Command  
1 mark for the correct answer

- 65) The \_\_\_\_\_ command can be used to arrange data in some order in a table in SQL.

Ans:- ORDER BY

- 66) Write the name of the clause used with SELECT command to search for a specific pattern in the strings.

Ans:- LIKE

### [2 marks question]

- 1) State any two differences between single row functions and multiple row functions.  
OR

**What is the difference between the order by and group by clause when used along with the select statement. Explain with an example.**

Ans:- Differences between single row functions and multiple row functions. (i) Single row functions work on one row only whereas multiple row functions group rows (ii) Single row functions return one output per row whereas multiple row functions return only one output for a specified group of rows.

OR The order by clause is used to show the contents of a table/relation in a sorted manner with respect to the column mentioned after the order by clause. The contents of the column can be arranged in ascending or descending order.

The group by clause is used to group rows in a given column and then apply an aggregate function eg max(), min() etc on the entire group. (any other relevant answer)

Single row v/s Multiple row functions 1 mark for each valid point

Group by v/s Order by 1 mark for correct explanation 1 mark for appropriate example

- 2) Consider the decimal number x with value 8459.2654. Write commands in SQL to: i. round it off to a whole number ii. round it to 2 places before the decimal.

Ans:- i. select round(8459.2654);  
ii. select round(8459.2654,-2);

1 mark each for correct answer of part (i) , (ii)

- 3) **Anjali writes the following commands with respect to a table employee having fields, empno, name, department, commission.**

**Command1 : Select count(\*) from employee;**

**Command2: Select count(commission) from employee;**

**She gets the output as 4 for the first command but gets an output 3 for the second command. Explain the output with justification.**

Ans:- This is because the column commission contains a NULL value and the aggregate functions do not take into account NULL values. Thus Command1 returns the total number of records in the table whereas Command2 returns the total number of non NULL values in the column commission.

- 4) **Consider the following SQL string: "Preoccupied"**

**Write commands to display:**

**a. "occupied" b. "cup"**

**OR**

**Considering the same string "Preoccupied" Write SQL commands to display:**

**a. the position of the substring 'cup' in the string "Preoccupied" b. the first 4 letters of the string**

Ans:- a. select substr("Preoccupied", 4);  
or  
select substring("Preoccupied", 4);  
or  
select mid("Preoccupied",4);  
or  
select right(("Preoccupied", 8);

b. select substr("Preoccupied" ,6,3);  
or  
select substring("Preoccupied", 6,3);  
or  
select mid(("Preoccupied" ,6,3);

**OR**

a. select instr 'Preoccupied' , ' 'cup');  
b. select left 'Preoccupied',4);

1 mark for each correct answer of part (a) , (b)

- 5) **What is the difference between the where and Having clause when used along with the select statement. Explain with an example.**

**OR**

**Explain the difference between Update and Alter command with help of an example.**

Ans Where clause is used to apply condition on individual rows and not supports aggregate function While Having clause is used to apply condition on groups and it supports aggregate functions.

Eg: `SELECT * FROM EMP WHERE SALARY > 50000;`

Eg: `SELECT * FROM EMP GROUP BY DEPTNO HAVING COUNT(*) > 2;`

OR

UPDATE command is a part of DML command and used to update the data of rows of a table. While ALTER command is a part of DDL command and used to change the structure of a table like adding column, removing it or modifying the datatype of columns.

Eg: `UPDATE EMP SET SALARY = 20000;`

`ALTER EMP ADD EMP_DOJ DATE;`

**6) Write the output of following queries:-**

i. `SELECT SUBSTR('Aakila', -3);`

ii. `SELECT LEFT('Toolbar', 4);`

Ans:-

i. 'ila'

ii. 'Tool'

**7) Raghav writes the following commands with respect to a table Flight having Fields FLCODE, START, DESTINATION, NO\_STOPS.**

**Command1 : `Select count(*) from FLIGHT;`**

**Command2: `Select count(DESTINATION) from FLIGHT;`**

**He gets the output as 5 for the first command but gets an output 3 for the second command. Explain the output with justification.**

Ans:- This is because the column DESTINATION contains a NULL value and the aggregate functions do not take into account NULL values. Thus Command1 returns the total number of records in the table whereas Command2 returns the total number of non NULL values in the column DESTINATION.

**8) Write the output for following queries:**

i. `select MOD(11,4) "Modulus", power(3,2) "Raised";`

ii. `select CURDATE( )+10;`

OR

i. `select length('CORONA COVID-19');`

ii. `select lcase('COMputer Science');`

Ans:-

i. Modulus

Raised

-----

-----

3

9

ii. currentdate + 10 days aftward date will come

or

i. 15

ii. 'computer science'

9) **Consider the decimal number x with value 7459.3654. Write commands in SQL to:**

**i) round it off to a whole number**

**ii) round it to 2 places before the decimal.**

Ans:- (i) select round(7459.3654, 0)  
(ii) select round(7459.3654, -2)

10) **Shailly writes the following commands with respect to a table Employee having fields, empno, name, department, commission.**

**Command1 : *SELECT COUNT(\*) FROM EMPLOYEE;***

**Command2 : *SELECT COUNT(COMMISSION) FROM EMPLOYEE;***

**She gets the output as 7 for the first command but gets an output 5 for the second command. Explain the output with justification.**

Ans:- This is because the column commission contains a NULL value and the aggregate functions do not take into account NULL values. Thus Command1 returns the total number of records in the table whereas Command2 returns the total number of non NULL values in the column commission.

11) **Consider the following SQL string: "SELFMOTIVATION". Write commands to display:**

**a. "MOTIVATION"**

**b. "MOT"**

**OR**

**Considering the same string "SELFMOTIVATION". Write SQL commands to display:**

**a. the position of the substring 'MOTIV' in the string "SELFMOTIVATION"**

**b. the last 6 letters of the string**

Ans:- a. select substr("SELFMOTIVATION", 5)  
b. select substr("SELFMOTIVATION", 5, 3)

**OR**

a. select instr("SELFMOTIVATION", "MOTIV")

b. select right("SELFMOTIVATION", 6)

(student may use other functions like - substring/ mid/ right .. etc)

12) State any two differences between Update and alter commands.

OR

What is datatype? What are the main objectives of datatypes?

Ans:- Data types are meant to identify the type of data and its associated functions.  
The main objectives of datatypes is to clarify the type of data a variable can store and which operations can be performed on it.

13) Consider the decimal number n with value 278.6975. Write commands in SQL :

- i. That gives output 279
- ii. That gives output 280

Ans:- i) select round(278.6975);  
(ii) select round(278.6975,-1);  
or some other queries that produces same results.  
1 mark each for correct answer of part (i) , (ii)

14) (i) Consider a table "Employee" that have fields - empno, name, department, salary.  
Based on the above table "Employee", Manvendra has entered the following SQL command:

```
SELECT * FROM Employee where Salary = NULL;
```

But the Query is not executing successfully. What do you suggest to him in order to execute this query i.e. write the correct query.

(ii) Write a SQL query to display the details of those employees whose Salary column has some values.

Ans:- (i) select \* from Employee where Salary is NULL;  
(ii) select \* from Employee where Salary is not NULL;

1 mark each for correct answer of part (i) , (ii)

15) Consider the following SQL string: "Master Planner".

Write commands to display:

- a. "Master"
- b. "Plan"

OR

Considering the same string "Master Planner".

Write SQL commands to display:

- a. the position of the substring 'Plan' in the string "Master Planner"
- b. the Last 4 letters of the string

Ans:- a. select substr("Master Planner",1,6);  
b. select substr("Master Planner",8,4); or some other queries that produces same results.

1 mark each for correct answer of part (i) , (ii)

OR

a. select instr("Master Planner","Plan");  
b. select right("Master Planner",4); or some other queries that produces same results.

1 mark each for correct answer of part (i) , (ii)

16) What are multiple row functions? Give examples



**OR**

**What is Group by clause? How can we specify condition with Group by clause? Explain with an example.**

Ans:-

- 17) Consider the decimal number N with value 87654.9876. Write commands in SQL to:**
- round it off to a whole number**
  - round it to 2 places before the decimal.**

Ans:-

- 18) State any two differences between single row functions and multiple row functions.**

**OR**

**What is the difference between the order by and group by clause when used along with the select statement. Explain with an example.**

Ans:-

**19. Differences between single row functions and multiple row functions.**

- Single row functions work on one row only whereas multiple row functions group rows
- Single row functions return one output per row whereas multiple row functions return only one output for a specified group of rows.

**OR**

The order by clause is used to show the contents of a table/relation in a sorted manner with respect to the column mentioned after the order by clause. The contents of the column can be arranged in ascending or descending order.

The group by clause is used to group rows in a given column and then apply an aggregate function eg max(), min() etc on the entire group. (any other relevant answer)

Single row v/s Multiple row functions 1 mark for each valid point

Group by v/s Order by 1 mark for correct explanation 1 mark for appropriate example

- 19) Give the output of :**

- Select round(123.93);**
- Select round(123.93,1);**

Ans:-

- 124
- 123.9

- 20) Consider the following SQL string: "Mental Toughness Helps You Succeed" Write commands to display following using functions:**

- "Toughness"**
- "Succeed"**

**OR**

**Considering the same string: "Mental Toughness Helps You Succeed"**

**Write SQL commands to display:**

**a. the position of the substring "Helps" in the string "Mental Toughness Helps You Succeed" the first 6 letters of the string**

Ans:-

- Select mid('Mental Toughness Helps You Succeed', 8, 9)
- Select right('Mental Toughness Helps You Succeed', 7);

**OR**

i) select instr("Mental Toughness Helps You Succeed",'Helps');

ii) select left("Mental Toughness Helps You Succeed",6);

1 Mark each for correct function usage

- 21) Find out the error in the following SQL command and correct the same.**  
**Select \* from employee group by dept where sum(salary) > 2000000**

Ans:- Select \* from employee group by dept where sum(salary) > 2000000 in this query in place of WHERE clause HAVING clause to be used.

22) **Helps Abhay to Compare Having clause and Order by clause?**

Or

**Shewani has recently started working in MySQL. Help her in understanding the difference between where and having clause.**

Ans:- Having clause is used in conjunction with group by clause in MySQL. It is used to provide condition based on grouped data. On the other hand, order by clause is an independent clause used to arrange records of a table in either ascending or descending order on the basis of one or more columns

OR

COUNT(\*) returns the number of items in a group, including NULL values and duplicates. COUNT(expression) evaluates expression for each row in a group and returns the number of non null values

2 marks of correct explanation & for any other relevant answer.

23) **Write commands in SQL to:**

i. **round off value 56789.8790 to nearest thousand's place.**

ii. **Display day from date 13-Apr-2020.**

Ans:- i. Select ROUND(56789.8790,-3);

ii. Select DAY('2020-04-13') 1 mark each for correct answer.

24) **Given Table Course:**

CID	CNAME	FEES	STARTDATE	TID
C201	AGDCA	12000	2018-07-02	101
C202	ADCA	15000	2018-07-15	103
C203	DCA	10000	2018-10-01	102
C204	DDTP	9000	2018-09-15	104
C205	DHN	20000	2018-08-01	101
C206	O LEVEL	18000	2018-07-25	105

**Find out the output for given SQL command:**

**SELECT TID, COUNT(\*), MIN(FEES) FROM COURSE GROUP BY TID HAVING COUNT(\*)>1;**

Ans:- Ans:

TID COUNT(\*) MIN(FEES)

101 2  
12000

2 marks for correct output

25) **Consider the following SQL strings: S1= "INDIA" S2="MY" & S3="DI" Write commands to display:**

a. "MYINDIA"

b. "india"

OR

**Considering the same string as above Write SQL commands to**

**display:**

**a. The position of the string S3 in the string S1.**

**The first 4 letters of the concatenation of string S1 and S2.**

Ans:-

a. Select CONCAT(s2,S1);

b. Select LCASE(S1)

OR

a. Select INSTR(S1,S3);

b. Select LEFT(CONCAT(S1,S2));

1 mark each for correct SQL command.

**26) What is importance of primary key in a table? How many primary keys can be there for a table?**

OR

**Explain working of TRIM( ) function with proper examples.**

Ans:- Primary Key : A column of collection of columns to identify a tuple in a relation. It is used to search / locate row in a relation. There can be only one primary key in a table. 1 mark for correct definition with proper significance.

1 mark for stating only one primary key in a table.

OR

TRIM ( ) function is used to remove leading and trailing spaces from a string a table. It can be used as

TRIM(String)

For example;

```
SELECT TRIM(' bar ');
```

```
-> 'bar'
```

1 mark for stating purpose of the functions 1 mark for correct example.

**27)**

**Consider the following 'Student' table.**

TABLE:Student

Rollno	Sname	Subject	Marks	grade
001	SUMIT	MATHS	95	A
002	SHERRY	IP	96	A
003	SUMAN	IP	75	
004	LALIT	HINDI	84	B
005	RAHUL	MATHS	88	B

**(i) What will be the most suitable datatype for the grade column and why?**

**(ii) Write a command to insert Suman's record with the data as shown in the table.**

Ans:-

(i) Gender column datatype char(1) as all the possible values can be accommodated and it will be space efficient.

(ii) INSERT INTO Student (Rollno, Sname, Subject, Marks) VALUES ("003", "SUMAN", "IP", 75);

1 mark for each correct answer

28) Explain the working of ORDER BY clause of SELECT query with proper example.

Ans:- The ORDER BY keyword is used to sort the result-set in ascending or descending order.

The ORDER BY keyword sorts the records in ascending order by default. To sort the records in descending order, use the DESC keyword.

1 mark for correct explanation. 1 mark for appropriate example

29)

Consider a string "AS YOU know MORE"  
Write the queries for the following tasks.

2

(i) Write a command to display "know".

(ii) Write a command to display number of characters in the string.

OR

Consider a string "You Grow more" stored in a column str. What will be the output of the following queries?

(i) SELECT UPPER(str);

(ii) SELECT substr(str,-9,4);

Ans:- (i) select mid("AS YOU know MORE",8,4);

(ii) select length("AS YOU know MORE");

OR

(i) YOU GROW MORE

(ii) Grow

1 mark for each correct answer

**[3 marks question]**

1) A relation Vehicles is given below :

V_no	Type	Company	Price	Qty
AW125	Wagon	Maruti	250000	25
J0083	Jeep	Mahindra	4000000	15
S9090	SUV	Mitsubishi	2500000	18
M0892	Mini van	Datsun	1500000	26
W9760	SUV	Maruti	2500000	18
R2409	Mini van	Mahindra	350000	15

Write SQL commands to:

- a. Display the average price of each type of vehicle having quantity more than 20.
- b. Count the type of vehicles manufactured by each company.
- c. Display the total price of all the types of vehicles.

Ans:- a. select Type, avg(Price) from Vehicle group by Type having Qty>20;  
 b. select Company, count(distinct Type) from Vehicle group by Company;  
 c. Select Type, sum(Price\* Qty) from Vehicle group by Type;

- a. ½ mark for the Select with avg(), ½ mark for the having clause
- b. ½ mark for the Select with count() , ½ mark for group by clause
- c. ½ mark for the Select with sum() , ½ mark for the group by clause

2) Consider the table Garment and write the query:

**Table: GARMENT**

G CODE	G NAME	SIZE	COLOUR	PRICE
111	T Shirt	XL	Red	1400.00
112	Jeans	L	Blue	1600.00
113	Skirt	M	Black	1100.00
114	Ladies Jacket	XL	Blue	4000.00
115	Trousers	L	Brown	1500.00
116	Ladies Toop	L	Pink	1200.00

- i. Display the Minimum price of the Garment.
- ii. Count and display the number of GARMENT from each SIZE where number of GARMENTS are more than 1
- iii. Display the sum of price of each color garment

Ans:- i. SELECT MIN(PRICE) FROM GARMENT;  
 ii. SELECT SIZE,COUNT(\*) FROM GARMENT  
 GROUP BY SIZE  
 HAVING COUNT(\*)>1;  
 iii. SELECT COLOUR,SUM(PRICE) FROM GARMENT GROUP BY COLOUR;

3) A relation SALESMAN is given below:

SNO	SNAME	SALARY	BONUS	DATEOFJOIN	AREA
A01	Kushagra Jain	30000	45.25	29-10-2019	Delhi
A02	Prakhar Sharma	50000	25.50	13-03-2018	Ajmer
B03	Trapti Singh	30000	35.00	18-03-2017	Jhansi
B04	Shailly	80000	45.00	31-12-2018	Delhi
C05	Lakshay Lawania	20000	10.25	23-01-1989	Jaipur
C06	Naresh	70000	12.75	15-06-1987	Ajmer
D07	Krishna Singh	50000	27.50	18-03-1999	Jhansi

Write SQL commands to perform the following operations:

- i) Count the number of salesman area-wise.
- ii) Display the month name for the date of join of salesman of area 'Ajmer'
- iii) Display the total salary paid to all salesman.

- Ans:- (i) select area, count(sname) as "Number of salesman" from Salesman group by area;  
(ii) select monthname(dateofjoin) from Salesman where area='Ajmer';  
(iii) select sum(salary) from Salesman;

4) Consider the given table Faculty :-

Faculty_Id	First_name	Last_name	Hire_date	Salary
1102	Sulekha	Mishra	12-10-1997	25000
1203	Naveen	Vyas	23-12-1994	18000
1404	Rakshit	Soni	25-08-2003	32000
1605	Rashmi	Malhotra	18-09-2004	21000
1906	Amit	Srivastava	05-06-2007	28000

Write SQL commands to :

- To display details of those faculty members whose First\_name ends with 't'.
- Display all records in descending order of Hire\_date.
- Find the maximum and minimum salary.

- Ans:- a. Select \* from Faculty where First\_name like '%t';  
b. Select \* from Faculty order by Hire\_date desc;  
c. Select max(Salary), min(Salary) from Faculty;  
1 mark for each correct answer

5) Given the table CARDEN having following data:

CCode	CarName	Company	Color	Capacity	Charges
501	A-Star	Suzuki	Red	3	14
503	Indigo	Tata	Silver	3	12
502	Innova	Toyota	White	7	15
509	Qualis	Toyota	Silver	4	14
510	Wagon R	Suzuki	Red	4	35

Write SQL Commands for the following :

- Display the average charges of each type of car company having capacity more than 3.
- Count the totalcars manufactured by each company.
- Display the total charges of all the types of vehicles.

- Ans a. select company, avg(charges) from carden group by company having capacity>3;  
b. select Company, count(\*) from carden group by Company;  
c. Select company, sum(charges) from carden group by company;  
1 mark each for correct answer

6) TABLE NAME : PHARMADB

TABLE NAME : PHARMADB

RxID	DrugID	DrugName	Price	PharmacyName	PharmacyLocation
R1000	5476	Amlodipine	100.00	Rx Pharmacy	Pitampura, Delhi
R1001	2345	Paracetamol	15.00	Raj Medicos	Bahadurgarh, Haryana
R1002	1236	Nebistar	60.00	MyChemist	Rajouri Garden, Delhi
R1003	6512	VitaPlus	150.00	MyChemist	Gurgaon, Haryana
R1004	5631	Levocitrezine	110.00	RxPharmacy	South Extension, Delhi

Write SQL commands to a & b and output for c:

- To display sum of price for each PharmacyName having more than 1 drug.
- Display pharmacy name in descending order of drug id
- SELECT PharmacyName, COUNT(\*) FROM PharmaDB GROUP BY PHARMACY NAME

Ans:-

- Select sum(price) from pharmadb group by pharmacyname having count(\*)>1;
  - Select PharmacyName from Pharmadb order by DrugID;
- ½ mark for the Select with sum(), ½ mark for the having clause
  - ½ mark for the Select, ½ mark for the order by clause

1 marks for correct output.

7) Consider a MySQL table 'product'

P_ID	PROD_NAME	PROD_PRICE	PROD_QTY
P01	Notebook	85	500
P02	Pencil Box	76	200
P03	Water Bottle	129	50
P04	School Bag	739	70

- Display maximum PROD\_QTY.
- Display the value of each product where the value of each product is calculated as PROD\_PRICE \* PROD\_QTY
- Display average PROD\_PRICE.

Ans:-

- SELECT MAX(PROD\_QTY) FROM product;
- SELECT PROD\_PRICE\*PROD\_QTY AS 'Value' FROM product;
- SELECT AVG(PROD\_PRICE) FROM product;

1 mark for each correct query

**[5 marks question]**

- 1) Write the SQL functions which will perform the following operations:
- i) To display the name of the month of the current date .
  - ii) To remove spaces from the beginning and end of a string, “ Panorama “.
  - iii) To display the name of the day eg, Friday or Sunday from your date of birth, dob.
  - iv) To display the starting position of your first name(fname) from your whole name (name).
  - v) To compute the remainder of division between two numbers, n1 and n2

OR

Consider a table SALESMAN with the following data:

SNO	SNAME	SALARY	BONUS	DATE OF JOIN
A01	Beena Mehta	30000	45.23	29-10-2019
A02	K. L. Sahay	50000	25.34	13-03-2018
B03	Nisha Thakkar	30000	35.00	18-03-2017
B04	Leela Yadav	80000	NULL	31-12-2018
C05	Gautam Gola	20000	NULL	23-01-1989
C06	Trapti Garg	70000	12.37	15-06-1987
D07	Neena Sharma	50000	27.89	18-03-1999

Write SQL queries using SQL functions to perform the following operations:

- a) Display salesman name and bonus after rounding off to zero decimal places.
- b) Display the position of occurrence of the string “ta” in salesman names.
- c) Display the four characters from salesman name starting from second character.
- d) Display the month name for the date of join of salesman
- e) Display the name of the weekday for the date of join of salesman

- Ans:-
- i) monthname(date(now()))
  - ii) trim(“ Panorama “)
  - iii) dayname(date(dob))
  - iv) instr(name, fname)
  - v) mod(n1,n2)

1 mark for each correct answer

OR

- i) Select sname, round(bonus,0) from Salesman;
- ii) Select instr(Sname, “ta”) from Salesman;
- iii) Select mid(Sname,2,4) from Salesman; alternative answer
- iv) Select Substring(Sname,2,4) from Salesman; iv) Select monthname(DateofJoin) from Salesman;
- v) Select dayname(DateofJoin) from Salesman;

1/2 mark each for correct usage of Select and round()

1/2 mark each for correct usage of Select and instr()

1/2 mark each for correct usage of Select and substr()

1/2 mark each for correct usage of Select and monthname()

1/2 mark each for correct usage of Select and dayname()



Note : Instead of substr() , substring() may be accepted as correct

2) Consider a table Teacher with the following data:

Table:TEACHER

No.	Name	Age	Department	Dateofadm	Salary	Sex
1	Jugal	34	Computer	10/01/97	12000	M
2	Sharmila	31	History	24/03/98	20000	F
3	Sandeep	32	Maths	12/12/96	30000	M
4	Sangeeta	35	History	01/07/99	40000	F
5	Rakesh	42	Maths	05/09/97	25000	M
6	Shyam	50	History	37/06/98	30000	M
7	Shivam	44	Computer	25/02/97	21000	M
8	Shalakra	33	Maths	31/07/97	20000	F

Write SQL queries using SQL functions to perform the following operations:

- Convert all the names into lower case.
- Display the position of occurrence of the string "sh" in Name.
- Display the four characters from Department starting from second character.
- Display the month name for the date of admission.
- Display the name of the weekday for the date of admission.

OR

Write the SQL functions which will perform the following operations:

- To display the day of month of current date.
- To remove spaces from the beginning and end of a string, " Informatics Practices ".
- To display the name of the day eg. Friday or Sunday from your date of birth, dob.
- To convert your name into Upper case.
- To compute the mode of two numbers num1 and num2.

Ans:-  
i. SELECT LOWER(NAME) FROM TEACHER;  
ii. SELECT INSTR(NAME, 'sh') FROM TEACHER;  
iii. SELECT MID(Department, 2,4) FROM TEACHER;  
iv. SELECT MONTHNAME(DateofAdm) FROM TEACHER;  
v. SELECT DAYNAME(DateofAdm) FROM TEACHER;

OR

i. SELECT DAYOFMONT(CURDATE());  
ii. SELECT TRIM(" Informatics Practices ");  
iii. SELECT DAYNAME("2015-07-27");  
iv. SELECT UPPER(Name);  
v. SELECT MOD(num1,num2);

3) Write the SQL functions which will perform the following operations:

- i) To display the name of the month of the current date.
- ii) To remove spaces from the beginning and end of a string, " KV Sangathan ".
- iii) To display the name of the day eg, Friday or Sunday from your date of birth, dob.
- iv) To print the value of square root of 2 upto 2 decimal points.
- v) To compute the remainder of division between two numbers, n1 and n2

OR

Write SQL for question from (i) to (iv) and output for SQL queries (v) and (vi), which are based on the table: KV given below:

KVCode	KVName	StationCode	Region	Zone
1603	Bharatpur	331	Jaipur	West
1595	Alwar	324	Jaipur	West
1596	Alwar Itarana	324	Jaipur	West
1019	Gandhidham IFFCO	11	Ahmedabad	West
1020	Gandhidham Railway	11	Ahmedabad	West
1769	Avadi AFS	584	Chennai	South
1702	Uri	390	Jammu	North
1296	Barnala AFS	172	Chandigarh	North

- (i) Print the details of KVs whose StationCode between 300 and 500
- (ii) Print the details of KVs whose name ends with AFS
- (iii) Print the details of KVs of Jaipur region
- (iv) Print the number of KVs Zone-wise
- (v) Select Region, count(KVName) from KV where Zone='West' group by Region
- (vi) Select \* from KV where substr(KVName, 2, 3)='and' or StationCode=390;

- (i) select month(current\_date());
- (ii) select trim(" KV Sangathan ");
- (iii) select dayname(dob) from student;
- (iv) select round(sqrt(2) , 2);
- (v) select n1 % n2;

Ans:-

OR

- (i) Select \* from KV where StationCode between 300 and 500;
- (ii) Select \* from KV where KVName like '%AFS';
- (iii) select \* from KV where Region='Jaipur';
- (iv) select Zone, count(KVName) from KV group by Zone;
- (v)
 

Region	count(KVName)
Ahmedabad	2
Jaipur	3
- (vi)

KVCode	KVName	StationCode	Region	Zone
1019	Gandhidham IFFCO	11	Ahmedabad	West
1020	Gandhidham Railway	11	Ahmedabad	West
1702	Uri	390	Jammu	North

4) Write the SQL statement for the following:

- i) To display names "Mr. James" and "Ms. Smith" in lower case.
- ii) To display current date and time.
- iii) To extract date from a given datetime value '2020-12-21 09:30:37'.
- iv) To remove trailing spaces from string " Technology Works "
- v) To compute the remainder of division between 125 and 17.

**OR**

Consider the following table Garments. Write SQL commands for the following statements.

Table : Garments

GCode	GName	Price	MCode	Launch_Date
10001	Formal Shirt	1250	M001	2008-12-12
10020	Frock	750	M004	2007-09-07
10007	Formal Pant	1450	M001	2008-03-09
10024	Denim Pant	1400	M003	2007-04-07
10090	T-Shirt	800	M002	2009-05-12

- a) To update the Price of Frock to 825.
- b) To print the average price of all the Garments.
- c) To display the Garments Name with their price increased by 15%.
- d) To delete the rows having MCode as M002.
- e) To display the details of all the Garments which have GCode less than 10030.

**Ans:-** (i) `select lower("Mr. James"), lower("Ms. Smith");`  
(ii) `select now();`  
(iii) `select date("2020-12-21 09:30:37");`  
(iv) `select rtrim(" Technology Works ");`  
(v) `select mod(125,17);`

**1 mark for each correct answer**

**OR**

- a. Update Garments set price=825 where GName='Frock';
- b. `select avg(price) from Garments;`
- c. `select DName, price*1.15 as 'Increased_Price' from Garments;`
- d. `delete from Garments where MCode='M002';`
- e. `select * from Garments where GCode<10030;`

**1 mark for each correct answer**

- 5) Write the SQL functions which will perform the following operations:
- i) To display the name of the month of your birthdate .
  - ii) To remove spaces from the beginning of a string, " Python".
  - iii) To display the day of the week eg, Sunday from current date.
  - iv) To display the starting 3 characters from your name .
  - v) To compute the power of 2 to the power 3

**OR**

**Consider the table : Shop**

Id	SName	Area	Bonus	DateofOpen
S001	ABC Computronics	CP	1000.89	2010-11-20
S002	All Infotech	GK II	2345.987	2015-09-12
S003	Tech Shoppe	CP	761.46	2013-07-25
S004	Geek Tenco Soft	Nehru Place	456.923	2019-10-10
S005	Hitech Solution	GK II	1000.025	2008-12-20

- Display shop name and bonus after rounding off to zero decimal places.
- Display the position of occurrence of the string "tech" in shop names.
- Display three characters from shop name starting from second character.
- Display the month name for the date of opening of shop
- Display the name of the shop in all capitals.

Ans:-  
 i)select monthname('1998-11-20');  
 ii)select ltrim(' Python');  
 iii)select dayname(now());  
 iv)select left('Nitin',3);  
 v)Select power(2,3);

1 mark each for correct function

OR

- Select Sname,round(Bonus,0) from Shop;
- Select instr(SName,'tech') from Shop;
- Select mid(SName,2,3) from Shop;
- Select monthname(DateOfOpen) from shop;
- Select Upper(SName) from shop;

1 mark each for the correct query

**6) Consider the following data frame of automobile**

index	company	body-style	wheel-base	num-of-cylinders	price	Dateofmanufacture
0	bmw	sedan	101.234	four	16925	1998-03-27
1	bmw	sedan	101.261	six	20970	1999-05-23
2	honda	sedan	96.538	four	12945	2000-03-02
3	honda	sedan	96.519	four	10345	2001-02-01
4	toyota	hatchback	95.727	four	5348	1999-03-01
5	toyota	hatchback	95.173	four	6338	2000-05-11

**Write SQL queries using SQL functions to perform the following operations:**

- Display company name and body wheel base after rounding off to nearest ten's decimalplaces.
- Display the position of occurrence of the string "dan" in body style.
- Display the 3 characters from company name starting from second character.
- Display the year of manufacturing for sedan;

**e) Display the name of the weekday for the manufacturing date.**

Ans:-

- a) Select company, round(wheel-base,-1) from automobile;
- b) Select instr(body-style,'dan') from automobile;
- c) Select substr(company,2,3) from automobile; /mid(company,2,3)
- d) Select year(dateofmanufacture) from automobile where body-style='sedan';
- e) Select dayname(dateofmanufacture) from automobile;

- a) 1/2 mark each for correct usage of Select and round()
- b) 1/2 mark each for correct usage of Select and instr()
- c) 1/2 mark each for correct usage of Select and substr()
- d) 1/2 mark each for correct usage of Select year and where clause

1/2 mark each

**7) Consider the below mentioned table of 'CLOTH'**

DCODE	DESCRIPTION	PRICE	MCODE	LAUNCHDATE
10001	FORMAL SHIRT	1250	M001	12-JAN-08
10020	FROCK	750	M004	09-SEP-07
10012	INFORMAL SHIRT	1450	M002	06-JUN-08
10019	EVENING GOWN	850	M003	06-JUN-08
10090	TULIP SKIRT	850	M002	31-MAR-07
10023	PENCIL SKIRT	1250	M003	19-DEC-08
10089	SLACKS	850	M003	20-OCT-08

Write the commands for the following:

- (i) Display first three letters of description e.g. 'FRO' for 'FROCK'
  - (ii) Display the description after removing leading spaces if any.
  - (iii) Display number of characters taken by each description.
  - (iv) Display the number of MCODE in the table.
  - (v) Display the day of the LAUNCHDATE. Eg. 'Monday', 'Tuesday' etc
- OR
- (i) Display total price of products launched in year 2008.
  - (ii) Display minimum price of product for each material code(MCODE).
  - (iii) Display the most recent LAUNCHDATE.
  - (iv) Display the description in lower case alphabets.
  - (v) Display remainder of price divided by 10.

# Computer Networks

**Introduction:**

Computer Network is a collection of autonomous computers interconnected by a single technology. Two or more computers are said to be interconnected if they are able to exchange information. A computer network is a system that connects independent computers in order to share information and resources.

**Brief History of Network**

- In 1967, ARPA (Advance Research Project Agency by Department of Defence) proposed the idea of ARPANET – a small network of computers.
- By 1969, ARPANET became reality that connect four nodes at University of California at Los Angeles (UCLA), University of California at Santa Barbara (UCSB), Stanford Research Institute (SRI) and University of Utah via IMPs ( Interface Message Processor – a specialized computer).
- In 1973, Vint Cerf and Bob Kahn presented paper outlined the protocol( Transmission Control Protocol) to achieve end-to-end delivery of packets.

**Advantage of Computer Network:**

- Central Storage of Data
- Sharing of Information
- Sharing of Resources(Hardware & Software)
- Reliability
- Communication
- Reduced Cost

**Disadvantage of Computer Network:**

- Computer networks require a specific setup
- Lack of Security
- Cost of network hardware and software

**Components of Data Communication:**

- Message – it information to be communicated
- Sender – The device which send the message
- Receiver – The device which receive the message
- Transmission media – It is physical path by which message travel from sender to receiver
- Protocol – It is set of rules that governs data communication. Actually it is agreement between the sender and receiver regarding various communication parameter.

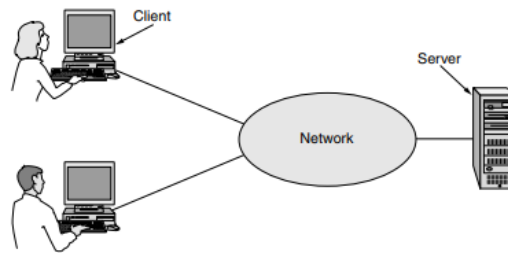
**Data Flow**

- Simplex – In this mode of communication, data is transmitted in one direction only. e.g. Keyboard, monitor. It uses entire capacity of channel to send the data.
- Half Duplex – Communication is bi-directional but not same time. i.e. Walkie-Talkie. It uses entire capacity of channel is utilized for each direction.

- Full Duplex – Communications is bi-directional simultaneously i.e. both sender and receiver can send data at same time.

### Network Terminology

- Node- The device connected to a network.
- Client – The device that request for a service
- Server – The Device that render the services
- Client-Server - In this model, the data are stored on powerful computers called **Server** that can be accessed by a much simpler computer called **Client** that are connected by a network.



- Network Interface Card or Unit (Network Adapter or LAN card) - It is hardware that allows a computer (or device) to connect to network.
- MAC (Media Access Control) address – Each NIC is assigned a unique 12 digit hexadecimal number, known a MAC address, is used as network address in communication. The format for the MAC address is

MM : MM : MM : SS : SS : SS

Manufacturer ID      Card Id

- IP Address: Every device on network has unique identifier called IP address. It consists of 4 bytes (IPv4) decimal number (between 0 to 255) separated by '.' (Period).
- Channel – It is communication path through which data is actually transmitted.
- Communication Media- It is allows data or signal to be communicated across the devices. It is means of communication.
- Data – Information stored within the computer system in form of '0' and '1'
- Signal- It is electric or electromagnetic encoding of data to be transmitted. It can be categorized into :
  - Analog Signal – that has infinitely many level of intensity over a period of time.
  - Digital Signal – that can have only a limited number of defined values.
- Bit rate – It defines the amount of data transferred. It is defined as number of bits per second (bps). [Bps – Bytes per Second]
- Baud – The number of changes in signal per second.
- Bandwidth – It is difference between the highest and the lowest frequencies contained in the signal.

### Mode of Transmission

- **Analog or Broadband Transmission**
  - It uses analog signals to transmit the information

- The data can be sent simultaneously using various frequencies.
- It is a unidirectional method of data transmission.
- Multiple signals can be transmitted using multiple frequencies using only one channel
- Signal range is long.
- Example- Used to transmit cable TV to premises

➤ **Digital or baseband Transmission**

- It uses digital signal (square wave) to transmit the information.
- It is bi-directional transmission.
- Entire bandwidth is for single signal transmission.
- Short distance signal travelling
- Ethernet is using Basebands for LAN

- Parallel Communication
- Series Communication
- Synchronous Transmission
- Asynchronous Transmission

**Switching Technique**

- A switched network consists of a series of interlinked nodes called switches capable of creating temporary connections between two or more liked devices.
- There are three basic switching technique
  - Circuit –Switching
  - Packet Switching
  - Message Switching

**Circuit Switching vs Packet Switching**

**Network Devices**

➤ **Modem**

- It stands for modulator and demodulator
- It a computer hardware device that converts data from a digital format into a format suitable for an analog.
- A modem transmits data by modulating one or more carrier wave signals to encode digital information, while the receiver demodulates the signal to recreate the original digital information.



➤ **Repeater**

- Repeaters are network devices that amplify or regenerate an incoming signal before retransmitting it.
- It operate at physical layer of the OSI model.
- The **repeater** allows to transfer the data through large area distance



➤ **Hub**

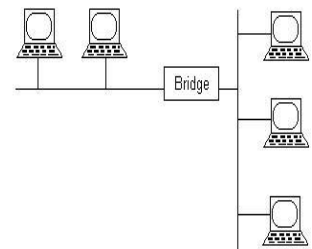
- It is a multiport device that allows multiple computers to communicate with each other over a network.
- It is a non-intelligent network device that sends message to all ports( i.e. Broadcast)
- **Types of Hub**
  - **Active Hub –**
    - It strengthen the signal may boost noise too.
    - It need electricity.
  - **Passive Hub –**
    - It repeat/copy signals.
    - It does not need electricity

➤ **Switch**

- Network Switch or switch is also a network multiport device that allow multiple computer to connect together.
- Network switch inspects the packet, determine source and destination address and route the packet accordingly.
- It operates at Data Link Layer (layer 2) of OSI model.

➤ **Bridge**

- It connects multiple network segments having same protocol
- It works at Data Link Layer (Layer 2).
- Bridge does not simply broadcast traffic from one network.
- Bridges use bridge table to send frames across network segments.
- It also improves the overall network performance.



➤ **Router**

➤ **Gateway**

➤ **RJ45**

➤ **Ethernet Card**

➤ **Wi-Fi card**

**Type of Network**

➤ **PAN**

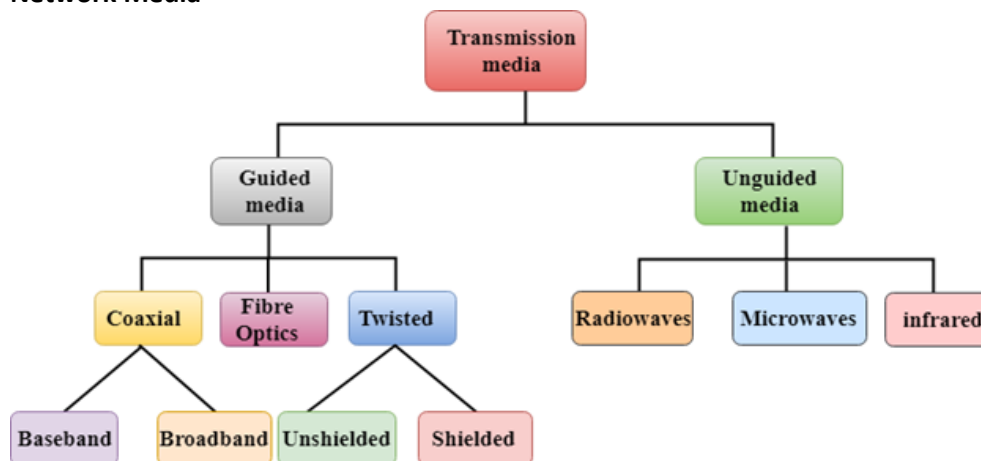
- It stands for Personal Area Network.
- It is a computer network formed around a person.
- It generally consists of a computer, mobile, or personal digital assistant.
- Appliances use for PAN: cordless mice, keyboards, and Bluetooth systems.
- PAN includes mobile devices, tablet, and laptop.

➤ **LAN**

- ❖ It is a group of computer and peripheral devices which are connected in a limited area such as room, building & campus.
- ❖ Higher Data Speed.
- ❖ Lower Error Rate.
- ❖ LANs are in a narrower geographic scope (upto 1 Km).
- ❖ It is a private network.

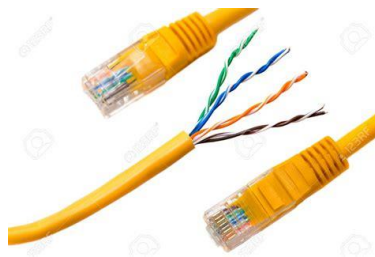
- MAN
  - ❖ A **Metropolitan Area Network** or MAN is consisting of a computer network that span across a city.
  - ❖ It mostly covers towns and cities in a maximum 50 km range.
  - ❖ The dual bus in MAN network provides support to transmit data in both directions concurrently.
  - ❖ Moderate Data Rate.
  - ❖ Moderate Error Rate.
  
- WAN
  - ❖ It connect device across globe.
  - ❖ It uses public network
  - ❖ Internet
  - ❖ BSNL
  - ❖ VSNL

### Network Media



### Twisted Pair Cable

- A twisted pair cable comprises of two separate insulated copper wires, which are twisted together and run in parallel.
  - ❖ A STP (Shielded Twisted Pair) cable has a fine wire mesh surrounding the wires to protect the transmission
  - ❖ UTP (Unshielded Twisted Pair) cable does not has a fine wire mess.
- It is also known as Cat# cable where # denote number. e.g. Cat6
- Connector : RJ 45



### Twisted Pair Cable – Advantages

- It is the least expensive medium of transmission for short distances.
- It is relatively easy to implement and terminate.

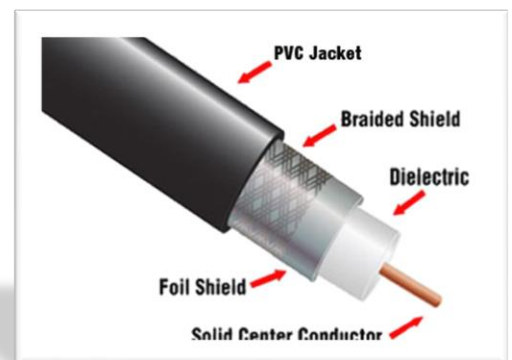
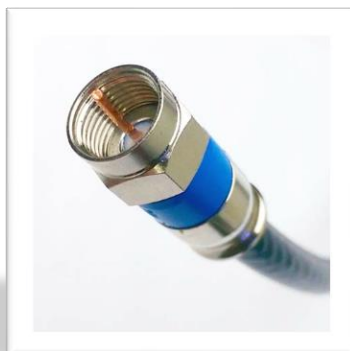
- It is flexible and lightweight.
- It is easy to set up and install.
- Less susceptible to electrical interference caused by nearby equipment or uses of wires.

#### Twisted Pair Cable – Disadvantages

- Attenuation is very high.
- It offers poor noise immunity as the result signal distortion is too much more.
- STP called shielded twisted pair cable is more difficult to connect to a terminating block.
- Susceptible to noise and interference.

#### Co-axial Cable

- Coaxial cabling has a single copper conductor at its center, and a plastic layer that provides insulation between the center conductor and a braided metal shield.
- Connector: BNC (Bayonet Neill-Concelman)



- The cost of a coaxial cable is less.
- Highly resistant to physical damage.
- Highly resistant to EMI.
- Great channel capacity.
- The transmission rate is high.
- It is less susceptible to noise interference compare to twisted pair.
- It is easy to wire and easy to expand to flexibility.
- It support high bandwidth signal transmission compare to twisted pair.
- It requires fewer repeater than twisted pair.

#### Co-axial Cable – Disadvantage:

- It is expensive to install.
- Cost maintenance is also high.
- Inflexible construction.
- Unsupported by newer networking standards.
- It is bulky.
- It has a more security problem.
- It does not support high-speed transmission.
- It must be grounded to prevent interference.
- In case of failure in one cable, the entire network will be down by using this wire.

#### Optical Fibre

- An optical fiber is a flexible, transparent fiber made by drawing glass or plastic to a diameter slightly thicker than that of a human hair.

- It uses light for data transmission using total internal reflection.

### **Optical Fibre- Advantages**

- Higher bandwidth
- Less signal attenuation
- Immune to cross-talk
- Optical fiber have long life more than 100 or above years
- Grater immune to tapping
- Resistance to corrosive material
- Long distance transmission is possible
- Immunity to electromagnetic interference

### **Optical Fibre-Disadvantage**

- Unidirectional propagation
- High initial cost
- Optical fiber more tensile stress than copper cables
- Installation and maintenance
- Fiber joining process is very costly and require skilled manpower
- Difficult to splice (join)
- Difficult to find error

### **Unguided Media or Wireless Media**

- No Physical media is used
- Less Secure
- Relatively low speed
- Can be used for longer distance
- Best suited for difficult terrain
- There is no need to acquire land rights

### **Radio Wave**

- Frequency – 3KHz – 1GHz
- Omni-Directional
- Penetrate obstacle
- Antenna of sender and receiver should not be aligned

### **Infrared**

- 300GHz to 400THz
- Line of sight- antenna of sender and receiver must be aligned
- Short distance communication
- It cannot penetrate obstacle – best suited for indoor
- Secure
- Support high data rate
- TV Remote

### **Microwave**

- 1GHz to 300 GHz
- Line of sight- antenna of sender and receiver must be aligned
- Cannot penetrate obstacles
- Rain or other disturbance cause issue with Microwave
- Types of microwave propagation
  - ❖ Terrestrial Microwave propagation
  - ❖ Satellite Microwave propagation

### Bluetooth

- It also uses radio waves
- 2.4 GHz
- Range 10mtr
- Short distance

### Topology

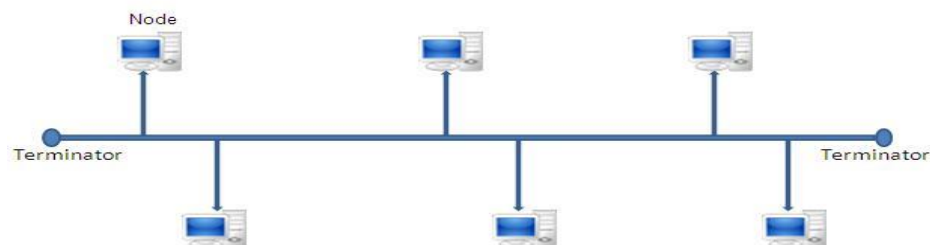
- Physical and Logical arrangement of nodes in the network is called Network Topology.
- The Key Elements to be considered to choose correct topology for your network
  - ❖ **Length of the Cable Needed** – longer the cable, more work is required for setup
  - ❖ **Cable Type**- Depending on requirement of bandwidth
  - ❖ **Cost**- Installation Cost and Complexity
  - ❖ **Scalability** – Ease of expansion
  - ❖ **Robustness** – Ability to recover from error

### Types of Topology

- Bus
- Ring
- Star
- Tree
- Mess
- Hybrid

### Bus Topology

- In Bus Topology all the nodes are connected to single cable or backbone
- Both the end have terminators.



### Advantage – Bus Topology

- It is easy to connect a device to the network.
- It require less cable length.

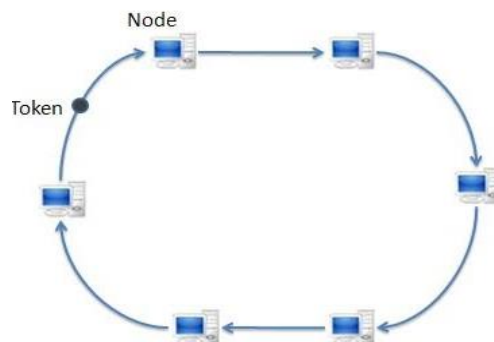
- Low setup cost
- There is no need of Hub/Switch.
- It can be extended easily.

#### **Disadvantage – Bus Topology**

- Failure of one node can shutdown entire network
- There is a limit on central cable length and number of nodes that can be connected.
- Difficult to find and correct errors
- Terminator is required.
- Maintenance costs can get higher with time.
- Not suitable for Big network.
- Low Security due to broadcasting of data.

#### **Ring Topology**

- In Ring Topology all the nodes are connected to each-other to form a loop.
- Each workstation is connected to two other components on either side
- It communicates with these two adjacent neighbors.
- Data is sent and received using Token.



#### **Advantage – Ring Topology**

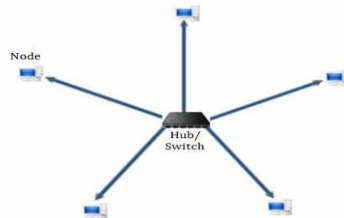
- It is easy to connect a device to the network.
- It require less cable length.
- Low setup cost
- There is no need of Hub/Switch
- Minimum collision
- Suitable for Optical Fibre Network

#### **Disadvantage – Ring Topology**

- Failure of one node can shutdown entire network
- There is a limit on central cable length and number of nodes that can be connected.
- Difficult to find and correct errors.
- Maintenance costs can get higher with time.
- Not suitable for Big network.
- Low Security due to broadcasting of data.
- Unidirectional

## Star Topology

- In Star Topology all the nodes are connected to a central device called Hub/Switch.
- All communication is controlled by the central Device( Hub/Switch)



## Advantages –Star Topology

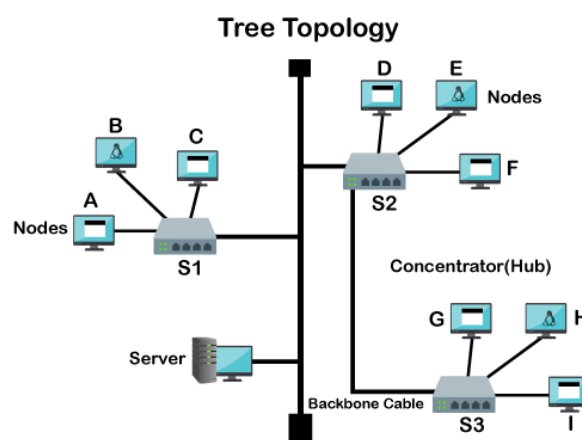
- Reliable
- Robust
- Failure of node does not affect the working of the network.
- Fault detection and isolation is easy.
- Maintenance of the network is easy.
- It doesn't create bottlenecks where data collisions occur.

## Disadvantages – Star Topology

- Require more cable length
- Central Device dependency
- More costly
- Performance depend on Hub/Switch

## Tree Topology

- In Tree Topology, the devices are arranged in a tree fashion similar to the branches of a tree.
- It multilayer architecture.



### **Advantages- Tree Topology**

- It is a combination of bus and star topology
- It provides high scalability, as leaf nodes can add more nodes in the hierarchical chain.
- Other nodes in a network are not affected, if one of their nodes get damaged
- It provides easy maintenance and fault identification.
- Point-to-point wiring for individual segments.

### **Disadvantages -Tree Topology**

- Large cabling is required as compared to star and bus topology.
- On the failure of a hub, the entire network fails.
- Tree network is very difficult to configure than other network topologies.

### **Protocol**

- It is set of rules or standard that governs communication.

### **Types of Protocol**

- **TCP/IP**
- **FTP**
- **HTTP/HTTPS**
- **IMAP**
- **POP3**
- **SMTP**
- **PPP**
- **TELNET**
- **VoIP**

### **TCP/IP – Transmission Control Protocol/ Internet Protocol**

- It is a protocol suite consist of two protocols **Transmission Control Protocol and Internet Protocol.**
- TCP ensures reliable transmission or delivery of packets on the network.
- TCP is state full protocol.
- IP is responsible for addressing of node on the network

### **HTTP (Hyper Text Transfer Protocol)**

- It is is an application-layer protocol for transmitting hypermedia documents, such as HTML.
- It is designed for communication between Client (Web Browser) and Web Server.
- It uses port number 80.
- It is stateless protocol.

### **HTTPS (Secure Hyper Text Transfer Protocol)**

- It is is an extension of HTTP protocol for transmitting hypermedia documents, such as HTML securely over a network.



- It encrypts data to be sent using TLS (Transport Layer Security)/SSL (Secure Sockets Layer).
- The default port is 443.

### **FTP (File Transmission Protocol)**

- It is used for the transfer of computer files among hosts over TCP/IP (internet).
- It allows access to directories or folders on remote computers.
- It uses client-server architecture.
- It is statefull protocol
- The default port is 21

### **Telnet (TERminal NETWork)**

- It is an application **protocol** that allows a user to communicate with a remote device.
- It uses port no 23

### **SMTP (Simple Main Transfer Protocol)**

- It is used to send mail from mail client to mail server over internet.
- It can send a single message to one or more recipients.
- Sending message can include text, voice, video or graphics.
- It is connection Oriented Protocol.

### **POP3 (Post Office Protocol)**

- It provides mechanism for retrieving emails from a remote server for a mail recipient.
- POP3 downloads the email from a server to a single computer, then deletes the email from the server.
- Default port for POP3 110 and secure port 995

### **IMAP (Internet Message Access Protocol)**

- It is also used to retrieve mail from mail server to client over internet (TCP/IP).
- It allows access to mail from different device.
- E-mail client establishes a connection with the server every time you log in and maintained for the whole session.
- Email will not automatically gets deleted.
- Default Port is – 143 and Secure port is 993.

## CHAPTER-5

# Introduction to web Services

Web browser:

- A web browser is a program or software or application that helps users to get the data and information from the webserver. Some commonly used web browsers are Google Chrome, Mozilla Firefox, Internet Explorer, Opera, Apple Safari etc.

Plug-in or Add on or Extension:

- A plug-in or add on or extension is software that adds additional functionality to your web browser. It adds a number of features to web browsers. For example, enable emoticons, reading pdfs, languages etc.

Domain names

- A domain name is a website's address on the Internet.
- Domain names are used in URLs to identify to which server belong a specific webpage.
- The domain name consists of a hierarchical sequence of names (labels) separated by periods (dots) and ending with an extension.

**URL :-** URL stands for Uniform Resource Locator. A URL is nothing more than the address of a given unique resource on the Web or address of a website. The URL is an address that matches users to a specific resource online, such as webpage. Example- <http://www.kvsangathan.nic.in>

**WWW :** The World Wide WEB (WWW), commonly known as the 'Web'. It is an information system where all the web resources are identified by Uniform Resource Locator (URL). Tim Berners- Lee invented the WWW in 1989. He wrote the first web browser in 1990. The World Wide WEB (WWW) or 'Web' is a collection of WebPages found over the internet. Web browser uses the internet to access the 'Web'.

**Application of Internet Web 2.0 :** The term web 2.0 is used to refer to a new generation of websites that are supposed to let people to publish and share information online. It aims to encourage the sharing of information and views, creativity that can be consume by the other users. E.g: Youtube

**The Main characteristics of web 2.0 are:**

- Makes web more interactive through online social media web- based forums, communities, social networking sites.
- It is a website design and development world which aim to encourage sharing of information and views, creativity and user interactivity between the users.
- Video sharing possible in the websites

**Web 3.0:**

- It refers to the 3rd Generation of web where user will interact by using artificial intelligence and with 3-D portals. Web 3.0 supports semantic web which improves web technologies to create, connect and share content through the intelligent search and the analysis based on the meaning of the words, instead of on the keywords and numbers.

### e-mail:

- email (or e-mail) is defined as the transmission of messages over communications networks. Typically the messages are notes entered from keyboard and sent over internet using computer or mobile.

**Chat :** Chat may refer to any kind of communication over the Internet that offers a real-time transmission of text messages from sender to receiver. Chat messages are generally short in order to enable other participants to respond quickly.

**VoIP :- Voice over Internet Protocol (VoIP), is a technology that allows you to make voice calls using a broadband Internet connection instead of a regular (or analog) phone line. VoIP services convert your voice into a digital signal that travels over the Internet.** If you are calling a regular phone number, the signal is converted to a regular telephone signal before it reaches the destination. VoIP can allow you to make a call directly from a computer. Examples of Voip:- Whatsapp, Skype, Google Chat etc.

### Advantage of VoIP:

- ✓ Save a lot of money.
- ✓ More than two people can communicate or speak.
- ✓ Supports great audio transfer.
- ✓ Provide conferencing facility.
- ✓ More than voice (can transfer text, image, video along with voice).

### Disadvantages of Voip:

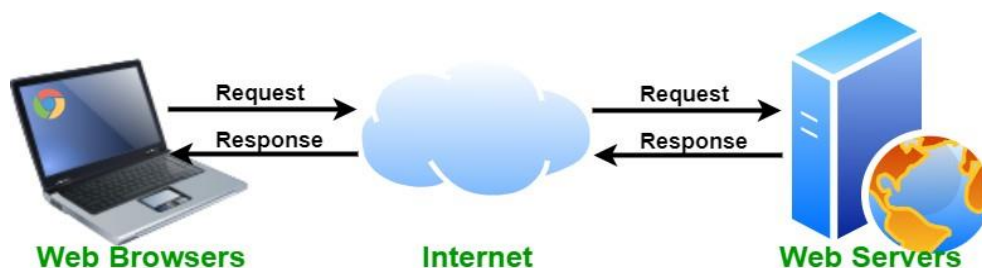
- ✓ Reliable Internet connection required.
- ✓ No location tracking for emergency calls.

**Website:-** a website is a group of web pages, containing text, images and all types of multi-media files.

**Web Server:** - A web server is a computer that stores web server software and a website's component files (e.g. HTML documents, images, CSS style sheets, and JavaScript files).

The basic objective of the web server is to store, process and deliver web pages to the users using Hypertext Transfer Protocol (HTTP). Apart from HTTP, a web server also supports SMTP (Simple Mail transfer Protocol) and FTP (File Transfer Protocol) protocol for e-mailing, for file transfer and storage.

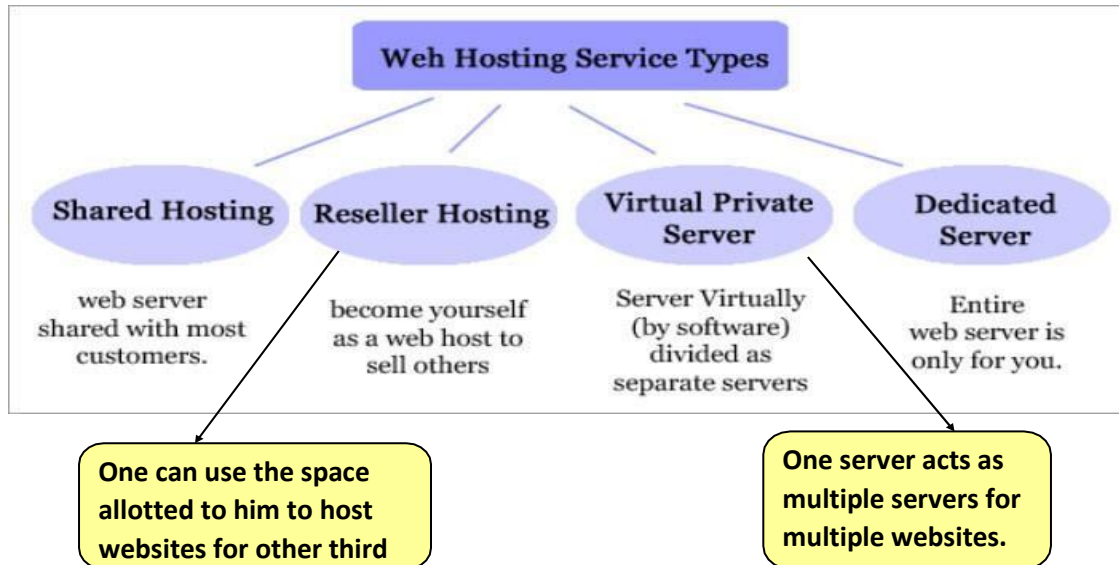
When client sends request for a web page, the web server search for the requested page if requested page is found then it will send it to client with an HTTP response. If the requested web page is not found, web server will the send an **HTTP response: Error 404 Not found**.



**Web Hosting :-** Web hosting is an online service that enables you to publish your website or web application on the internet. When you sign up for a hosting service, you basically rent some space on a server on which you can store all the files and data necessary for your website to work properly.

A server is a physical computer that runs without any interruption so that your website is available all the time for anyone who wants to see it.

### Types of Web Hosting:



**Web Browser :-** A web browser, or simply "browser," is an application used to access and view websites. Common web browsers include Microsoft Internet Explorer, Google Chrome, Mozilla Firefox, and Apple Safari.

**Plug-ins: -** a **plug-in** (or **plugin**, **add-in**, **add-on**) is a software component that adds a specific feature to an existing computer program. When a program supports plug-ins, it enables customization. Plug-ins are commonly used in Internet browsers but also can be utilized in numerous other types of application

**Add-ons (in terms of H/W):** An Add-on is either a hardware unit that can be added to a computer to increase the capabilities or a program unit that enhances primary program. Some manufacturers and software developers use the term add-on.

**Cookies: -** cookies are small files which are stored on a user's computer and contains information like which Web pages visited in the past, logging details Password etc. They are designed to hold a modest amount of data specific to a particular client and website and can be accessed by the web server or the client computer.

## Chapter Practice:

### Very Short Answer Question (for 1 Mark)

Q.1 \_\_\_\_\_ Topology is based on a central network which acts as hub.

Ans. Star

Q.2 \_\_\_\_\_ is larger than LAN and smaller than WAN

Ans. MAN

Q.3 A computer network can categorized by their

Ans. Size

Q.4 \_\_\_\_\_ connects multiple computer networking devices together

Ans. Hub

Q.5 Gateway is network device used to connect two or more \_\_\_\_\_ networks.

Ans. dissimilar

Q.6 In \_\_\_\_\_ topology, single cable is used to connect all the workstations.

Ans. Bus

Q.7 Repeaters work on the \_\_\_\_\_ layer.

Ans. Physical

Q.8 \_\_\_\_\_ network is owned by a single organization.

Ans. LAN (Local Area Network)

Q.9 What is a purpose of server in a network?

Ans. A Server manages network resources in a network.

Q.10 What is the purpose of switch in a network?

Ans. Switch is used to connect multiple LANs together.

Q.11 What is the name of the network topology in which each node is connected independently using a switch?

Ans. Star Topology.

Q.12 Expand WAN and MAN

Ans.

WAN – Wide Area Network

MAN – Metropolitan Area Network

Q.13 Two students in the same class sitting inside the same room have connected their laptops using Bluetooth for working on a group presentation.

Ans, PAN (Personal Area Network)

Q.14 Which type of network out of LAN, PAN and MAN is formed, when you connect two mobile using Bluetooth to transfer a video?

Ans. PAN (Personal Area Network)

Q.15 Which device is used to connect all computers inside a lab?

Ans. Hub or Switch

Q.16 Expand the following

(i) LAN (ii) PAN

Ans.

LAN- Local Area Network

PAN- Personal Area Network.

Q.17 Internet is an example of which topology:

Star, Mesh , Tree, Bus

Ans. Mesh

Q.18 \_\_\_\_\_ Network device is a broadcast device.

Ans. Hub

Q.19 Which of the following is not a Geographically type of network?

LAN, MAN, PAN, TAN, Wi Max, WAN

Ans. TAN

Q.20 To prevent unauthorized access to and / or from the network, a system known as \_\_\_\_\_, can be implemented by hardware and / or software.

Ans. Firewall

Q.21 \_\_\_\_\_ is computer network i.e., network of networks.

Ans. Internet

Q.22 \_\_\_\_\_ is a unique identifier used to locate a resource on the Internet.

Ans. URL

Q.23 World Wide Web was begun in 1989 by \_\_\_\_\_.

Ans. Tim Beners-Lee

Q.24 \_\_\_\_\_ field indicates the purpose of e-mail.

Ans. Subject

Q.25 \_\_\_\_\_ symbol separates the user from the domain.

Ans. @

Q.26 \_\_\_\_\_ is the hub of Internet chatting.

Ans. Chat room

Q.27 VoIP stands for \_\_\_\_\_

Ans. Voice over Internet Protocol

Q.28 A Website is a collection of \_\_\_\_\_.

Ans. Web Pages.

Q.29 Write one example of each of URL and IP address.

Ans.

URL : <https://www.cbse.nic.in/welcome.html>

IP address : 122.176.185.219

Q.30 How is a domain name different from a URL

Ans. Domain names are used in URLs to identify particular web servers.

For example

In the URL : <https://www.cbse.nic.in/welcome.html> the domain name is [www.cbse.nic.in](http://www.cbse.nic.in)

### Short Answer Question (for 2 Mark)

**Q1. Differentiate between IP Address vs MAC Address?**

**Ans:**

IP Address	MAC Address
It is of 4 bytes	It is of 6 bytes
Represented by decimal number	Represented by hexadecimal number
It is logical address	It is physical address
It is variable address	It is fixed address
It is assigned only when a device is	It is assigned by manufacturer of the card
Command to know the IP address is	Command to know the IP address is

**Q.2** What is a server?

Ans. A server is a computer or system that provides resources, data, services or programs to other computers, known as clients over a network. A server may be designed to do a single task such as mail server, which accepts and store email and then provides it to a requesting client.

**Q3.** Define the following terms.

(a) ARPANET (b) ISP (c) URL

**Ans.**

(a) ARPANET stands for Advanced Research Projects Agency Network.

(b) ISP stands for Internet Service Provider

(c) URL stands for Uniform Resource Locator

**Q4.** Define home page. Give two advantages of home page.

**Ans.** A home page is the first page of a website. Two advantages of home page are as follows:

(i) It helps viewers to find out what they can find on that site.

(ii) Publicity of an individual or a community.

**Q5.** Sahil, a Class X student, has just started understanding the basics of Internet and web technologies. He is a bit confused in between the terms “World Wide Web” and “Internet”. Help him in understanding both the terms with the help of suitable examples of each.

**Ans.** **World Wide Web** is a set of programs, standards and protocols that allows the multimedia and hypertext files to be created, displayed and linked on the Internet. e.g. www.microsoft.com, www.amazon.com, etc.

**Internet** is a computer-based world wide communications network, which is composed of large number of smaller interconnected networks. e.g. Web, E-mails, Social media, etc. While Internet is a collection of computers or networking devices connected together; WWW is a collection of documents, linked *via* special links called hyperlinks. WWW forms a large part of Internet but is not the Internet.

**Q6.** Ruhani wants to edit some privacy settings of her browser. How can she accomplish her task?

**Ans.** She can accomplish her task by performing following steps

**Step 1** Open your web browser.

**Step 2** Open browser settings.

**Step 3** Look for Privacy and Security settings. If not directly found, click on Advanced settings.

**Step 4** After reaching Privacy and Security settings she can edit their setting.

**Q7. What is the difference between Website and Webpage**

**Ans:**

Website	Webpage
1. A collection of web pages which are grouped together and usually connected together in various ways, Often called a "web site" or simply a "site."	A document which can be displayed in a web browser such as Firefox, Google Chrome, Opera, Microsoft Internet Explorer etc.
2. Has content about various entity.	Has content about single entity.
3. More development time is required.	Less development time is required.
4. Website address does not depend on Webpage address.	Webpage address depends on Website address.

**Q8. What is the difference between Static and Dynamic webpage?**

**Ans:**

Static Webpage	Dynamic Webpage
The static web pages display the same content each time when someone visits it.	In the dynamic Web pages, the page content changes according to the user.
It takes less time to load over internet.	Dynamic web pages take more time while loading.
No Database used.	A database is used in at the server end in a dynamic web page.
Changes rarely.	Changes frequently.

**Q.9** Define Voice over Internet Protocol (VoIP). Also, explain its advantages.

**Ans.** VoIP is an IP telephony term for a set of facilities used to manage the delivery of voice information over Internet. It enables a user to make cheap telephone calls over a broadband Internet connection, instead of using a regular telephone service. A major advantage of VoIP is that avoids the tolls charged by ordinary telephone service. A user can make a call locally or in other parts of US or Canada, or anywhere else in the world, eliminating long distance fees by using a VoIP service. The concept of VoIP is used in wireless LAN networks and sometimes referred to as WVoIP, VoFI, VoWi-Fi and Wi-Fi VoIP.

**Advantages of VoIP**

- (i) The biggest single advantage of VoIP has over standard telephone systems is low cost.
- (ii) Using services such as true VoIP, subscribers can call one another at no cost to other party.
- (iii) Routing phone calls over existing data networks eliminate the need for separate voice and data networks.
- (iv) The ability to transmit more than one telephone call over a single broadband connection.
- (v) VoIP consists advance telephone features, e.g. call routing, screen POP and IVR.

**Q10.** What is website? Also, write its components.

**Ans.** A website is a collection of digital documents, primarily HTML files, that are linked together and that exist on the web under the same domain. A website displays related information on a specific topic. Each website is accessed by its own address known as URL (Uniform Resource Locator).

**Components of a website**

- (i) **Web host** Group of linked web pages qualify to be called a website only when hosted on a web server.
- (ii) **Address** This is the address of the website (also called URL of the website).
- (iii) **Home page** Every website has a home page. It is the first web page that appears when viewers go to a website.
- (iv) **Design** It is the overall look and feel the website has a result of proper use and integration elements like navigation menus, layout etc.
- (v) **Content** All the web pages contained in the website together make up the content of the website.
- (vi) **Navigation Structure** The navigation structure of a website is order of the pages, the collection of what

**Q11.** XYZ consultancy is planning to link its branch office in Delhi to its head office in London. Write one way to connect. What type of network (out of LAN/WAN/MAN) will be formed.

**Ans.** (i) Satellite communication  
(iii) WAN (Wide Area Network)

**Q12.**What is the differences between LAN and WAN ?

**Ans.**

	<b>LAN (Local Area Network)</b>	<b>WAN (Wide Area Network)</b>
(i)	It is owned by a private organization.	It is owned by multiple Organizations.
(ii)	Diameter of less than a few kms.	Span entire countries.

**Q13.** What is the difference between PAN and LAN?

**Ans.**

	<b>PAN</b>	<b>LAN</b>
(i)	PAN stands for Personal Area Network	LAN stands for Local Area Network
(ii)	It spans a few meters	It Spans upto a km.



**Long Answer Question (for 3/4 Mark)**

**Q.1** ABC Pvt. Ltd. Is setting up the network in the Bengaluru. There are four departments named as Market, Finance, Legal and Sales.

Distance between various Departments building is as follows :

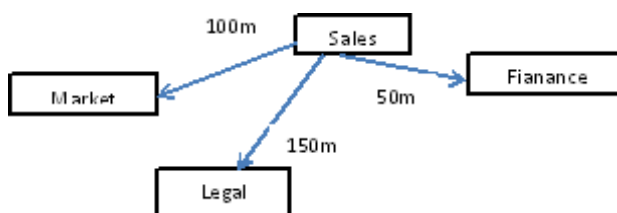
From	To	Distance
Market	Finance	80 mt
Market	Legal	180 mt
Market	Sales	100 mt
Legal	Sales	150 mt
Legal	Finance	100 mt
Fianance	Sales	50 mt

Number of computers in the buildings :

Building	No. of Computers
Market	20
Legal	10
Finance	08
Sales	42

- (i) Suggest a cable layout of connections between the departments building and specify the topology.
- (ii) Suggest the most suitable building to place server by giving suitable reason.
- (iii) Suggest the placement of (i) modem (ii) hub/switch in the network.
- (iv) The organization is planning to link its sales counter situated in various part of the same city, which type of network out of LAN, WAN, MAN will be formed? Justify your answer.

**Ans. (i)**



Star topology should be used.

- (ii) Sales is the most suitable building to place the server because it has maximum number of computers.
- (iii) Each Building should have hub/switch and modem in case internal connection is required.
- (iv) MAN (Metropolian Area Network) as this network can be carried out in a city network.

**Q.2** Delhi Public School in Meerut is starting up the network between its different wings. There are four building named as S, J, A and H. The distance between various buildings is as follows :

From	To	Distance
A	S	200 m
A	J	150 m
A	H	50 m
S	J	250 m
S	H	350 m
J	H	350 m

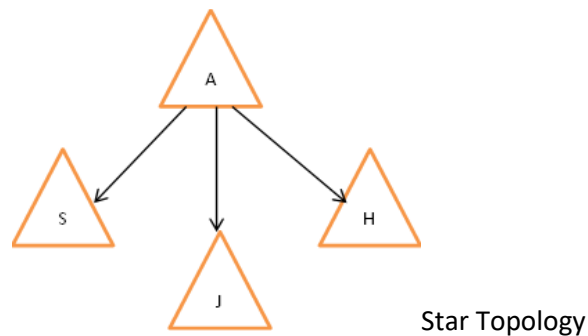
Number of computers in the buildings :

Building	No. of Computers
S	130
J	80
A	160
H	50

- (i) Suggest the cable layout of connections between the buildings.
- (ii) Suggest the most suitable place (i.e. building) to house the server of this school, provide a suitable reason.
- (iii) Suggest the placement of the following devices with justification
  - Repeater
  - Hub/Switch
- (iv) The organization also has enquiry office in another city about 50-60 km away in hilly region. Suggest the suitable transmission media to inter-connect school and enquiry office out of the following :
  - Fibre optic cable.
  - Micro wave.
  - Radio wave.

**Ans**

(i)



- (ii) Server can be placed in the A building as it has the maximum number of computers
- (iii) Repeater can be placed between A and S buildings as the distance is more than 100 m
- (iv) Radio waves can be used in hilly region as they can travel through obstacles.

**Q.3** Rovenza Communication International (RCI) is an online corporate training provider company for IT related course. The company is setting up their new campus in Kolkata. You as a network expert have to study the physical locations of various blocks and the number of computers to be installed. In the planning phase, provide the best possible answers for the queries (i) to (iv) raised by them.

Block to block distance (in meters)

From	To	Distance
Administrative	Finances	60
Administrative	Faculty studio	120
Finances	Faculty studio	70

Expected computers to be installed in each block

Building	No. of Computers
Administrative	20
Finances	40
Faculty studio	120

- (i) Suggest the most appropriate block, where RCI should plan to install the server.
- (ii) Suggest the most appropriate block to block cable layout to connect all three blocks for efficient communication.
- (iii) Which type of network out of the following is formed by connecting the computers of these three blocks A. LAN B.MAN C.WAN
- (iv) Which wireless channel out of the following should be opted by RCI to connect to students from all over the world:  
A. Infrared B.Microwave C. Staellite.

**Ans.**

- (i) Faculty Studio.
- (ii)



- (iv) LAN (Local Area Network)
- (v) Satellite connection

Q.4 XYZ is professional consultancy company. The company is planning to set up their new offices in India with its hub at Pune. As a network adviser, you have to understand their requirement and suggest them to best available solutions. Their queries are mentioned as (i) to (iv) below :  
Physical Location of the blocks of XYZ



Block to block distance (in meters):

From	To	Distance
Human Resource	Conference	110
Human Resource	Finance	40

Conference	Finance	80
------------	---------	----

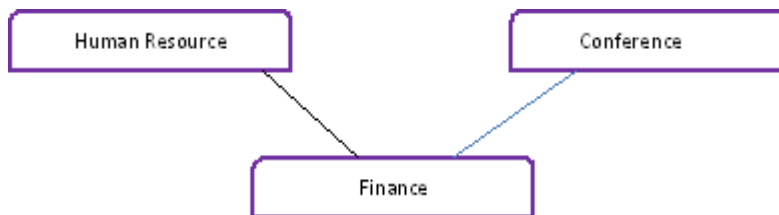
Expected number of computers to be installed in each block

Building	No. of Computers
Huma Resource	25
Fianance	120
Confernce	90

- (i) What will be the most appropriate block, where XYZ should plan to install their server?
- (ii) Draw a block diagram showing cable layout to connect al the buildings in the most appropriate manner for efficient communication.
- (iii) What will be the best possible connectivity out of the following you will suggest to connect the new setup of offices in Chennai with its London based office.
  - Satellite link
  - Infrared
  - Ethernet Cable.
- (iv) Which of the following device will be suggested by you to connect each computer in each of the buildings?
  - Switch
  - Modem
  - Gateway

**Ans:**

- (i) Finance block because it has maximum number of computers.
- (ii)



- (iii) Satellite Link
- (iv) Switch

Q.5 Uplifting skills Hub India is a knowledge and skill community which has an aim to uplift the standard of knowledge and skills in the society. It is planning to setup its training centres in multiple towns and villages in India with its head office in the nearest cities. They have created a model of their network with a city a town and 3 villages as follows. As a network consultant, you have to suggest the best network related solutions for their issues problems raised in (i) to (iv) keeping in mind that distance between various location and given parameters.



Shortest distance between various location :

From	To	Distance
Village1	B-Town	2 km
Village2	B-Town	1.0 km
Village3	B-Town	1.5 km
Village 1	Village 2	3.5 km
Village 1	Village 3	4.5 km
Village 2	Village 3	2.5 km
A_City Head Office	B_Hub	25 km

Number of computers installed at various locations are as follows:

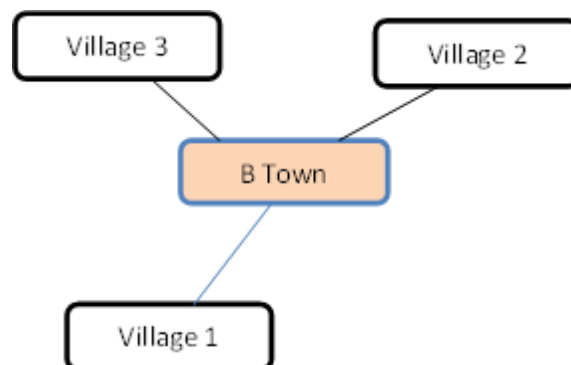
Location	No. of Computers
B_Town	120
Village1	15
Village2	10
Village3	15
A_City Head Office	06

Note:

- In Villages, there are community centres, in which one room has been given as training centre to this organization to install computers.
  - The organization has get financial support form the government and top IT companies.
- (i) Suggest the most appropriate locations of the SEVER in the B\_HUB out of 4 locations, to get the best and effective connectivity. Justify your answer.
  - (ii) Suggest the best wired medium and draw the cable various locations with the B\_HUB
  - (iii) Which hardware device will you suggest to connect all the computers within eact location of B\_HUB
  - (iv) Which service/protocol will be most helpful to conduct live interactions of experts from Head\_Office and people at all location of B\_HUB?

**Ans.**

- (i) B\_TOWN can house the server as it has the maximum no. of computers.
- (ii) Optical Fibre cable is the best for the star topology.



- (iii) Switch
- (iv) VoIP

## CHAPTER-6

### CBSE SAMPLE PAPER 2021-22(TERM-2)

#### Sample Question Paper

#### INFORMATICS PRACTICES (Code : 065)

Maximum Marks: 35

Time: 2 hours

#### General Instructions

- The question paper is divided into 3 sections – A, B and C
- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions( 11-13). Each question carries 4 marks.
- Internal choices have been given for question numbers – 1 , 3, 8 and 12.

Section –A			
Each question carries 2 marks			
Q. No	Part No.	Question	Marks
1.		<p>Aman, a freelance web site developer, has been assigned a task to design few web pages for a book shop. Help Aman in deciding out of static web page and dynamic web page, what kind of web pages should be designed by clearly differentiating between static and dynamic web pages on at least two points.</p> <p><b>OR</b></p> <p>Priyanka, a beginner in IT field has just started learning web technologies. Help her in understanding the difference between website and web pages with the help of a suitable general example of each.</p>	(2)
2.	(i)	<p>I :</p> <ul style="list-style-type: none"><li>• am a small text file</li><li>• created on a user's computer</li><li>• contain small pieces of data — like a username, password and user's browsing history as well as preferences</li><li>• may help to improve user's web browsing experience.</li></ul> <p>Who am I?</p>	(1)
	(ii)	Name any two popular web browsers.	(1)

3.	<p>Predict the output of the following queries:  <b>i. Select power(5,3);</b>  <b>ii. Select mod(5,3);</b></p> <p style="text-align: center;"><b>OR</b></p> <p>Briefly explain the purpose of the following SQL functions:  i. power()  ii. mod()</p>	(2)																																								
4.	<p>Navya has just created a website for her company and now need to host it. Briefly discuss the role of a web server in hosting a website.</p>	(2)																																								
5.	<p>Help Reshma in predicting the output of the following queries:  <b>i) select round(8.72,3);</b>  <b>ii) select round(9.8);</b></p>	(2)																																								
6.	<p>Aryan, a database administrator, has grouped records of a table with the help of group by clause.</p> <p>He needs to further filter groups of records generated through group by clause.</p> <p>Suggest suitable clause for it and properly explain its usage with the help of an example.</p>	(2)																																								
7.	<p>Mr. Som, a HR Manager in a multinational company “Star-X world” has created the following table to store the records of employees:  <b>Table: Emp</b></p> <table border="1"> <thead> <tr> <th>Eid</th> <th>EName</th> <th>Department</th> <th>DOB</th> <th>DOJ</th> </tr> </thead> <tbody> <tr> <td>Star1</td> <td>Ivan</td> <td>Sales</td> <td>1994-08-28</td> <td>2020-02-14</td> </tr> <tr> <td>Star2</td> <td>Melinda</td> <td>IT</td> <td>1997-10-15</td> <td>2021-11-19</td> </tr> <tr> <td>Star3</td> <td>Raj</td> <td>Accounts</td> <td>1998-10-02</td> <td>2019-04-02</td> </tr> <tr> <td>Star4</td> <td>Michael</td> <td>Sales</td> <td>2000-02-17</td> <td>2020-05-01</td> </tr> <tr> <td>Star5</td> <td>Sajal</td> <td>IT</td> <td>2001-12-05</td> <td>2018-06-13</td> </tr> <tr> <td>Star6</td> <td>John</td> <td>Accounts</td> <td>1995-01-03</td> <td>2019-07-15</td> </tr> <tr> <td>Star7</td> <td>Julia</td> <td>Sales</td> <td>1985-11-13</td> <td>2020-08-19</td> </tr> </tbody> </table> <p>He has written following queries:  <b>i) select max(year(DOB)) from emp;</b>  <b>ii) select ENAME from emp where month(DOJ)=11;</b></p> <p>Predict the output.</p> <p style="text-align: center;"><b>OR</b></p>	Eid	EName	Department	DOB	DOJ	Star1	Ivan	Sales	1994-08-28	2020-02-14	Star2	Melinda	IT	1997-10-15	2021-11-19	Star3	Raj	Accounts	1998-10-02	2019-04-02	Star4	Michael	Sales	2000-02-17	2020-05-01	Star5	Sajal	IT	2001-12-05	2018-06-13	Star6	John	Accounts	1995-01-03	2019-07-15	Star7	Julia	Sales	1985-11-13	2020-08-19	(2)
Eid	EName	Department	DOB	DOJ																																						
Star1	Ivan	Sales	1994-08-28	2020-02-14																																						
Star2	Melinda	IT	1997-10-15	2021-11-19																																						
Star3	Raj	Accounts	1998-10-02	2019-04-02																																						
Star4	Michael	Sales	2000-02-17	2020-05-01																																						
Star5	Sajal	IT	2001-12-05	2018-06-13																																						
Star6	John	Accounts	1995-01-03	2019-07-15																																						
Star7	Julia	Sales	1985-11-13	2020-08-19																																						

	Based on the table given above, help Mr. Som writing queries for the following task: i) To display the name of eldest employee and his/her date of birth. ii) To display the name of those employees whose joining month is May.																															
	<b>SECTION – B</b> <b>Each question carries 3 marks</b>																															
8.	<p>Predict the output of the following queries:</p> <ol style="list-style-type: none"> <li><code>select instr('exams@cbse.nic.in','');</code></li> <li><code>select substr('exams@cbse.nic.in',7,4);</code></li> <li><code>select left('exams@cbse.nic.in',5);</code></li> </ol> <p style="text-align: center;"><b>OR</b></p> <p>Ms.Saumya is working on a MySQL table named 'Hotel' having following structure:</p> <table border="1" style="background-color: #f0f0f0; border-collapse: collapse; width: 100%;"> <thead> <tr> <th>Field</th> <th>Type</th> <th>Null</th> <th>Key</th> <th>Default</th> <th>Extra</th> </tr> </thead> <tbody> <tr> <td>user_id</td> <td>varchar(20)</td> <td>YES</td> <td></td> <td>NULL</td> <td></td> </tr> <tr> <td>name</td> <td>varchar(20)</td> <td>YES</td> <td></td> <td>NULL</td> <td></td> </tr> <tr> <td>city</td> <td>varchar(20)</td> <td>YES</td> <td></td> <td>NULL</td> <td></td> </tr> <tr> <td>mobile_no</td> <td>varchar(11)</td> <td>YES</td> <td></td> <td>NULL</td> <td></td> </tr> </tbody> </table> <p>She need to perform following task on the table:</p> <ol style="list-style-type: none"> <li>To fetch last 2 characters from the user_id column.</li> <li>To display the values of name column in lower case.</li> <li>To display 3 characters from 3<sup>rd</sup> place from the column city.</li> </ol> <p>Suggest suitable SQL function for the same. Also write the query to achieve the desired task.</p>	Field	Type	Null	Key	Default	Extra	user_id	varchar(20)	YES		NULL		name	varchar(20)	YES		NULL		city	varchar(20)	YES		NULL		mobile_no	varchar(11)	YES		NULL		(3)
Field	Type	Null	Key	Default	Extra																											
user_id	varchar(20)	YES		NULL																												
name	varchar(20)	YES		NULL																												
city	varchar(20)	YES		NULL																												
mobile_no	varchar(11)	YES		NULL																												
9.	<p>Reena is working with functions of MySQL. Explain her following:</p> <ol style="list-style-type: none"> <li>What is the purpose of now () function?</li> <li>How many parameters does it accept?</li> <li>What is the general format of its return type?</li> </ol>	(3)																														
10.	<p>While dealing with string data type in MySQL, its observed that sometimes unnecessary space character comes in between which hampers the successful execution of a string manipulation module. Name the suitable MySQL function (s) to remove leading, trailing and both type of space characters from a string. Also give MySQL queries to depict the same.</p>	(3)																														
	<b>Section C</b>																															



Each question carries 4 marks

11.

Carefully observe the following table named 'stock':

(4)

**Table: stock**

Pid	PName	Category	Qty	Price
1	Keyboard	IO	15	450
2	Mouse	IO	10	350
3	Wifi-router	NW	5	2600
4	Switch	NW	3	3000
5	Monitor	O	10	4500
6	Printer	O	4	17000

Write SQL queries for the following:

- To display the records in decreasing order of price.
- To display category and category wise total quantities of products.
- To display the category and its average price.
- To display category and category wise highest price of the products.

12.

Satyam, a database analyst has created the following table:

(4)

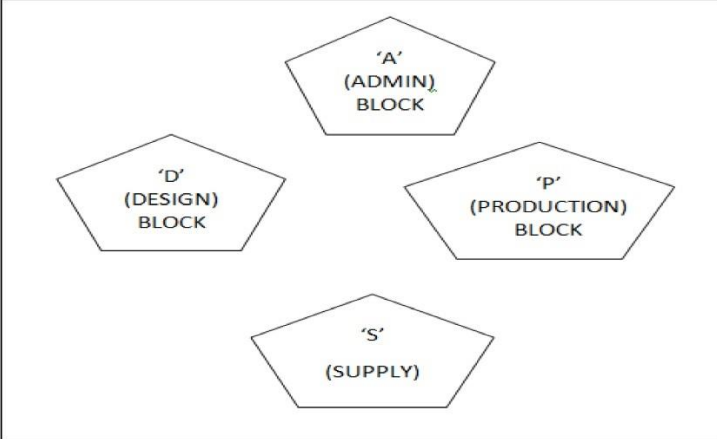
**Table: Student**

RegNo	SName	Stream	Optional	Marks
S1001	Akshat	Science	CS	99
S1002	Harshit	Commerce	IP	95
S1003	Devika	Humanities	IP	100
S1004	Manreen	Commerce	IP	98
S1005	Gaurav	Humanities	IP	82
S1006	Saurav	Science	CS	NULL
S1007	Bhaskar	Science	CS	95
S1007	Bhaskar	Science	CS	96

He has written following queries:

- select sum(MARKS) from student where OPTIONAL= 'IP' and STREAM= 'Commerce';
- select max(MARKS)+min(MARKS) from student where OPTIONAL= 'CS';
- select avg(MARKS) from student where OPTIONAL= 'IP';
- select length(SNAME) from student where MARKS is NULL;

	<p>Help him in predicting the output of the above given queries.</p> <p style="text-align: center;"><b>OR</b></p> <p>Based on the above given table named 'Student', Satyam has executed following queries:</p> <p>Select count(*) from student; Select count(MARKS) from student;</p> <p>Predict the output of the above given queries. Also give proper justifications of the output generated through each query.</p>																					
13.	<p>"Anutulya Creations"-A start-up fashion house has set up its main centre at Kanpur, Uttar Pradesh for its dress designing, production and dress supplying activities. It has 4 blocks of buildings.</p> <p>Distance between the various blocks is as follows:</p> <table style="margin-left: 40px;"> <tr><td>A to D</td><td>50 m</td></tr> <tr><td>A to P</td><td>60 m</td></tr> <tr><td>A to S</td><td>110m</td></tr> <tr><td>D to S</td><td>60m</td></tr> <tr><td>P to S</td><td>50m</td></tr> <tr><td>P to D</td><td>150m</td></tr> </table> <p>Numbers of computers in each block</p> <table style="margin-left: 40px;"> <tr><td>Block A -</td><td>20</td></tr> <tr><td>Block D -</td><td>80</td></tr> <tr><td>Block P -</td><td>15</td></tr> <tr><td>Block S -</td><td>8</td></tr> </table>	A to D	50 m	A to P	60 m	A to S	110m	D to S	60m	P to S	50m	P to D	150m	Block A -	20	Block D -	80	Block P -	15	Block S -	8	(4)
A to D	50 m																					
A to P	60 m																					
A to S	110m																					
D to S	60m																					
P to S	50m																					
P to D	150m																					
Block A -	20																					
Block D -	80																					
Block P -	15																					
Block S -	8																					

		
	<p>Based on the above specifications, answer the following questions:</p> <ol style="list-style-type: none"> <li>(a) Out of LAN, WAN and MAN, what type of network will be formed if we interconnect different computers of the campus? Justify.</li> <li>(b) Suggest the topology which should be used to efficiently connect various blocks of buildings within Kanpur centre for fast communication. Also draw the cable layout for the same.</li> <li>(c) Suggest the placement of the following device with justification <ol style="list-style-type: none"> <li>i. Repeater</li> <li>ii. Hub/Switch</li> </ol> </li> <li>(d) Now a day, video-conferencing software is being used frequently by the company to discuss the product details with the clients. Name any one video conferencing software. Also mention the protocol which is used internally in video conferencing software.</li> </ol>	

# CBSE SAMPLE PAPER 2021-22(TERM-2)

## MARKING SCHEME

### INFORMATICS PRACTICES (Code: 065)

Maximum Marks: 35

Time: 2 hours

#### General Instructions

- The question paper is divided into 3 sections – A, B and C
- Section A, consists of 7 questions (1-7). Each question carries 2 marks.
- Section B, consists of 3 questions (8-10). Each question carries 3 marks.
- Section C, consists of 3 questions( 11-13). Each question carries 4 marks.
- Internal choices have been given for question numbers – 1 , 3, 8 and 12.

Section –A									
Each question carries 2 marks									
Q. No	Part No.	Question	Marks						
1.		<p>Differentiation between static and dynamic web pages:</p> <table border="1"><thead><tr><th>Static Web page</th><th>Dynamic Web page</th></tr></thead><tbody><tr><td>1. Content of this type of webpage cannot be changed at run time.</td><td>1. Content of this type of webpage can be changed at run time.</td></tr><tr><td>2. No interaction with server's database is possible in case of static web pages.</td><td>3. Interaction with server's database is possible in case of dynamic web pages.</td></tr></tbody></table> <p><b>1 mark each for each correct differentiation mentioned above or any other relevant point of differentiation.</b></p> <p><b>OR</b></p> <p>The difference between a website and a web page is that a website is a collection of different web pages containing information on a particular topic. A web page is an individual page of a big website usually containing more specific information. If we compare a website with a book, then a webpage can be compared with a single page of that book.</p> <p><b>2 marks for correct answer</b></p>	Static Web page	Dynamic Web page	1. Content of this type of webpage cannot be changed at run time.	1. Content of this type of webpage can be changed at run time.	2. No interaction with server's database is possible in case of static web pages.	3. Interaction with server's database is possible in case of dynamic web pages.	(2)
Static Web page	Dynamic Web page								
1. Content of this type of webpage cannot be changed at run time.	1. Content of this type of webpage can be changed at run time.								
2. No interaction with server's database is possible in case of static web pages.	3. Interaction with server's database is possible in case of dynamic web pages.								

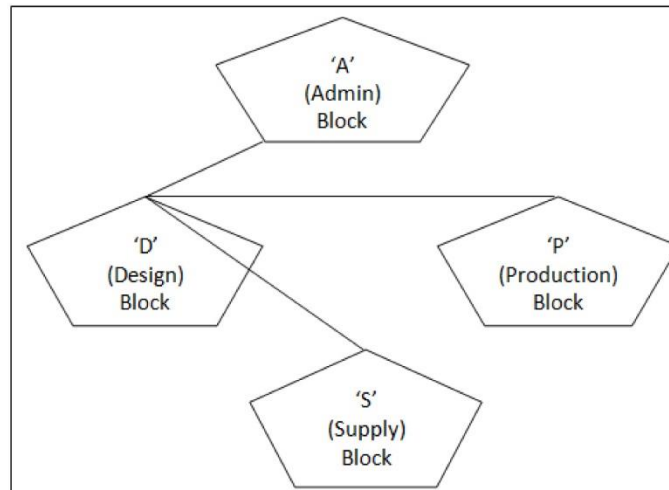
2.	(i)	Cookies  <b>1 mark for correct answer</b>	(1)
	(ii)	Name of any two popular web browsers: <ul style="list-style-type: none"> <li>• Mozilla firefox</li> <li>• Google Chrome</li> </ul> OR Any other correct name  <b>½ mark each for each correct browser name</b>	(1)
3.		Output: <b>i. 125</b> <b>ii. 2</b>  <b>1 Mark for each correct answer</b> <b>OR</b>  i. power(): It returns the value of a number raised to the power of another number. For example:  <b>Select power(5,3);</b> <b>Output: 125</b>  ii. mod(): It returns the remainder of a number divided by another number.  For example:  <b>Select mod(5,3);</b> <b>Output: 2</b>  <b>1 Mark for each correct answer</b>	(2)
4.		Role of web server in hosting a website:  A web server is the main centralized computer system that hosts and runs the websites. It has a computer program that distributes web pages as they are requisitioned. The basic role of the web server is to store, process and deliver the web pages to the users as and when required.  <b>2 Marks for correct answer</b>	(2)

5.	<p>Output:  <b>i) 8.720</b>  <b>ii) 10</b></p> <p><b>1 Mark for each correct answer</b></p>	(2)																																								
6.	<p>Having clause is used to further filter those groups of records which will be generated through group by clause.</p> <p>For example:</p> <p>Select max(marks) from student group by classes having classes in (10,12);</p> <p>Above given query will arrange records in groups according to the classes. Further filtering on these groups will happen through having clause, which will finally display the highest marks from classes 10 and 12.</p> <p><b>1 Mark for correct clause</b>  <b>1 Mark for correct example</b></p>	(2)																																								
7.	<p>Mr. Som, a HR Manager in a multinational company “Star-X world” has created the following table to store the records of employees:</p> <p><b>Table: Emp</b></p> <table border="1" data-bbox="408 1050 1195 1355"> <thead> <tr> <th>Eid</th> <th>EName</th> <th>Department</th> <th>DOB</th> <th>DOJ</th> </tr> </thead> <tbody> <tr> <td>Star1</td> <td>Ivan</td> <td>Sales</td> <td>1994-08-28</td> <td>2020-02-14</td> </tr> <tr> <td>Star2</td> <td>Melinda</td> <td>IT</td> <td>1997-10-15</td> <td>2021-11-19</td> </tr> <tr> <td>Star3</td> <td>Raj</td> <td>Accounts</td> <td>1998-10-02</td> <td>2019-04-02</td> </tr> <tr> <td>Star4</td> <td>Michael</td> <td>Sales</td> <td>2000-02-17</td> <td>2020-05-01</td> </tr> <tr> <td>Star5</td> <td>Sajal</td> <td>IT</td> <td>2001-12-05</td> <td>2018-06-13</td> </tr> <tr> <td>Star6</td> <td>John</td> <td>Accounts</td> <td>1995-01-03</td> <td>2019-07-15</td> </tr> <tr> <td>Star7</td> <td>Julia</td> <td>Sales</td> <td>1985-11-13</td> <td>2020-08-19</td> </tr> </tbody> </table> <p>Output:</p> <p><b>i) 2001</b>  <b>ii) Melinda</b></p> <p><b>1 Mark for each correct answer</b>  <b>OR</b></p> <p><b>Queries:</b></p>	Eid	EName	Department	DOB	DOJ	Star1	Ivan	Sales	1994-08-28	2020-02-14	Star2	Melinda	IT	1997-10-15	2021-11-19	Star3	Raj	Accounts	1998-10-02	2019-04-02	Star4	Michael	Sales	2000-02-17	2020-05-01	Star5	Sajal	IT	2001-12-05	2018-06-13	Star6	John	Accounts	1995-01-03	2019-07-15	Star7	Julia	Sales	1985-11-13	2020-08-19	(2)
Eid	EName	Department	DOB	DOJ																																						
Star1	Ivan	Sales	1994-08-28	2020-02-14																																						
Star2	Melinda	IT	1997-10-15	2021-11-19																																						
Star3	Raj	Accounts	1998-10-02	2019-04-02																																						
Star4	Michael	Sales	2000-02-17	2020-05-01																																						
Star5	Sajal	IT	2001-12-05	2018-06-13																																						
Star6	John	Accounts	1995-01-03	2019-07-15																																						
Star7	Julia	Sales	1985-11-13	2020-08-19																																						

	<p>i) select ENAME,min(year(DOB)) from emp;</p> <p>ii) select ENAME from emp where month(DOJ)=5;</p> <p><b>1 Mark for each correct answer</b></p>	
	<p><b>SECTION – B</b></p> <p><b>Each question carries 3 marks</b></p>	
8.	<p>Output:</p> <p>i. 11</p> <p>ii. cbse</p> <p>iii. exams</p> <p><b>1 Mark for each correct answer</b></p> <p style="text-align: center;"><b>OR</b></p> <p>i. right() select right(user_id,2) from hotel;</p> <p>ii. lower() select lower(name) from hotel;</p> <p>iii. mid()/substr()/substring() Select mid(city,3,3) from hotel;</p> <p><b>½ Mark for suggesting each correct function name</b></p> <p><b>½ Mark for writing each correct query</b></p>	(3)
9.	<p>i. It returns the current date and time.</p> <p>ii. None</p> <p>iii. The return type for NOW() function is either in 'YYYY-MM-DD HH:MM:SS' format or YYYYMMDDHHMMSS.uuuuuu format, depending on whether the function is used in a string or numeric context.</p> <p><b>1 Mark for each correct answer</b></p>	(3)
10.	<p>i. To remove leading space characters: ltrim()</p> <p>ii. To remove trailing space characters: rtrim()</p> <p>iii. To remove both type of space characters: trim()</p> <p><b>MySQL Queries:</b></p> <p>Select ltrim(' Hello ');</p> <p>Select rtrim(' Hello ');</p> <p>Select trim(' Hello ');</p> <p><b>Output:</b></p>	(3)

		Hello	
		<p>½ Mark for suggesting each correct function name</p> <p>½ Mark for writing each correct MySQL query</p>	
		<p><b>Section C</b></p> <p><b>Each question carries 4 marks</b></p>	
11.		<p>(a) select * from stock order by price desc;</p> <p>(b) select category, sum(qty) from stock group by category;</p> <p>(c) select category, avg(price) from stock group by category;</p> <p>(d) select category, max(price) from stock group by category;</p> <p><b>1 Mark for each correct query</b></p>	(4)
12.		<p><b>Output:</b></p> <p>(a) 193</p> <p>(b) 194</p> <p>(c) 93.75</p> <p>(d) 6</p> <p><b>1 Mark for each correct output</b></p> <p style="text-align: center;"><b>OR</b></p> <p>First query will produce the output 7.  <b>Justification:</b> count (*) will count and display total number of rows (irrespective of any null value present in any of the column).</p> <p>Second query will produce the output 6.  <b>Justification:</b> count (col_name) will count and display total number of not null values in the specified column.</p> <p><b>1 Mark each for each correct output</b>  <b>1 Mark each for each correct justification</b></p>	(4)
13.		<p>(a) LAN</p> <p>As computers are placed with-in the same campus with-in a small range.</p> <p>½ Mark for correct answer</p> <p>½ Mark for correct justification</p> <p>(b) Star topology</p> <p>½ Mark for correct answer</p>	(4)

**Cable Layout:**



**½ Mark for correct cable layout**

(c)

- i. Repeater should be placed in between Block 'D' (Design) and Block 'P' as distance is more.
- ii. Hub/Switch should be placed in each building to connect various computers together.

**½ Mark for each correct answer**

(d) Video Conferencing software: Teams, Zoom, Skype etc.  
(Any one)

Protocol of Video Conferencing software: VOIP

**½ Mark for each correct answer**



## CHAPTER-7

### PRACTICE PAPER-1(TERM-2) Informatics Practices (065) Class 12

Time: 02:00 Hrs

Marks: 35

#### Instructions:

1. There are 16 questions in the question booklet.
2. Each question is compulsory.
3. The Question paper is divided into four sections - Section A containing 05 questions each of 01 mark, Section B containing 05 questions each of 02 marks, Section C containing 04 questions each of 03 marks, Section D containing 02 questions each of 04 marks.
4. Options are available with the questions in Section D.

#### SECTION - A (01 MARK QUESTIONS)

QNo.	Question	Marks
1	Write the output of the following command?  <code>select round(123.789,-2);</code>  (a) 100 (b) 120 (c) 123.78 (d) 123.80	1
2	A website is a collection of  (a) Webpages (b) Webpages (c) Webservers (d) Hyperlinks	1
3	Which of the following network devices is also known as intelligent hub?  (a) Router (b) Gateway (c) Repeater (d) Switch	1
4	The protocols used to send and receive emails, respectively, are  (a) SMTP, MIME (b) SMTP, POP3 (c) POP3, SMTP (d) POP3, MIME	1

- 5 Which of the following SQL commands may output 24? 1
- (a) `select day(now());`  
 (b) `select now();`  
 (c) `select dayname(now());`  
 (d) `select month(now());`

**SECTION - B (02 MARK QUESTIONS)**

- 6 Consider the string "Class 12 CS". Write command to display: 2
- (a) the position of string "CS" in the string "Class 12 CS".  
 (b) Last six characters of the string "Class 12 CS".
- 7 Explain the difference between where and having clauses in SQL with the help of a suitable example. 2
- 8 Consider the below given Student table and answer the questions which follow: 2

roll	marks
1	20
2	30
NULL	19

- (a) What will be the output of  
`select sum(roll)+count(roll)+sum(marks)+count(marks) from student;`  
 (b) Write command to update marks equal to 0 where roll number is NULL.
- 9 Given a decimal number 1905.675, write commands in SQL to 2
- (a) round it off to the number 2000.  
 (b) round it off to 1 place after the decimal.
- 10 Anisha has been given the below given student table: 2

roll	marks	class
1	20	11
2	30	12
3	30	11
4	30	12

- (a) How will she generate the following output using group by and having statements?

class	sum(marks)
11	50

- (b) How will she update the student table to increase marks of all students

by 10% and obtain the following output?

roll	marks	class
1	22	11
2	33	12
3	33	11
4	33	12

SECTION - C (03 MARK QUESTIONS)

- 11 A Salesman relation is given below: 3

Scode	Sname	Address	Dojoin	Sales	Area
100	Amit	Delhi	2017/09/29	5000.90	East
101	Sushant	Gurgaon	2018/01/01	7000.75	East
102	Priya	Noida	2018/04/25	3450.45	West
103	Mohit	Delhi	2018/11/03	6000.50	North
104	Priyanshi	Delhi	2019/12/15	8000.62	North

- (a) Write SQL command to display the area-wise count of salesmen for those areas who have more than 1 salesman.  
 (b) Write SQL command to find the total Sales.  
 (c) Write SQL command to display the Sname and Dojoin of the salesman who has joined most recently.

- 12 How are aggregate functions different from other SQL functions? Ishita is trying to find the max sales out of all the sales corresponding to Salesmen having Delhi as address in the Salesman table given in Q11. Write two different SQL queries (using group by and without using group by) to perform this task. 3

- 13 Predict the output of below given SQL queries 3
- select length(ltrim(" ABCD EFGH "));
  - select length(trim(" ABCD EFGH "));
  - select power(instr(lower('A@123'),'2'),instr(lower('A@123'),'3'));

- 14 Differentiate between the following 3
- static and dynamic web page
  - website and webpage

SECTION - D (04 MARK QUESTIONS)

- 15 Write the SQL commands which will perform the following operations? 4
- To display the starting position of your last name (lname) from the whole name (name).
  - To display dayname, month name and year from today's date.
  - To display the remainder on dividing 3 raised to power 5 by 5.
  - To display 'I am here' in lower as well as uppercase.

OR

Consider the table Salesman with the given data

Score	Sname	Address	Dojoin	Sales	Area
100	Amit	Delhi	2017/09/29	5000.90	East
101	Sushant	Gurgaon	2018/01/01	7000.75	East
102	Priya	Noida	2018/04/25	3450.45	West
103	Mohit	Delhi	2018/11/03	6000.50	North
104	Priyanshi	Delhi	2019/12/15	8000.62	North

Write SQL queries using function to perform the following operation:

- Display Score and Sales after rounding off the Sales to 1 decimal place.
- Display the dayname from Dojoin of Salesman.
- Display the position of occurrence of "a" in the Sname.
- Display three characters from Sname starting from the second character for those salesmen whose name ends with 't'.

- 16 Indian School, in Mumbai is starting up the network between its different wings. There are four Buildings named as SENIOR, JUNIOR, ADMIN and HOSTEL. The distance between various buildings is as follows:

4

ADMIN TO SENIOR	200m
ADMIN TO JUNIOR	150m
ADMIN TO HOSTEL	50m
SENIOR TO JUNIOR	250m
SENIOR TO HOSTEL	350m
JUNIOR TO HOSTEL	350m

The number of computers is as follow:

SENIOR	130
JUNIOR	80
ADMIN	160
HOSTEL	50

- Suggest the cable layout of connections between the buildings.
- Suggest the most suitable place (i.e., building) to house the server of this school, provide a suitable reason.
- Suggest the placement of the following devices with justification.

Repeater, Hub/Switch

- The organisation also has inquiry office in another city about 100 kms away in hilly region. Suggest the suitable transmission media to interconnect to school and inquiry office out of the following :

Fiber optic cable, Microwave, Radiowave

OR

Trine Tech Corporation (TTC) is a professional consultancy company. The company is planning to set up their new offices in India with its hub at Hyderabad. As a network adviser, you have to understand their requirements and suggest them the best available solutions. Their queries are mentioned as (a) to (d) below. TTC is having three blocks, namely Human Resource Block, Conference Block and Finance Block.

Distance between blocks:

Block (From)	Block (To)	Distance
Human Resource	Conference	110

Human Resource	Finance	40
----------------	---------	----

Conference	Finance	80
------------	---------	----

Also, the number of computers to be installed in each block are:

Block	Computers
-------	-----------

Human Resource	25
----------------	----

Finance	120
---------	-----

Conference	90
------------	----

- What will be the most appropriate block, where TTC should plan to install their server?
- Draw a block to cable layout to connect all the buildings in the most appropriate manner for efficient communication.
- What will be the best possible connectivity out of the following, you will suggest to connect the new setup of offices in Bangalore with its London based office: Satellite Link, Infrared, Ethernet Cable
- Which of the following device will be suggested by you to connect each computer in each of the buildings: Switch, Modem, Gateway

**PRACTICE PAPER – 2 (TERM-2)**  
**2022**  
**Informatics Practices (065)**  
**Class 12**

**Time: 02:00 Hrs**

**Marks: 35**

**Instructions:**

1. There are 16 questions in the question booklet.
2. Each question is compulsory.
3. The Question paper is divided into four sections - Section A containing 05 questions each of 01 mark, Section B containing 05 questions each of 02 marks, Section C containing 04 questions each of 03 marks, Section D containing 02 questions each of 04 marks.
4. Options are available with the questions in Section D.

**SECTION - A (01 MARK QUESTIONS)**

QNo.	Question	Marks
1	Write the output of the following command?  <code>select truncate(123.789,-2);</code>  (a) 120 (b) 130 (c) 123.78 (d) 100	1
2	Which of the following communication mediums will offer the highest bandwidth? (a) Optical Fibre (b) Shielded Twisted Pair (c) Unshielded Twisted Pair (d) Coaxial cable	1
3	For n devices in a network, what is the number of cable links required for a mesh topology? (a) $n^2$ (b) $n*(n-1)$ (c) $(n-1)/2$ (d) $n*(n-1)/2$	1
4	Which of the following protocols is used in real time internet based communication? (a) VoIP (b) SMTP (c) POP3 (d) MIME	1

- 5 If on '1990-01-22', it was Monday, what will be the output of following SQL command? 1
- ```
select dayname('1990-01-22')+1;
```
- (a) Error  
(b) 1  
(c) 7  
(d) Monday

**SECTION - B (02 MARK QUESTIONS)**

- 6 Consider the string "PYTHON LANGUAGE". Write command to display: 2
- (a) the length of the string after trimming spaces from the beginning and end.  
(b) Position of string "LA" after trimming only beginning spaces from the string "PYTHON LANGUAGE".
- 7 Given a table Orders (oid, cuid, item), Radhika applies the following command to find cuid of those customers who have two or more than two orders. 2
- ```
select cuid,count(*) from orders where count(*)>=2;
```
- However, the code gives an error. Explain the reason and write correct code to achieve the desired task.
- 8 Akash writes the following commands for a student table having attributes roll, name, age and class. 2
- Command1: select count(\*) from student  
Command2: select count(age) from student.
- He gets the output 10 for the first command but gets an output 8 for the second command. Explain the reason behind this difference.
- 9 Given a number n, write commands in SQL to 2
- (a) compute cube of this number using SQL function.  
(b) compute remainder on division of n by another number m using SQL function.
- 10 Anita has been given the below given orders table: 2

oid	cuid	item
1001	101	Fan
1002	101	Pen
1003	102	Book
1004	103	Pencil
1005	104	Pen
1006	104	Fan

(a) How will she generate the following output using group by and aggregate functions wherein the count of items for cuid are arranged in descending order?

cuid	count(*)
101	2
104	2
102	1
103	1

(b) How will she count the number of distinct items in the orders table?

### SECTION - C (03 MARK QUESTIONS)

11 A student relation is given below: 3

RollNo	Name	Class	DOB	Gender	City	Marks
1	Anand	XI	6/6/97	M	Agra	430
2	Chetan	XII	7/5/94	M	Mumbai	460
3	Geet	XI	6/5/97	F	Agra	470
4	Preeti	XII	8/8/95	F	Mumbai	492
5	Saniyal	XII	8/10/95	M	Delhi	360
6	Maakhiy	XI	12/12/94	F	Dubai	256
7	Neha	X	8/12/95	F	Moscow	324

(a) Write SQL command to display the class-wise count of students for those classes who have more than 2 students.

(b) Write an SQL command to find the average marks for class XI and class XII students.

(c) Write an SQL command to display the name and DOB of the youngest student.

12 Give suitable examples to explain the role of % and \_ characters for pattern matching in SQL. 3

13 Predict the output of below given SQL queries 3

- select power(instr('abcd412','1'),3);
- select substr(lower('ABC 123'),1,3)
- select power(instr(upper('A@123'),'1'),instr(upper('A@123'),'2'));

14 Differentiate between the following 3

- LAN and WAN
- SMTP and POP3

### SECTION - D (04 MARK QUESTIONS)



- 15 Write the SQL commands which will perform the following operations? 4
- To display the position of space character in your name (myname).
  - To display day, month and year from today's date.
  - To compute 5 raised to the power remainder on dividing 15 by 4.

To display the leftmost as well as the rightmost character of the string 'PYTHON'.

OR

Consider the table Salesman with the given data

Score	Sname	Address	Dojoin	Sales	Area
100	Amit	Delhi	2017/09/29	5000.90	East
101	Sushant	Gurgaon	2018/01/01	7000.75	East
102	Priya	Noida	2018/04/25	3450.45	West
103	Mohit	Delhi	2018/11/03	6000.50	North
104	Priyanshi	Delhi	2019/12/15	8000.62	North

Write SQL queries using function to perform the following operation:

- Display maximum sales for each area.
  - Display the month name from Dojoin of Salesman.
  - Display those addresses which anywhere contain 'i'.
  - Display two characters from Sname starting from the first character for those salesmen who belong to Delhi.
- 16 ABC is an online corporate training provider company for IT related courses. 4  
The company is setting up their new campus in Kolkata. You as a network expert have to study the physical locations of various blocks and the number of computers to be installed. In the planning phase, provide the best possible answers for the queries (i) to (iv) raised by them.

Distance between blocks:

Block (From)	Block (To)	Distance
Administrative	Finance	60
Administrative	Faculty studio	120
Finance	Faculty studio	70

Also, the number of computers to be installed in each block are:

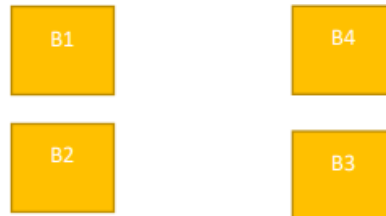
Block	Computers
Administrative	20
Finance	40
Faculty studio	120

- Suggest the most appropriate block, where ABC should plan to install the server.
- Suggest the most appropriate block to block cable layout to connect all three blocks for efficient communication.
- Which type of network out of the following is formed by connecting the computers of these three blocks? LAN, MAN, WAN

- d. Which wireless channel out of the following should be opted by ABC to connect to students from all over the world? Infrared, Microwave, Satellite.

OR

A company XYZ Enterprises has four blocks of buildings as shown:



Center to center distance between various blocks

B3 TO B1	40 M
B1 TO B2	50 M
B2 TO B4	15 M
B4 TO B3	150 M
B3 TO B2	115 M
B1 TO B4	90 M

Number of computers in each block :

B1	140
B2	20
B3	18
B4	30

Computers in each block are networked but blocks are not networked. The company has now decided to connect the blocks also

- Suggest the most appropriate topology for the connections between the blocks.
- The company wants internet accessibility in all the blocks. The suitable and cost-effective technology for that would be .
- Which device will you suggest for connecting all the computers within each of their blocks?
- The company is planning to link its head office situated in New Delhi with the offices in hilly areas. Suggest a way to connect it economically:

# **BIBLIOGRAPHY**

This Students Support Material prepared with reference of following sources:

1. NCERT Text Book, Informatics Practices, Class XII
2. Arihant CBSE TERM-2(2022), Informatics Practices, Class XII
3. Student Support Material, KVS Raipur Region
4. Teachers WhatsApp group.