Chapter 1
Review of C++ Programming

What is a character set?

- A set of valid symbols that a programming language can recognize is called as character set. These are the fundamental units of the language.
- It contains:

1) **Letters :** A to Z, a to z
2) **Digits :** 0 to 9
3) **Special Characters :** , . ; : > < =
4) **White Space :** blank space, tab, form feed, new line, enter etc...
5) **Other characters :** C++ can process any of the 256 ASCII characters.

What are tokens?

- Tokens are the basic building blocks of a C++ program.

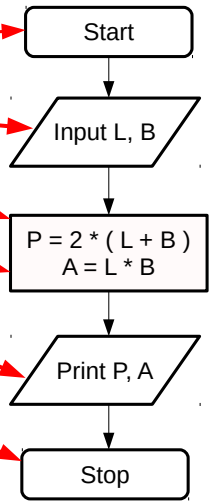
1) **Keywords**: Keywords are tokens that carry a specific meaning to the language compiler. Eg. int, switch etc..
2) **Identifiers**: Identifiers are user defined words that are used to name different program elements such as memory locations, statements, functions, classes etc.
3) **Literal** : Literals are data items that never change their values during the program running. They are also known as constants. There are 4 types of literals: Integer Literal, Floating Point Literal, Character Literal 'b', String Literal
4) **Punctuators**: Special symbols that have syntactic or semantic meaning to the compiler. Eg: #,:,',",() ,[]
5) **Operators**: Operators are the tokens that trigger some kind of operations. The operations applied on a set of data called operands. Eg: +, - , * , /

- **Eg : Algorithm and Flowchart to find the area and perimeter of a rectangle**

Algorithm

STEP 1 : START
STEP 2 : Input L, B
STEP 3 : P = 2 * (L + B)
STEP 4 : A = L * B
STEP 5 : Print P, A
STEP 6 : Stop

Flowchart



C++ program to find area and perimeter of a rectangle

```
#include<iostream>
using namespace std;

int main()
{
    float l,b,area,perimeter;

    cout<<"Enter Length and Breadth of the Rectangle \n";
    cin>>l>>b;

    perimeter=2*(l+b);
    area=l*b;

    cout<<"Perimeter : "<<perimeter;
    cout<<" Area : "<<area;

    return 0;

}
```

Structure of a C++ Program

Q1: Write a C++ Program to find sum of two numbers

```
#include<iostream>
using namespace std;

int main()
{
    float a,b,sum;

    cout<<"Enter two numbers";
    cin>>a>>b;
    sum=a+b;
    cout<<sum;
    return 0;
}
```

Write a C++ program to find the best CE score from the three given scores

```
#include<iostream>
using namespace std;
int main()
{
    int m1,m2,m3;
    cout<<"Enter three Marks";
    cin>>m1>>m2>>m3;

    if(m1>m2 && m1>m3)
    {
        cout<<m1<<" is the highest";
    }
    else if(m2>m3)
    {
        cout<<m2<<" is the highest";
    }
    else
    {
        cout<<m3<<" is the highest";
    }

    return 0;
}
```

What are rules in naming of identifiers?

1) It is an arbitrary long sequence of letters, digits and underscores(_)
2) The first letter must be an alphabet or underscore
3) White space and special characters are not allowed.
4) Keywords cannot be used as identifiers.
5) Upper and lower case letters are treated differently

What are Statements in a C++ Program?

Statements are fragments of C++ program that are executed in sequence

- There are four kinds of statements in C++ program. They are:

1) **Declaration statement**: Used to declare identifiers before their usage. Eg: int a, b, sum; Values can be provided to the variables along with the declaration. This kind of statement is known as variable initialisation statement. Eg: float pi = 3.14;

2) **Output statement**: Used to perform output operation. Eg: cout<<“Hello world”; Here cout is a pre-defined identifier and << is an insertion operator or put to operator.

3) **Assignment statement**: Used to store a data in a memory location. Eg: n=253; Here = is called Assignment operator.

4) **Input statement**: Used to perform input operation. Eg: cin >> a >> b; Here cin is a predefined identifier and >> is an extraction operator or get from operator.

Arithmetic Assignment Operators

- A simple arithmetic statement can be expressed in a more condensed form using arithmetic assignment operators.
- For example, a=a+10 can be represented as a+=10.
- Here += is an arithmetic assignment operator.
- The arithmetic assignment operators in C++ are +=, -=, *=, /=, %=

What is Increment Operator ?

- The increment operator is represented by ++ symbol.
- It is a unary operator.
- It adds 1 to the content of the operand variable and the result is stored in it.
- There are two forms of increment operator;

1) **Prefix form (change and use method.):** In Prefix form, the value of the variable in increased by 1 immediately. Eg: ++a

2) **Postfix form (use and change method.) :** In Postfix form, the value of the variable is increased only in the next statement. Eg: a++

What is Decrement Operator ?

- The decrement operator is represented by -- symbol.
- It is a unary operator.
- It subtracts 1 from the content of the operand variable and the result is stored in it
- There are two forms of decrement operator;

1) **Prefix form** In Prefix form, the value of the variable in decreased by 1 immediately

2) **Postfix form** In Postfix form, the value of the variable is decreased only in the next statement.

Cascading

- The input, output and assignment operators (>>, << and =) may appear more than once in the respective statements. It is known as cascading.
- Eg:
- cin >> a >> b >> c;
- cout << "Sum of " << n << "numbers = " << sum;
- a = b = c;

What is Data Type ?

- Data types are the means to identify the nature of the data and the set of operations that can be performed on the data

What are different data types in C++?

- a). **Fundamental data type (built in Data types)**: They are defined in the C++ compiler. They can not be further broken down.
- 1). char: They are symbols covered by the character set of C++ language. It uses only one byte of memory (storing in memory with its ASCII value).
- 2). int : Whole numbers without fractional part. It can be positive or negative, or zero. It uses Four bytes of memory based on GCC compiler.
- 3). float : They are numbers with fractional part. It uses four bytes of memory. It can be represented either by scientific notation or mantissa exponential method.
- 4). double: It is used for handling large floating point numbers. It uses Eight bytes of memory.
- 5). void : uses zero bytes of memory.
- b). **Derived data types**: They are derived from fundamental data types by some grouping or alteration in size. Eg. Array, pointer etc...
- c). **User defined data types:** The programmer can define there own data types. Eg. Struct, enum, union, class etc..

What are type modifiers?

- Type modifiers are used to modify the size of memory space and range of data supported by the basic data types.
- Eg. long, short, signed, unsigned

What are expressions?

- Expressions are constituted by operators and operands to perform an operation. Based on the operators used, there are different types of expressions like ,
- i). **Arithmetic expressions**: An expression in which only arithmetic operators are used is called arithmetic expression.

  a). **Integer expression** :All operands in the expressions are integers. An integer expression yields an integer result.
  Eg: int a=3,b=2,c;
  c=a+b;

  b). **Floating point (decimal) expression**: All operands in the expression are floating points(decimals).A floating point expression yields a floating point result. Eg: Eg: float a=2.5,b=3.2,c;
  c=a+b
- ii). **Relational expression** : Relational operators are used. It consists of numeric or character data as operands and they return true or false as outputs. Eg: a>b
- iii). **Logical expression** : It uses relational expressions as operands and return true or false as results. Eg: a>b && a>c

What is type conversion?

- Type conversion means converting one data type to another data type.
- There are two types of type conversion:

1)**Implicit type conversion (Type Promotion)**: also known as automatic type conversion is performed by the compiler. The conversion is always from lower type to higher type.
Eg: 6+2.5=8.5

2)**Explicit type conversion (Type casting)**: refers to conversion that is performed explicitly using cast operator. The operator used for this purpose is known as cast operator. The cast operator takes on the format cast type (expression)

- eg int a = (int) 10.5 , Here the value 10.5 is converted to integer type

What are Control Statement?

- Control Statements are used for altering the normal flow of program execution.
- Control statements are classified into two:
- **(i) decision making/selection statements**
- **(ii) iteration/Looping statements.**

END

What is Decision Making / Selection Statements?

- Decision Making statements or Selection statements are used for selected execution of statements of the program.
- Eg:

1)if

2)Switch

3) Conditional Operator

END

Entry controlled loop and Exit Controlled Loop

- Looping statements, also called iteration statements, are classified into two:

1) **entry- controlled**

2) **exit-controlled**

- **Entry Controlled Loops**: test expression(condition) is evaluated before the execution of the loop-body. Loop body is executed only if the condition is true. Eg: while, for .
- **Exit Controlled Loops**: test expression (condition) is checked after executing the loop- body. loop-body will be executed at least once Eg: do while

END

What are Iteration Statements or Looping Statements

- The statement that execute one or more statements repeatedly several number of times is called as Looping Statements.
- C++ provides three looping statements:

1) **while**

2) **for**

3) **do-while.**

Compare Entry Controlled Loop and Exit Controlled Loop

Entry controlled loop	Exit controlled loop
• Condition is checked before the execution of the body	• Condition is checked after the execution of the body
• Body may never be executed.	• Body will surely be executed at least once.
• Suitable when skipping of the body from being executed is required	• Suitable when normal execution of the body is to be ensured.

Table 3.1 : Comparison of loops

What are the components of Looping Statement?

- A looping statement has four components:

1) **initialisation expression:** sets the initial value of loop control variable

2) **test expression:** Condition that is checked for execution of loop

3) **update expression:** changes the value of the loop control variable.

4) **Loop-body:** set of statements for repeated execution.

What are Jump Statements?

- Jump statements are used to jump unconditionally to a different statement. It is used to alter the flow of control unconditionally.
- There are four types of jump statements in C++

a) **Break**: It is used to terminate a loop or a switch statement.

b) **Continue**: It is used for skipping over a part of the code within the loop-body and forcing the next iteration.

c) **Goto**: It can transfer the program control to anywhere in the function. The target destination of a goto statement is marked by a label, which is an identifier.

d) **Return**: It changes the control from a function to its parent program.

Compare break and continue statements

Break	Continue
Used with Loops and Switch	Used only with loops
Takes the control outside the loop by skipping the remaining part of the body	Takes the control to the beginning of the loop by skipping the remaining part of the body
Control may exit the loop, even when test expression is true.	Control exits the loop, only when the test expression returns false

Previous Questions

- 1. Which among the following is an insertion operator ?
  (a) << (b) >> (c) < (d) >
- 2.What are the main components of a looping statement ?
- 3. How do continue and break statement differ in a loop ?
- 4. …… is an exit control loop.
  a)for loop b)while loop c)do …while loop d)break
- 5.Explain switch statement with an example.
- 6.Compare continue and break statement ?

- 7. Compare the selection statements ‘if’ and switch
- 8. Define Jump statements. Explain any two.
- 9. Explain about nested loops
- 10. The input operator in C++ is .....
- 11. List the type modifiers in C++
- 12. _____ operator is the arithmetic assignment operator.
- 13. Identify the following C++ tokens
  (a) “Morning” (b) float (c) > (d) student
- 14. What is looping statements in C++ ?
- 15. Explain different looping statements
- 16. Write an example for entry controlled loop in C++
- 17. _____ statement is used to skip the current iteration of a loop. (Break, Continue, Go to)
- 18. Explain any three data types in C++
- 19 List and explain any three types of statements in C++.
- 20. List and explain any three types of statements in C++.

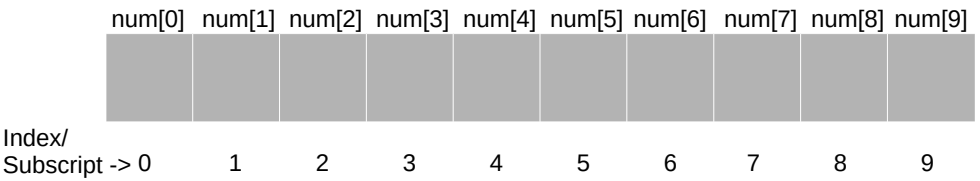
Chapter 2
Arrays

What is an array?

- An array is a collection of elements of the same type placed in contiguous memory locations.
- Arrays are used to store a set of values of the same type under a single variable name.
- Each element in an array can be accessed using its position in the list, called **index number or subscript**.
- Eg: int num[10];

Array Declaration

int num[10];



How to declare an array (array declaration)?

- Syntax:
  data_type array_name[size];
- **data_type** is the type of data that the array variable can store
- **array_name** is an identifier for naming the array and the size is a positive integer number that specifies the number of elements in the array.
- Eg: int num[10];

- 1) How to declare integer array?
- int num[10];
- 2) How to declare float array?
- float num[10];
- 3) How to declare character array?
- char name[10];

Array Initialization

int num[10]={ 2, 3, 5, 7, 11, 13, 17, 19, 23, 29};

num[0]	num[1]	num[2]	num[3]	num[4]	num[5]	num[6]	num[7]	num[8]	num[9]
2	3	5	7	11	13	17	19	23	29

cout<<num[6];
cout<<num[0]
cout<<num[6]+num[0];

OUTPUT

17
2
19

What is array initialisation?

- Giving values to the array elements at the time of array declaration is known as **array initialisation.**
- Eg:
- int score[5] = {98, 87, 92, 79, 85};
- char code[6] = {‘s’, ‘a’, ‘m’, ‘p’, ‘l’, ‘e’};
- float wgpa[7] = {9.60, 6.43, 8.50, 8.65, 5.89, 7.56, 8.22};

- Q1) How we can initialize an integer array ?Give an example.
- int score[5] = {98, 87, 92, 79, 85};
- Q2) How we can initialize a character array ?Give an example.
- char code[6] = {‘s’, ‘a’, ‘m’, ‘p’, ‘l’, ‘e’};
- Q3) How we can initialize a float array ?Give an example.
- float wgpa[7] = {9.60, 6.43, 8.50, 8.65, 5.89, 7.56, 8.22};

Memory Allocation for Arrays

Name	Description	Size
char	Character	1 byte
int	Integer	4 bytes
float	Floating point number	4 bytes
double	Double precision floating point number	8 bytes
void	Null data	Empty set

Data Type and its size

- The memory space allocated for an array can be computed using the following formula:

total_bytes = sizeof(array_type) × size_of_array

Eg: float a[10];

total_bytes = 4 x 10
= 40 bytes

- Q1) Find out the space allotted for char name[5]
- total_bytes= 1 x 5 =5 bytes
- Q2) Find out the space allotted for int num[10]
- total_bytes= 4 x 10 = 40 bytes
- Q3) Find out the space allotted for double num[10]
- total_bytes= 8 x 10 = 80 bytes

Accessing elements of arrays

- The process of accessing each element of an array is called **Array Traversal**.
- Any element can be accessed by giving the array's name and the element's position. This position is called the **index or subscript value**.

Write a C++ Program to display the contents of an array

```
#include<iostream>
using namespace std;
int main()
{
    int score[5] = { 98, 87, 92, 79, 85 };
    cout<<"The contents of the array are";
    for (int i=0; i<5 ;i++)
    {
        cout<< score[i];
        cout<<"\n";
    }
    return 0;

}
```

String handling using arrays

- A character array can be used to store a string.
- A string is an array or sequence of characters enclosed by a pair of double quotes. Eg: “hello”
- Null character \0 is stored at the end of a string

```
#include <iostream>
#include <cstdio>
using namespace std;
int main()
{
    char my_name[20];
    cout << "Enter your name: ";
    gets(my_name);
    cout << "Hello " << my_name;
    return 0;
}
```

Disadvantage of using cin

If we try to enter a name like “**Sachin Tendulkar**”, only the name Sachin will be saved.

To overcome this problem, we use **gets()**

gets() function

- gets() function is used to accept a string of characters including whitespace from a standard input device(eg. Keyboard) and store it in a character array.
- **cstdio** header file is required.
- Syntax:
  gets(String_data)
- Eg:

  gets(str);

puts() function

- puts() function is used to display a string data on a standard output device(eg. Monitor)
- **cstdio** header file is required.
- **Syntax:**
  puts(String_data)
- **Eg:**
  puts(“ Hello “);

Previous Questions

- Q1) An array element is accessed using _____.
- Index value or Subscript value
- Q2) Printing all the elements of an array is an example for _____ operation.
- Array traversal
- Q3) A string can be considered as an array of ------.
- Characters.
- Q4) A ---------- is stored at the end of the string.
- null character '\0'
- Q5) Which header file in C++ is need for gets() and puts() function?
- cstdio

Previous Questions

- Q6) Define an array.Give an example of an integer array declaration.
- Q7) Consider the following C++ code
  char text[20];
  cin»text;
  cout«text;
  If the input string is “Computer Programming”; what will be the output ? justify your answer.
- Computer

Previous Questions

- Q8) What is the differences in string handling using cin and gets() in C++ programs?
- cin cant read white space. gets() can read white space.
- Q9) i) Write C++ statement to declare a character array of size 20
- char text[20];
- ii) Write C++ statement to store the string “welcome” in the same array
- char text[20]=”welcome”;
- Q10) Initialize an integer array with 5 elements
- int num[5]={2,3,5,7,11};
- Q11) Write a program in C++ to accept a string with white space like “good morning” from the keyboard and display the same string

Chapter 3
Functions

What is Modular Programming?

- The process of breaking large program into smaller sub-programs is called as **modular programming or modularization**.
- C++ use **functions** to implement modular programming

What are the merits and demerits of modular programming?

- **Merits of modular programming:**
- a). Reduces the size of the program
- b). Less chance of error occurrence
- c). Reduces programming complexity
- d). Improves reusability
- **Demerits of modular programming:**
- a). Proper breaking down of the problem is a challenging task.
- b). Each sub problem must be independent of others. Careful about order of execution

What is a Function?

- Function is a named unit of statements in a program to perform a specific task as part of the solution.
- There are two types of functions in C++:
- a). **Predefined functions or Built in Functions** : Functions that are already written , compiled and their definitions are grouped and stored in header files.
  Eg. sqrt(), toupper()
- b). **User Defined Functions**: Functions that are written by the user to carry on some task.
  Eg. main( )

Predefined functions or Built in Functions

- Predefined functions or Built in Functions are classified into:

1) **Console functions for character I/O**
2) **Stream functions for I/O operations**
3) **String functions**
4) **Mathematical functions**
5) **Character functions**

What is Console function?

- Console functions allows to input and output character data. **cstdio** header file required

1) **getchar()** : This function returns the character that is input through the keyboard. Eg: char ch = getchar();
2) **putchar()** : This function displays the character given as the argument on the standard output unit (monitor).

```
char ch = 'B';
putchar(ch);
putchar( 97 );
```

Output

```
B
a
```

What is Stream functions?

- Stream Functions is used to perform input/output operations on character and strings.
- It allow a stream of bytes (data) to flow between memory and objects like Keyboard or Monitor. **iostream** header file required.

i. **get()** : It can accept a single character or multiple characters (string) through the keyboard. Eg cin.get(str,10)

ii. **getline()** : It accepts a string through the keyboard. Eg cin.getline(str,len);

iii **put()** : It is used to display a character constant or the content of a character variable given as argument. Eg. cout.put('B');

iv **write()** : This function displays the string contained in the argument. Eg. cout.write(str,10);

What is String Function?

- String functions allow manipulation of strings.
- **cstring** header file required.

i. **strlen()** : used to find the length of a string(Number of characters). Its return value is an integer.

ii. **strcpy()** : used to copy one string into another. The function will copy string2 to string1.
Syntax : strcpy(string1, string2);

iii **strcat()** : used to append one string to another string.
Syntax: strcat(string1, string2);

iv **strcmp()** : used to compare two strings. In this comparison, the alphabetical order of characters in the strings is considered. Syntax: strcmp(string1, string2);

Its return value is:
0 if string1 and string2 are same.
–ve value if string1 is alphabetically lower than string2
+ve value if string1 is alphabetically higher than string2

v. **strcmpi()**:used to compare two strings ignoring cases (both the upper case and lower case letters are treated as same). syntax is same as strcmp.

strlen() Example

- char str[10] = "Welcome";
- int n = strlen("Computer");
- cout<<n;
- cout<<"\n"
- cout<<strlen(str);

- Output:
- 8
- 7

strcpy() Example

- char s1[10], s2[10] = "Welcome";
- strcpy(s1,s2);
- cout << s1;

- Output:
- Welcome

strcat() Example

- char s1[20] = "Welcome", s2[10] = " to C++";
- strcat(s1,s2);
- cout << s1;

- Output:
- Welcome to C++

strcmp() Example

- char s1[]="Deepthi", s2[]="Divya";
- int n;
- n = strcmp(s1,s2);
- cout<<n;

strcmpi() Example

- char s1[]="SANIL", s2[]="sanil";
- int n;
- n = strcmpi(s1,s2);
- cout<<n;

What is Mathematical Function?

- Mathematical functions are used to perform mathematical operations.
- These functions require the inclusion of header file cmath

1) **abs()** : It is used to find the absolute value of an integer. It takes an integer as the argument (+ve or –ve) and returns the absolute value.

2) **fabs()** : it is used to find the absolute value of a floating point number. It will return the floating point value.

3) **sqrt()** : It is used to find the square root of a number.The function returns the non-negative square root of the argument.

4) **pow()** : This function is used to find the power of a number. It takes two arguments, the number and power value

What is Character Function?

- These functions are used to perform various operations on characters.
- These functions require the inclusion of header file cctype

1) **isupper()** : This function is used to check whether a character is in upper case(capital letter) or not. The function returns 1 if the given character is in uppercase, and 0 otherwise.

2) **islower()** : This function is used to check whether a character is in lower case (small letter) or not. The function returns 1 if the given character is lower case, and 0 otherwise.

3) **isalpha()** : This function is used to check whether the given character is an alphabet or not. The function returns 1 if the given character is an alphabet, and 0 otherwise.

4) **isdigit()** : This function is used to check whether the given character is a digit or not. The function Output: 1 returns 1 if the given character is a digit, and 0 otherwise.

5) **isalnum()** : This function is used to check whether a character is alphanumeric or not. The function returns 1 if the given character is alphanumeric, and 0 otherwise.

6) **toupper()** : This function is used to convert the given character into its uppercase. The function returns the upper case of the given character. If the given character is in upper case, the output will be the same.

7) **tolower()** : This function is used to convert the given character into its lower case. The function returns the lower case of the given character. If the given character is in lowercase, the output will be the same.

What is user defined function?

- A user defined function is a group of code to perform a specific task.
- Syntax:

```
data_type function_name(argument_list)
{
    statements ;
}
```

FUNCTION HEADER

FUNCTION BODY

- The result of a function is called **return value**.
- A set of values passed to a function is called **arguments**.

Compare Call by Value and Call by Reference or What are function calls?

Call by Value Method	Call by Reference Method
Ordinary variables are used as formal parameters.	Reference variables are used as formal parameters.
Actual parameters may be constants, variables or expressions.	Actual parameters will be variables only.
The changes made in the formal arguments do not reflect in actual arguments.	The changes made in the formal arguments do reflect in actual arguments.
Exclusive memory allocation is required for the formal arguments.	Memory of actual arguments is shared by formal arguments.

- **1) What are actual parameters?**
- The arguments given at the calling of a function is called actual (original) arguments or **actual parameters** since they are the actual data passed to the function for processing.
- **2) What are formal parameters?**
- The arguments used in the function definition are known as **formal parameter**.
- **3) What is default arguments?**
- Default arguments are arguments to which initial values given at function definition. So a function can be invoked without specifying all its arguments.

- **3) What is mean by scope or life time of a function/ variable?**
- Scope of a variable or function is that part of the program in which it is used. The life of a variable, declared within a function, ends with the execution of the last instruction of the function because its memory location of all the variables declared within it will be freed.
- **4) What is a local variable?**
- A variable declared within a function or a block of statements. It is available only within that function or block.

- **5) What is global variable? How can we make a variable as global?**
- If a variable is declared before the main() function then it can be used at any place in the program. This scope is known as global scope.
- **6) How a local function differs from a global function?**
- A function which is declared inside the function body of another function is called a **local function**
- A function declared outside the function body of any other function is called a **global function** and its scope is the entire program

Previous Questions

- **Q1)** Name the mathematical function which returns the absolute value of an integer number
- abs()
- **Q2)** Explain any two built-in functions in C++ that are used for string manipulation
- **Q3)** Define built-in functions. Give two examples?
- **Q4)** The process of breaking large program into smaller sub-programs is called.....
- Modularization
- **Q5)** Define modular programming.
- **Q6)** Explain the merits of modular programming

Previous Questions

- **Q7)** Identify the built in C++ functions for the following cases
- i) to convert -25 to 25
- abs()
- ii) compare ‘computer’ and “COMPUTER” ignoring cases
- strcmpi()
- iii) to check the given character is digit or not
- isdigit()
- iv) to convert the character ‘B’ to ‘b’
- tolower()
- v) to find square root of 64 or a number
- sqrt()

- **Q8)** Explain any three stream functions for I/O operation.
- **Q9)** ..... Function is used to check whether a character is alphanumeric.

  (a) isdigit( ) (b) isalnum( ) (c) isupper( ) (d) islower( )
- **Q10)** .Explain any three string function with example
- **Q11)** Consider the following code :

  char s1[ ]=”program”
  char s2[ ]=”PROGRAM”
  int n;
  n=strcmpi(S1,S2)
  What is the value of n ?
  (a) n=0 (b) n=1 (c) n>1 (d) n< 0

Q12) Compare call-by-value and call-by-reference methods for calling functions

Chapter 4
Web Technology

What is Web Page?

- Web page is a document on the web that can be viewed in a web browser
- Web pages are developed using **HTML**(Hyper Text Markup Language). It is called language of the internet.

Communication on the Web

- Communication on the internet can be classified into two.
- i) **Client to Server communication** - Here a user request service from a server and the server returns back the service to the client.
- ii) **Server to Server communication** - Server to Server communication takes place in e-commerce. In such communication confidential informations are send and received between different servers with the consent of client.

- **What is the role of payment gateway in online purchases?**

  Payment gateway is a server that acts as a bridge between merchant server and bank server and transfers money in an encrypted format whenever an online payment/money transfer is made. Eg:CCAvenue, Paytm, Google Pay

What is TCP / IP

- TCP / IP stands for Transmission Control Protocol / Internet Protocol. It is the basic protocol followed in Internet Communication.
- In order to communicate on the web, computers/devices need to understand each other. This is made possible by making all devices follow the same protocol that is TCP/IP
- The data to be sent is broken down into small data **packets** along with the address of the recipient computer by the **TCP protocol**.
- The devices called **routers**, route and transport these data packets to their destination computers using **Internet Protocol**.

Some important Protocols

- **(HTTP) Hyper Text Transfer Protocol** is a standard protocol used for communication between client (Browser) and server (Web server).
- **(HTTPS) Hyper Text Transfer Protocol Secure** encrypts username and password, and then send it to the server.
- **(SSL) Secure Sockets Layer** provides a standard security technology for establishing an encrypted connection between computers on Internet. SSL provides **security, Privacy and authentication.** capabilities to HTTP.

What is a Web Server?

- **Web Server** is the **server computer** that hosts websites or deliver services like email, blog etc. It has two components.
- **1) Web Server computer:** It is a powerful computer which is always switched on and connected to a high bandwidth Internet connection. A web server can have single or multiple processors, fast access RAM, high performance hard disks, Ethernet cards that supports fast communication.
- **2) Web Server Software:** Popular **server operating systems** include various Linux distributions (Redhat, openSUSE, Debian, Ubuntu, etc.), Microsoft Windows Server, FreeBSD, Oracle Solaris, etc

  Preferred **web server packages** are Apache Server, Microsoft Internet Information Server (IIS), Google Web Server (GWS) and nginx (pronounced as engine-x).

What is Software Port ?

- A software port is used to connect a client computer to a server to access its services like HTTP, FTP, SMTP, etc. To distinguish the ports, the software ports are given unique numbers

SL No	Port Number	Service
1	20 and 21	File Transfer Protocol (FTP)
2	22	Secure Shell (SSH)
3	25	Simple Mail Transfer Protocol (SMTP)
4	53	Domain Name System (DNS) service
5	80	Hyper Text Transfer Protocol (HTTP)
6	110	Post Office Protocol (POP)
7	443	HTTP Secure (HTTPS)

What is DNS Server ?

- **Domain Name System** (DNS) server contains a database of domain names and their IP addresses.
- **DNS returns the IP address** of a domain name requested by the client computer

How DNS searches and locates the IP address of a domain name or How DNS resolves IP address.

- a). The browser first searches its local cache memory to search whether its IP address is in the recently visited list
- b). If it is not found it check the operating system's local cache for IP address
- c). If it is not found there, it searches the DNS server of the local ISP.
- d). If IP address is not there , the ISP's DNS server initiate search for IP address starts from root server.
- e). After finding the IP address, The ISP's DNS server returns this to the browser.(If it is not found , a Page not found message displayed on browser)
- f). The browser connects to the web server using the IP address of http://dhsekerala.gov.in and the webpage is displayed in the browser window

Web Designing

- **Q) What is Web Designing?**
- Web design is the process of creating websites.
- **HTML, JavaScript** and **CSS** are the main languages that are used to design a webpage.
- **Q) Give examples of Web Designing Softwares?**
- Adobe Dreamweaver, Bootstrap, Bluefish, Microsoft Expression Web.
- **Q) What is a Browser? Give Examples.**
- A web browser is a software application for accessing information on the World Wide Web. Eg: Google Chrome, Opera, Firefox, Safari, UC Browser

What is Static & Dynamic Web pages

- **Static Page**: Static web pages are web pages that remain the same all the time until their code is changed manually. Web pages created using only HTML are usually a Static Page. EG: wikipedia
- **Dynamic Page**: The web pages that contain server side code which creates a web page each time it is accessed are called **Dynamic Web page**.

Static & Dynamic Web pages

SL No	Static Web Page	Dynamic Web Page
1	The content and layout of a web page is fixed	The content and layout may change during run time
2	Static web pages never use databases	Database is used to generate dynamic content through queries
3	Static web pages directly run on the browser and do not require any server side application program	Dynamic web page runs on the server side application program and displays the results
4	Static web pages are easy to develop	Dynamic web page development requires programming skills

What are the Types of Scripting Languages

- There are two types of Scripting Languages
  (i) Client Side Scripting
  (ii) Server Side Scripting
- (i) **Client Side Scripting**: Client side scripting is used to perform any task at the client side and is executed in the browser. It is used for validation at user end. User can block it. Also the client side browser affects it.
- (ii) **Server Side Scripting**: Server side scripts are executed in the server. The output of the execution sent to the client in the form of an HTML page . The server side scripting is used to connect database etc. The user can't block it. The Client side browser does not affect it

What are Scripts ?

- Scripts are program codes written inside HTML pages.
- Scripting languages like JavaScript, VB script, PHP, Perl are used to create Dynamic Web Pages
- Scripting languages are interpreted by a web browser or by a web server software

Compare Client Side Scripting & Server Side Scripting

SL No	Client Side Scripting	Server Side Scripting
1	Script is copied to the client browser	Script remains in the web server
2	Script is executed in the client browser	Script is executed in the web server and the web page produced is returned to the client browser
3	Client side scripts are mainly used for validation of data and the client	Server side scripts are usually used to connect to databases and return data from the web server
4	Users can block client side scripting	Server side scripting cannot be blocked by a user
5	The type and version of the web browser affects the working of a client side script	The features of the web browser does not affect the working of server side script

What are Scripting Languages? Give Example?

- **a) JavaScript** is a **client side scripting** language used to make web pages interactive. It is developed by **Brendan Eich**. It can used for validation, simple calculations etc.
- **b) VBScript** is both a **client side scripting** language and a **server side scripting** language. Developed by **Microsoft** Corporation. It only work with Windows operating system and Internet Explorer.
- **c) PHP:** Hypertext Preprocessor is a **server side scripting** tool originally created by **Rasmus Lerdorf.** It supports **database programming**
- **d) Microsoft Active Server Pages (ASP)** is a **server-side scripting** environment that can be used to create and run interactive web applications.It is executed only on Windows operating systems
- **e) Java Server Pages (JSP)** is a **server side scripting** language uses Java as programming language developed by Sun Microsystems.

- **Q) What is Ajax? What is its use?**
- Ajax is Asynchronous JavaScript and Extensible Markup Language (XML).
- With its help a dynamic content can be displayed on web page without reloading the entire page. It reduces data transfer.
- Ajax works only if the browser is able to handling Javascript.

What is Cascading Style Sheet ?

- Cascading Style Sheets (CSS) is a style sheet language used for describing the formatting of a document written in HTML.
- Using CSS, we can control the colour of the text, the style of fonts, the spacing between paragraphs, how columns are sized and laid out, borders and its colours, what background images or colours are used etc.
- A CSS file allows us to separate HTML content from its style.

How to implement Cascading Style Sheet

- CSS can be implemented in three different ways - inline, embedded and linked.
- **a) Inline:** In inline style, the CSS style is applied to each tag separately using the style attribute in the body part of the web page.
- **b) Embedded:** Embedded CSS codes are placed within the <HEAD> part of the web page.
- **c) Linked :** Linked CSS implementation is done using an external file with the file extension .css that contains only CSS code and is linked with the web page.

What is HTML?

- Hyper Text Markup Language. HTML is the most widely used language to write web pages. Every web page is actually an HTML file.
- Each HTML file is a plain text that defines a set of commands for creating hypertext documents. These commands are known as **HTML tags**.
- While using HTML tags, some keywords may be attached to them, which make the instruction more specific. These words are known as **Attributes**.

Basic Structure of an HTML document

```
<HTML>
   <HEAD>
        <TITLE>This is the title of web page</TITLE>
   </HEAD>

   <BODY>
   Hello, Welcome to the world of web pages
   </BODY>
</HTML>
```

- HTML is not case sensitive.
- All HTML pages begin with the tag **<HTML>** and end with tag **</HTML>**.
- There are mainly two sections in an HTML document namely **head section** and **body section**.
- **1) Head section:** The <HEAD> tag is used to define the head section. The head section **contains the information about the document, including the title of the web page**. The **<TITLE>** tag is used to define the title of the page, which will be displayed on the title bar of the browser window.
- 2) **Body Section:** The **<BODY>** tag is used to define the body section. The body section contains the **contents to be displayed in the web page.**

What are Container tags and empty tags ?

- There are two types of tags:
- **1) Container Tags:** Tags that require opening tag as well as closing tag are known as **container tags**.
  Eg: <HTML> </HTML>
- **2) Empty Tags**: Tags do not require closing tag is called as E**mpty tags**. Eg:
,<HR>,<IMG>,

What are the Essential HTML tags ?

- 1) <HTML>
- 2) <HEAD>
- 3) <TITLE>
- 4) <BODY>

1) <HTML>

- The <HTML> tag identifies the document as an HTML document.
- <HTML> is always the first tag in an HTML page and the </HTML> is the last tag.
- Everything else in the web page is in between these two tags.
- The Head section and the Body section lie inside the <HTML> and </HTML> tags.
- It is a **container tag pair**.
- The main attributes of the <HTML> tag are **Dir** and **Lang**.

- **Dir**

  The Dir attribute specifies the direction of the text to be displayed on the web page.

  Its values are **ltr** (left-to-right) or **rtl** (right-to-left).

  The default value of Dir attribute of HTML tag is Ltr

  Eg: <HTML Dir = "rtl">
- **Lang**

  The Lang attribute specifies the language used within the document. Eg. <HTML Lang = "en">

2) <HEAD>

- It contains the head of an HTML document, which holds information about the document such as its **title**, **scripts used**, **style definitions**, etc.
- The tag pair <HEAD> and </HEAD> declares the head section.
- It is also a **container tag pair.**

3) <TITLE>

- It is a container tag pair that contains the title of the HTML document, which will appear in the web browser's title bar.
- The search engine uses the Title to identify the page.
- The tag pair <TITLE> and </TITLE> is used inside the tag pair <HEAD> and </HEAD> to mention the document title.
- It is also a **container tag pair.**

4) <BODY>

- The body tag pair <BODY> and </BODY> specifies the document body section.
- This section contains the content to be displayed in the browser window. Hence, all other tags, which define the document content are given in the body section.
- The important attributes used in <BODY> tag are
  a) **Background**
  b) **Bgcolor**
  c) **Text**
  d) **Link, Alink, Vlink**
  e) **Leftmargin and Topmargin**

a) **Background**

- This attribute sets an image as background for the documents body.
- The general format is:
  <BODY Background = "URL of the picture">
- Eg:
  <BODY Background = "Sky.jpg">
- we have to place the image file in the current working directory.

HTML code to set image as background for a webpage

```
<HTML>
    <HEAD>
        <TITLE>This is the title of web page</TITLE>
    </HEAD>

    <BODY Background="sky.jpg">
    Hello, Welcome to the world of web pages
    </BODY>
</HTML>
```

b) Bgcolor

- This attribute specifies a colour for the background of the document body.
- For example, <BODY Bgcolor = "grey"> will display the background in grey colour.
- The value of Bgcolor attribute can be given in two ways.
  1) **Color_name** - specifies the background colour with a colour name (like "red", "grey" etc.)

  2) **Hex_number** - specifies the background colour with a hexadecimal code (like "#ff6080", "#303030" etc.). Each hexadecimal code will be preceded with a hash sign #.

c) Text

- This attribute specifies the colour of the text content in the page.
- By default the browser displays the text in black colour on a white/grey background.
- The colour of the text can be changed using the attribute Text.
- For example,

  <BODY Text = "yellow">

  shows the text in yellow colour.
- The value of Text attribute can be given as colour name or hexadecimal code.
  For example, Text = "Blue" or Text = "#00FFDD" etc.

d) Link, Alink, Vlink

- A hyperlink is an element, a text or an image that we can click on, and jump into another document or another section of the same document.
- A hyperlink points to a whole document or to a specific element within a document.
- **Link:** This attribute specifies the colour of the hyperlinks that are not visited by the viewer. The default colour for Link attribute is blue.
- **Alink**: It specifies the colour of the active hyperlink. The link remains active only for the moment the mouse is clicked on it. Hence at the time of selection the colour of the link will be changed to Alink value. The default Alink colour is green.
- **Vlink:** It specifies the colour of the hyperlink which is already visited by the viewer. The default colour for Vlink is purple.

e) **Leftmargin and Topmargin**

- The margin refers to the blank area left from the edge of the page.
- **Leftmargin** attribute is used to leave some blank area on the left side of the document
- **Topmargin** refers to the blank area at the top edge of the document window. The value is specified in pixels.

Some common tags

- The tags that are used for formatting the text contents in the body section of the HTML document is called **formatting tags**.
- 1) **<H1>, <H2>, <H3>, <H4>, <H5> and <H6> - Heading tags**
- **2) <P> tag - Creating paragraphs**
- 3) **
 tag - Inserting line break**
- **4) <HR> tag - creating horizontal line**
- **5) <CENTER> tag - Centering the content**
- **6) Text formatting tags**
- **7) <PRE> - Displaying preformatted text**
- **8) <ADDRESS> - Displaying the address**
- **9) <MARQUEE> - Displaying text in a scrolling Marquee**
- **10) <DIV> - Formatting a block of text**
- **11) <FONT> - Specifying font characteristics**

1) **<H1>, <H2>, <H3>, <H4>, <H5> and <H6> - Heading tags**

- A heading is a word, phrase, or sentence given at the beginning of a written passage that explains what it is about.
- It is a **container tag**
- HTML has six levels of headings from <H1> to <H6>.
- Here <H1> creates the biggest text and <H6> the smallest. Eg:

  <H1 Align= "left"> This is a Heading type 1 </H1>
- While displaying any heading, browser adds one line before and one line after that heading.
- The main attribute of this tag is **Align** and the possible values are,
  i) **Left** : Text is aligned to the left margin.
  ii) **Right** : Text is aligned to the right margin.
  iii) **Center**: Text is aligned to the centre of the page.

2) <P> tag - Creating paragraphs

- The <P> tag enables us to organise the text within the <BODY> tag into paragraphs.
- It indicates a new paragraph and instructs the browser to add a blank line before the paragraph.
- It is a **container tag**

  Eg:
  <P Align= "right"> This paragraph contains a lot of spaces in the source code,but the browser ignores it. </P>
- The main attribute of this tag is **Align** and the possible values are,
  i) **Left** : Text is aligned to the left margin.
  ii) **Right** : Text is aligned to the right margin.
  iii) **Center** or **Justify**: Text is aligned to the centre of the page.

3)
 tag - Inserting line break

- It creates a line break within a block of text in a web page. The
 tag is used to break the current line of text and continue from the beginning of the next line.
- It is an **empty tag**

4) <HR> tag - creating horizontal line

- The <HR> tag produces a horizontal line (rule) spread across the width of the browser window. It is an **empty tag**.
- The attributes are:
  i) **Size** : Changes the size(thickeness) of the line. Value is given in pixels

  ii) **Width** : Changes the width(length) of the line. Value given in pixels or percentage.

  iii) **Align** : Values are left, right or center

  iv) **Noshade** : Applies no shade

  v) **Color** : Changes the color of line

- EG:
  <HR Size= "10" Width= "30%" Align= "center" Noshade>

5) <CENTER> tag - Centering the content

- The <CENTER> tag brings the content to the centre of a web page horizontally.
- The content may be text, image, table, etc.
- This is a **container tag**
- There is no attribute for this tag.
- Eg:
  <CENTER> Welcome </CENTER>

6) Text formatting tags

- Using text formatting tags we can make texts bold, italics, underline etc
- **i) <B>** This tag sets the text style to bold.
- ii) **<I>** It sets the text style to italics.
- iii) **<U>** Used to underline a text in HTML. *The formatting tags <U>, <B> and <I> can be combined, so that the content will become bold, italicized and underlined.*
- iv) **<S>** and **<STRIKE>** - They display the text in strike through style.

6) Text formatting tags

- v) **<BIG>** Making the text big sized.
- vi) **<SMALL>** Making the text small sized.
- Vii) **<STRONG>** Making bold text .It is just the same as <B> tag. The strong element is used to emphasize a phrase of text content.
- Viii) **<EM>** Used to emphasise the text. Text is usually rendered in italics. Effect is same as that of <I> tag.
- ix) **<SUB>** and **<SUP>** tags- Used to create subscripts and superscripts. EG:
  H_2O H₂O

  $(a+b)^2$ (a+b)²

Previous Questions

- 1.The default port number of http is
  (a) 20 (b) 80 (c) 110 (d) 53
- **Ans**: 80
- 2. Write HTML tag to set the colour of hyperlink to red .
  (a) <A colour="red" > (b) <A colour="FF0000" >
  (c) <BODY LINK="Red" > (d)<BODY ALINK="Red" >
- **Ans** : c
- 3.A webpage is created to display the result of engineering entrance examination .
  (a)What type of webpage it is ?
  (b) Mention any two features of it.
- **Ans** : Dynamic Web page
- 4. Write any two features of dynamic web page.

Previous Questions

- 5……. tag is used to make the size of the text smaller than current text in HTML.
  (a)<b> (b) <small> (c) <sub> (d) <sup>
- **Ans**: b
- 6. Compare client side scripting and server side scripting.
- 7. Compare client side scripting and server side scripting languages.
- 8. Compare static and dynamic webpages.
- 9. ... . is a server that act as a bridge between merchant server and bank server.
- 10. DNS stands for .....

Previous Questions

- 11. Write HTML tags used to insert comments in HTML web pages
- 12. Suppose you are browsing the website www.keralapsc.gov.in explain how DNS resolves this ip address
- 13. What is the port number for the following web services
  (i) Simple Mail Transfer Protocol
  (ii) HTTP secure (HTTPS)
- 14. (i) What is the use of reserved characters for HTML entities?
  (ii) List any four reserved characters and its use
- 15. Name any two attributes of the following tags
- (a) <HTML>
- (b) <MARQUEE>
- (C) <FONT>

Chapter 6
Client Side Scripting Using JavaScript

JavaScript

- JavaScript is the most commonly used Client Side Scripting Language
- It was developed by Brendan Eich
- It is supported by all browsers
- It follows the same syntax as C++

Sample JavaScript Program

```
<HTML>

    <HEAD> <TITLE>Javascript - Welcome</TITLE>
    </HEAD>

    <BODY>
        <SCRIPT Language= "JavaScript">
                document.write("Welcome to JavaScript.");
        </SCRIPT>

    </BODY>

</HTML>
```

Which tag is used to include script in an HTML program? Explain its attribute?

- **<SCRIPT>** tag is used to include scripting code in an HTML page.
- **Attributes:**
- **Language:** used to specify the name of the scripting language used.
- **Source**: specifies the location and file name of the external javascript file..

What is the use of Javascript engine?

- Java script engine is a virtual machine for executing javascript.
- Every browser has a java script engine.
- If the html page contain a java script then browser passes it to the javascript engine.

What is a Functions in JavaScript ?

- A function is a group of instructions with a name.
- **There are two types of functions**:

1)Built-In function

2)User Defined function

- **Advantage of Function:** If we need to execute a piece of program code more than once in a web page, the code has to be written only once within the function

END

User defined functions

```
function function_name()
{
    statements;
}
```

Function Header

Function Body

What are the Data Types in JavaScript ?

- **Data types in Javascript are**:

1)**Number**:-They include integers, floating point numbers and signed numbers.

2)**Strings**:-A string is a combination of characters, numbers or symbols enclosed within double quotes.

3)**Boolean**:-A boolean data can be either True or False(Without double quotes).

END

How to declare Variables in JavaScript ?

- A variable can be declared by using the keyword var. Eg. var n;
- Data type of the variable is decided only when a value is assigned to it.

Variable declaration Syntax

```
<SCRIPT Language= "JavaScript">
    var a, b, c, d, e, f;
    a = 25;
    b = 18.5;
    c = "INDIA";
    d = true;
    e = "true";
</SCRIPT >
```

END

What are the types of Operators used in JavaScript ?

1) **Arithmetic operators**
2) **Assignment operators**
3) **Relational operators (Comparison operators)**
4) **Logical operators**
5) **String addition operator**

1) Arithmetic operators

Operator	Description	Example	Value of y	Result (x)
+	Addition	x = y + 10	15	25
-	Subtraction	x = y - 10	15	5
*	Multiplication	x = y * 3	15	45
/	Division	x = y / 2	15	7.5
%	Modulus (division remainder)	x = y % 2	15	1
++	Increment	x = ++y x = y++	15 15	16 15
--	Decrement	x = --y x = y--	15 15	14 15

2) Assignment operators

Operator	Description	Example	Value of a	Value of b	Result (a)
=	Assignment	a = b	10	3	3
+=	Add and assignment	a+=b	10	3	13
-=	Minus and assignment	a-=b	10	3	7
*=	Multiply and assignment	a*=b	10	3	30
/=	Divide and assignment	a/=b	10	3	3.33
%=	Modulus and assignment	a%=b	10	3	1

3) Relational operators (Comparison operators)

Operator	Description	Example	Value of a	Value of b	Result
==	Equal to	a==b	10	3	false
!=	Not equal to	a!=b	10	3	true
<	Less than	a<b	10	3	false
<=	Less than or equal to	a<=b	10	3	false
>	Greater than	a>b	10	3	true
>=	Greater than or equal to	a>=b	10	3	true

4) Logical operators

Operator	Description	Example	Value of a	Value of b	Result
&&	AND	a && b	true	false	false
||	OR	a || b	true	false	true
!	NOT	!a	true		false

String addition operator in JavaScript

- The operator + is used to add two numbers.
- The same operator + is used to add two strings also.
- Adding two strings means concatenating two strings.
- Example

```
var x, y,z;
x = “A good beginning ”;
y = “makes a good ending.”;
z = x + y;
```

Output z will have the value:
A good beginning makes a good ending

END

Control Structures in JavaScript

- Control structures are used to change the sequential flow of execution in a program.
- Frequently used control structures in JavaScript are:

1) **if**
2) **switch**
3) **for**
4) **while**

if

- It is used to execute a statement or a group of statements based on some condition.

Syntax of simple if	Syntax of if with else part

`if (test_expression)`
`{`
`  statements;`
`}`
	`if (test_expression)`
	`{`
	`  statements;`
	`}`
	`else`
	`{`
	`  statements;`
	`}`

switch

- Switch is a multi-branching statement. Using this, different program codes can be selected for execution based on the value of an expression.
- Syntax:

```
switch (expression)
{
   case value1:
   statements;
   break;

   case value2:
   statements;
   break;

   default:
   statements;
   }
```

for

- for loop is used to execute a group of instructions repeatedly.
- The syntax of for loop is:

```
for (initialisation; test_expression;update_statement)
{
Body of loop
}
```

while

- while loop is a simple loop that repeatedly execute a group of statements based on a condition.
- The syntax is:
  while (test_expression)
  {
  statements;
  }
- Here the test_expression is a condition. The statements inside the loop will be executed as long as the condition remains true.

END

Built in Functions in JavaScript

- The most commonly used functions:

1)**alert()**

2)**isNaN()**

3)**toUpperCase()**

4)**toLowerCase()**

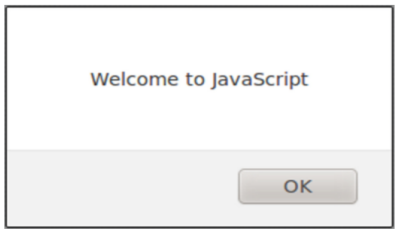
5)**chartAt()**

6)**length property**

1) alert()

- It is used to display a message on the screen
- Eg:
  alert(" Welcome to JavaScript ")

Output



2) isNaN()

- It is used to check whether a value is a number or not.
- NaN stands for not a number
- The function returns true if the given value is not a number

isNaN("welcome");	True
isNaN(123);	False
IsNaN("13.5 ");	False
isNaN("A123 ");	True
isNaN("Score50 ");	True

3) toUpperCase()

- It returns the upper case form of the given string.
- Eg:

```
var x,y;
x = "JavaScript";
y = x.toUpperCase();
alert(y)
```

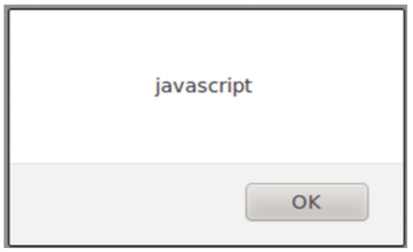
Output

4) toLowerCase()

- It returns the lower case form of the given string.
- Eg:

```
var x,y;
x = "JavaScript";
y = x.toLowerCase();
alert(y)
```

Output

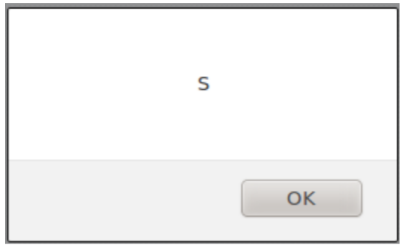


5) chartAt()

- This function returns the character at a particular position.
- chartAt(0) returns the first character in the string.
- Eg:

```
var x,y;
x = "JavaScript";
y = x.chartAt(4);
alert(y)
```

Output

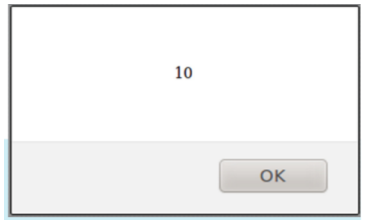


6) length property

- This function returns the length of a string
- Length means number of strings in a string
- Eg:

```
var x,n;
x = "JavaScript";
n = x.length;
alert(n)
```

Output



END

What are the different methods for adding scripts in an html page?

- Scripts can be placed inside HTML code in three different ways:

  a). **Inside the <Head >section of HTML**. Advantage: execute scripts faster. Disadvantage: scripts that are to be executed while loading the page will not work.

  b). **Inside <Body>** script will be executed while the content of the web page is being loaded.

  c). **External JavaScript file**: Scripts can be placed into an external file ,saved with .'js' extension. load pages faster.

Previous Questions

- 1. Write any three built-in functions in Javascript and explain its use
- 2. Name the keyword used to declare variable in Javascript.
- 3. What is the difference between isNaN() and length() functions in JavaScript ?
- 4. Write the built in JavaScript functions used for the following situations
  (i) Display warning message in the screen
  (ii) Character at particular position
  (iii) Convert upper case to lowercase
- 5. In JavaScript :
  (a) Explain any three types of operators used
  (b) Describe any two data types used.

Chapter 7
Web Hosting

What is Web Hosting?

HOME

- **Web hosting** is the service of providing storage space in a web server to serve files for a website to be made available on the Internet.
- The companies that provide web hosting services are called **web hosts**. Eg: Hostgator, Hostinger

Explain different types of web hosting?

HOME

1) **Shared hosting** : It is the cheapest option for web hosting. Here many different websites are stored in one single web server and they share the resources like RAM , CPU, Bandwidth etc. It is easy to use but if any web site using the server use more traffic then it slow down all other websites.

2) **Dedicated hosting** : It is expensive but the entire web server is assigned to the website. The client has the full freedom to choose the hardware and software for the server and full control over the web server.

3) **Virtual Private Server(VPS)** : It is a physical server that is virtually partitioned in to several servers using virtualization technology with softwares like FreeVPS, Virtualbox etc. VPS provide dedicated amount of RAM , Bandwidth etc . Each VPS works as fully independent servers. Its cost is less than dedicated server.

List the factors that decide the type of web hosting

HOME

- a) Amount of storage space needed.
- b) The number of visitors expected to visit the website
- c) The use of resources like database, programming support etc..

END

HOME

- Q1) A supermarket wishes to take its business online. It plans to accept orders for its products through a website and receive payments online?
- a). Which type of hosting is suitable for this website?
- **ANS**: Virtual Private server(VPS) is suitable for this.
- b). Explain the reason for your choice?
- **ANS**: Cost is less compared to dedicated server. Online payment requires secure transfer. By using VPS , we can set up our own security measures compared to shared hosting.

HOME

- **Q1) What is Domain name? What is domain name registration?**
- **ANS: Domain names** are used to identify a web site on the internet (www.google.com). Most web hosting companies offer domain registration facility.The domain name chosen must be unique.

HOME

- **Q2) How to get information about any website?**
- **ANS**: The website www.whois.net which checks domain name with ICANN(Internet Corporation for Assigned Names and Numbers) database.
- **Q3) What is WHOIS ?**
- **ANS: WHOIS** information contains the name , address, telephone number and e-mail address of the registrant.

HOME

- Q4) What is **A record** ?
- It is used to store the IP address of a web server connected to a domain name. The 'A record' can be modified by logging into the control panel of the domain.

END

What is FTP Client Software ?

HOME

- File Transfer Protocol (FTP) is used to transfer files from one computer to another in a network.
- In web hosting, an FTP client software is used to transfer files of our website from our computer to the web server. Eg. FileZilla, CuteFTP, SmartFTP etc..
- **What is SFTP ?**
- **ANS**: For secure transfer SSH FTP (SFTP) is used. It encrypts and send information like user name password etc ..

END

What is Free Hosting or blogs?

HOME

- Free hosting provides web hosting services free of charge. The service provider displays advertisements to meet the charges. They may have some restrictions like amount of storage, types of files etc.
- Free hosting services usually provide either their own sub domain(our sitename.host.com) or directory service(www.host.com/oursitename).
- Eg: www.panangadvhss.wordpress.com

END

What is Content Management System (CMS) ?

HOME

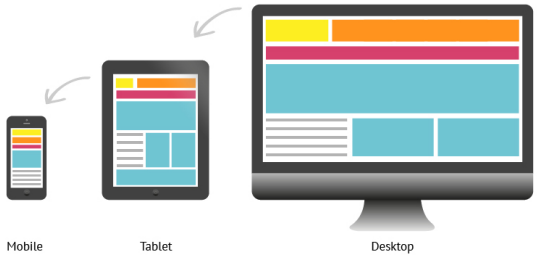
- It is a web based software system which is capable of creating, administering and publishing web sites.
- It provide easy way to design and manage attractive web pages.
- It is economical and easy way to develop a web sites.
- Some popular CMS software are WordPress, Drupal, Joomla etc.

END

What is Responsive web design ?

HOME

- Responsive web design is the custom of building a website suitable to work on every device and every screen size.



Previous Questions

HOME

- 1. Identify the odd one :
  (a) Word Press (b) File Zilla (c) Joomla (d) Drupal
- **Ans** : (b) File Zilla
- 2. What type of hosting package is suitable for a multinational online shopping site? Mention any two advantages of the package.
- **Ans** : Dedicated hosting It is expensive but the entire web server is assigned to the website. The client has the full freedom to choose the hardware and software for the server and full control over the web server.
- 3. What is the need of registering a domain name for a website ?Explain the procedure of domain name registration.
- 4. What is SFTP ?
- 5. ..... provide an easy way to design and manage attractive websites.
  (a) Free hosting (b) CMS (c) WHOIS (d) FTP
- **Ans**: b

HOME

- 6. Compare shared hosting and VPS
- 7. Amitha wanted to get the name ‘www.smartproduct.com’ for her newly designed website. How is it possible?
- 8. Ajith created a website using the software ‘Joomla’. What is the peculiarity of this software and write any four advantages of using this software.
- 9. A designed website has to be uploaded into ..... To make it available to the internet users all over the world.
- **Ans**: Web Host
- 10. Differentiate shared and dedicated web hosting.

HOME

- 11. What is CMS ? Give two examples
- 12. What are the merits and demerits of free web hosting ?
- 13. Define web hosting ?
- 14. What is responsive web design ?

Chapter 8
Database Management System

- **Q) What is a database?**
- **ANS:** Database is an organized collection of data related to a particular enterprise. It may contain different types files each one containing many records.
- **Q) What is DBMS?**
- Database Management System is a collection of inter related data and a set of programs to store, modify and access those data

What are the advantages of DBMS ?

- a). **Controlling Data redundancy**:-Duplication of data is known as data redundancy. In DBMS data is kept in one place in centralized manner and the users can access this centrally maintained date for their purpose.
- b). **Data consistency** :- Data redundancy leads data inconsistency (different copies of same data hold different values because the updation of data may not occur in all the copies. In DBMS it avoided by eliminating redundancy.
- c). **Efficient data access**: DBMS utilizes a variety of techniques to store and retrieve data efficiently.
- d). **Data can be shared**:- The data stored in the Database can be shared among many users and new programs can be developed to share the existing data.
- e). **Data Integrity**: Integrity refers to the overall completeness, accuracy and consistency of data in the database. It can be achieved by use of error checking , validation, avoiding duplication etc.

- f). **Security** :- Security refers to accidental or intentional disclosure or unauthorized access, modification or destruction. Through the use of passwords, information in the database is made available only to authorized person. .
- g). **Sharing of data** : The data stored in the database can be shared among several users or programs even simultaneously and each may use it for different purposes.
- h). **Enforcement of Standards**:- The database Administrator defines standards like display formats, report structure, update procedures, access rules etc.. for the DBMS. It is helpful when data transfer occurs between systems.
- i). **Crash recovery** : If the system crashes data in the database may become unusable. DBMS provides some mechanism to recover data from the crashes.

What are the components of a DBMS (database)?

- The components of a database are
- a). **Hardware** : It include actual computer system used for storage and retrieval of Database. It include computers, storage devices, network devices, and other supporting devices.
- b). **Software** : It consists of DBMS, application programs and utilities. DBMS consists of different components that handles tasks like data definition, data manipulation

- c). **Data** :The database should contain all the data needed by the organization. For effective storage and retrieval of information , data is organized as fields, records and files.
  1) Field : A field is a smallest unit of stored data. Each field has a specific type.(eg. Name,- Char, Mark,-num etc).
  2) Record : A record is a collection of related fields. A record store an instant of the relation or the table.
  3) File : A file is a collection of all occurrence of one type of record.
- d). **Users** : The users of database can be classified depending on the mode of their interactions with DBMS. The different categories of users are Database Administrator, Application Programmer, Sophisticated users, and naïve users.
- e). **Procedures** : Procedures refers to the instructions and rules that govern the design and use of the database.

What is database abstraction?

- The developers in a database system hide the complexity from users through different levels of abstraction. There are three types of abstraction
- a). **Physical Level Abstraction**-It is the lowest level of abstraction. Physical level describes how data is actually stored in the storage medium like disk, tape etc.. The DBMS hide its details from the programmers.
- b). **Logical (conceptual) Level Abstraction**- It is the next high level of abstraction. Logical level describes what data are stored in the database and what relationship among them. In this level the records and its types are defined. The logical level abstraction is done by the Data Base Administrator(DBA).
- c). **View Level Abstraction**- This is the highest level of abstraction. It concerned with the way in which the individual users view the data. Most of the users may not need all the data stored in the database. They need only a part of it. So all other data are hide from the user

What is meant by data independence?.What are different types of data independence?

- The ability to modify a schema definition at one level (Physical, Logical, View levels) without affecting the schema definition at the next higher level is called data independence. The two types of data independence are ,
- a). **Physical data independence**: It is the ability to modify the physical schema without affecting the conceptual(logical) schema. So the application programs remain same even though the physical schema get modified
- b). **Logical data independence**: It is the ability to modify the logical schema without affecting the view level. So the application programs remains same.. It is more difficult to achieve because the application programs are heavily depend on logical structure.

Who are the users of database?

- Users of the database can be classified in to the following groups,
- a) **Database administrator (DBA)**: The person has control over the centralized and shared data in a DBMS. He is the in charge of creating, modifying and maintaining 3 levels of DBMS.
- b) **Application Programmer**: They are computer professionals and interacts the DBMS through application programs. Application programs are programs written in any host languages like Java, C++ etc.. and interact with DBMS through Data Manipulation Language (DML).
- c). **Sophisticated Users** : The users are familiar with DBMS like scientist, business analyst etc. The interact with DBMS by their own Query or request
- d). **Naive Users/ End users**: The uses don't know about the physical and logical structures of DBMS like clerical staff in an office.

- **What is schema?**
- The description or structure of a database is called database schema.

What are the duties of a DBA?

- The person has control over the centralized and shared data in a DBMS.
- DBA is responsible for,
- **a). Design of the physical and conceptual Schemas.**
- **b). Security and authorization.**
- **c). Data availability and recovery from failures.**

RDBMS

What is a RDBMS or Relational Model ?

Relational Database Management System (RDBMS) represents the database as a collection of relations, each of which is assigned a unique name.

The relation resembles a table.

Relation 1

Data table 1: Project table

Project number	Description	Dept. number
155	Payroll	257
498	Widgets	632
226	Sales Manual	598

Relation 2

Data table 2: Department table

Dept. number	Dept. name	Manager SSN
257	Accounting	005-10-6321
632	Manufacturing	549-77-1001
598	Marketing	098-40-1370

Relation 3

Data table 3: Manager table

SSN	Last name	First name	Hire date	Dept. number
005-10-6321	Johns	Francine	10-07-1997	257
549-77-1001	Buckley	Bill	02-17-1979	632
098-40-1370	Fiske	Steven	01-05-1985	598

END

What are the various terminologies in RDBMS

1) **Entity:** An entity is a person or a thing that can be distinguishable from others. Eg. Student, Book etc..
2) **Relation** : Relation is a collection of data elements organized in rows and columns. It is also called a table.
3) **Tuple** : A row in a relation is called a tuple. It consists of a complete set of values used to represent a particular entity. Values of each attribute are taken from its domain.
4) **Attribute** : The columns of a relation are called attributes. Eg. Ad.no, name, age etc are the attributes of the relation Student.
5) **Degree** : The no of attributes(columns) in a relation is called degree of that relation.
6) **Cardinality** : The no of rows (tuples) in a relation is called cardinality of that relation
7) **Domain** :Domain is a range of values from which a particular value of an attribute for a can be drawn. Eg. 0 to 100 may be domain of values for the attribute mark in student relation.
8) **Instance** : An instance of a relation is a set of tuples has the same number of fields as the relational scheme.

Student

AdmNo	Roll	Name	Batch	Marks	Result
101	24	Sachin	Science	480	EHS
102	14	Rahul	Commerce	410	EHS
103	4	Fathima	Humanities	200	NHS
104	12	Mahesh	Commerce	180	NHS
105	24	Nelson	Humanities	385	EHS
106	8	Joseph	Commerce	350	EHS
107	24	Shaji	Humanities	205	NHS
108	2	Bincy	Science	300	EHS

Relation – Student
Attribute – AdmNo, RollNo,Name, Batch, Marks, Result
Degree-- 6
Cardinality – 8
Domain of Result – EHS, NHS
Domain of RollNo – Positive integer number

END

What are the different Keys in a relation?

- Tuples in a relation must be distinct. So there should be a way to identify each tuples in a relation. Keys allow us to make such distinctions.
- **a). Candidate Key:**-Candidate key for a relation is the minimal set of attributes that uniquely identifies each tuple (row) of the relation. There may more than one candidate key in a relation.
- **b). Primary Key:**-It is one of the candidate keys chosen to be unique identifier of the relation by the database designer. If there is more than one candidate key, then key with least no. of attributes is chosen as Primary key

- **c). Alternate Key:**-The candidate keys that are not chosen as primary key is known as alternate keys. In the above
- **d). Foreign key:-**An attribute or set of attributes in a table which is a primary key in another table is called a foreign key. It helps to link two or more tables. So it is also called Reference key.

What is relational algebra?

- The collection of operations that is used to manipulate the entire relations of a database is known as relational algebra.
- The relational operations takes one or two relation as input and produce a new relation as output.

What are the fundamental operations in Relational Algebra ?

- 1) **Select operation:** SELECT operation is used to select rows from a relation that satisfies a given predicate. The predicate is a user defined condition to select rows. It is denoted by the symbol σ (sigma)
- 2) **Project operation**: The project operation retrieves the columns from a relation. It is denoted by the symbol Π (pie)
- 3) **Union Operation**: It combines two table and forms a new relation. It is denoted by U Duplication of tuples are eliminated.

- 4). **Intersection Operation**: The Intersection operation combines the common rows from two tables and forms a new relation. It is denoted by the symbol ∩
- 5) **Set Difference Operation**: The Set difference operation find tuple that are in one relation but are not in another relation. It is denoted by the symbol -
- 6)**Cartesian Product(Cross Product**): The Cartesian Product operation combines tuples from two relations. It is denoted by the symbol X

SELECT Operation

SELECT operation is used to select rows from a relation that satisfies a given predicate.

The predicate is a user defined condition to select rows.

It is denoted by the symbol σ (sigma)

Syntax : $\sigma_{condition}$ (Relation)

SELECT operation Examples

Student

AdmNo	Roll	Name	Batch	Marks	Result
101	24	Sachin	Science	480	EHS
102	14	Rahul	Commerce	410	EHS
103	4	Fathima	Humanities	200	NHS
104	12	Mahesh	Commerce	180	NHS
105	24	Nelson	Humanities	385	EHS
106	8	Joseph	Commerce	350	EHS
107	24	Shaji	Humanities	205	NHS
108	2	Bincy	Science	300	EHS

σ Batch=”Commerce” (Student)

ANSWER

σ Batch=”Commerce” (Student)

AdmNo	Roll	Name	Batch	Marks	Result
102	14	Rahul	Commerce	410	EHS
104	12	Mahesh	Commerce	180	NHS
106	8	Joseph	Commerce	350	EHS

SELECT operation Examples

Student

AdmNo	Roll	Name	Batch	Marks	Result
101	24	Sachin	Science	480	EHS
102	14	Rahul	Commerce	410	EHS
103	4	Fathima	Humanities	200	NHS
104	12	Mahesh	Commerce	180	NHS
105	24	Nelson	Humanities	385	EHS
106	8	Joseph	Commerce	350	EHS
107	24	Shaji	Humanities	205	NHS
108	2	Bincy	Science	300	EHS

σ Admno<105 (Student)

ANSWER

σ Admno<105 (Student)

AdmNo	Roll	Name	Batch	Marks	Result
101	24	Sachin	Science	480	EHS
102	14	Rahul	Commerce	410	EHS
103	4	Fathima	Humanities	200	NHS
104	12	Mahesh	Commerce	180	NHS

Project Operation

The project operation retrieves the columns from a relation.

It is denoted by the symbol Π (pie)

Π column1, column2……. (Relation)

Example Project

Student

AdmNo	Roll	Name	Batch	Marks	Result
101	24	Sachin	Science	480	EHS
102	14	Rahul	Commerce	410	EHS
103	4	Fathima	Humanities	200	NHS
104	12	Mahesh	Commerce	180	NHS
105	24	Nelson	Humanities	385	EHS
106	8	Joseph	Commerce	350	EHS
107	24	Shaji	Humanities	205	NHS
108	2	Bincy	Science	300	EHS

Π Roll,Name (Student)

Example Project

Π Roll,Name (Student)

Roll	Name
24	Sachin
14	Rahul
4	Fathima
12	Mahesh
24	Nelson
8	Joseph
24	Shaji
2	Bincy

Example Project

1. Π Roll, Name (σ Admno < 105 (Student))

Roll	Name
24	Sachin
14	Rahul
4	Fathima
12	Mahesh

Union Operation

The Union operation combines two table and forms a new relation.

It is denoted by the symbol U

The union operation is valid only when the two relations are in union compatible.

Two relations are union-compatible, then they have the same number of attributes, and corresponding attributes have the same domain.

Syntax : Relation1 U Relation2

Example Union

Arts

AdmNo	Name	BatchCode
101	Sachin	S2
103	Fathima	H2
106	Joseph	C2
110	Niktha	S1
132	Vivek	C1
154	Nevin	C1

Sports

AdmNo	Name	BatchCode
102	Rahul	C2
103	Fathima	H2
105	Nelson	H2
106	Joseph	C2
108	Bincy	S2
132	Vivek	C1
164	Rachana	S1

Example Union

Details students who participated in arts, sports or both

Arts U Sports

AdmNo	Name	BatchCode
101	Sachin	S2
103	Fathima	H2
106	Joseph	C2
110	Niktha	S1
132	Vivek	C1
154	Nevin	C1
102	Rahul	C2
105	Nelson	H2
108	Bincy	S2
132	Vivek	C1
164	Rachana	S1

Intersection Operation

The Intersection operation combines the common rows from two tables and forms a new relation.

It is denoted by the symbol ∩

The Intersection operation is valid only when the two relations are in union compatible.

Syntax : Relation1 ∩ Relation2

Example Intersection

Arts

AdmNo	Name	BatchCode
101	Sachin	S2
103	Fathima	H2
106	Joseph	C2
110	Niktha	S1
132	Vivek	C1
154	Nevin	C1

Sports

AdmNo	Name	BatchCode
102	Rahul	C2
103	Fathima	H2
105	Nelson	H2
106	Joseph	C2
108	Bincy	S2
132	Vivek	C1
164	Rachana	S1

Example Intersection

Details students who participated in both arts and sports

- **Arts ∩ Sports**

AdmNo	Name	BatchCode
103	Fathima	H2
106	Joseph	C2
132	Vivek	C1

Table. 8.13: Relation of ARTS SPORTS

Set Difference Operation

The Set difference operation find tuple that are in one relation but are not in another relation.

It is denoted by the symbol -.

The union operation is valid only when the two relations are in union compatible.

Syntax : Relation1 - Relation2

Example set difference

Details students who participated in arts but not in sports

Arts - Sports

AdmNo	Name	BatchCode
101	Sachin	S2
110	Nikitha	S1
154	Nevin	C1

Table. 8.14: Relation of ARTS - SPORTS

Example set difference

Details students who participated in sports but not in arts

Sports - Arts

AdmNo	Name	BatchCode
101	Rahul	C2
105	Nelson	H2
108	Bincy	S2
164	Rachana	S1

Table. 8.15: Relation of SPORTS - ARTS

Cartesian Product

The Cartesian Product operation combines tuples from two relations. It is denoted by the symbol X.

Syntax : Relation1 X Relation2

If Relation1 has m rows and Relation2 has n rows then Relation1 X Relation2 has m x n rows

Cartesian Product Example

Studen

AdmNo	Roll	Name	Batch	Marks	Result
101	24	Sachin	Science	480	EHS
102	14	Rahul	Commerce	410	EHS
103	4	Fathima	Humanities	200	NHS
104	12	Mahesh	Commerce	180	NHS
105	24	Nelson	Humanities	385	EHS
106	8	Joseph	Commerce	350	EHS
107	24	Shaji	Humanities	205	NHS
108	2	Bincy	Science	300	EHS

Teacher

TeacherId	Name	Dept
1001	Viswesaran	English
1002	Meenakshi	Computer

Cartesian Product Example

Student X Teacher

AdmNo	Roll	Name	Batch Code	Marks	Result	TeacherId	Name	Dept
101	24	Sachin	S2	480	EHS	1001	Viswesaran	English
101	24	Sachin	S2	480	EHS	1002	Meenakshi	Computer
102	14	Rahul	C2	410	EHS	1001	Viswesaran	English
102	14	Rahul	C2	410	EHS	1002	Meenakshi	Computer
103	4	Fathima	H2	200	NHS	1001	Viswesaran	English
103	4	Fathima	H2	200	NHS	1002	Meenakshi	Computer
104	12	Mahesh	C2	180	NHS	1001	Viswesaran	English
104	12	Mahesh	C2	180	NHS	1002	Meenakshi	Computer
105	24	Nelson	H2	385	EHS	1001	Viswesaran	English
105	24	Nelson	H2	385	EHS	1002	Meenakshi	Computer
106	8	Joseph	C2	350	EHS	1001	Viswesaran	English
106	8	Joseph	C2	350	EHS	1002	Meenakshi	Computer
107	24	Shaji	H2	205	NHS	1001	Viswesaran	English
107	24	Shaji	H2	205	NHS	1002	Meenakshi	Computer
108	2	Bincy	S2	300	EHS	1001	Viswesaran	English
108	2	Bincy	S2	300	EHS	1002	Meenakshi	Computer

END

Previous Questions

- 1. Explain any three advantages of DBMS
- 2. What is relational algebra ?Explain any three relational algebra operations.
- 3. The number of attributes in a relation is called .....
  (a) tuple (b) degree (c) cardinality (d) domain
- 4. Explain the components of DBMS.
- 5. Define the following
  a) Field
  b) Record

- 6. In RDBMS a relation contains 10 rows and 5 columns. What is the degree of the relation?
- 7. Explain the different levels of data abstraction in DBMS.
- 8. ..... symbol is used for select operation in relational algebra.
  a). σ b). π c). υ d).ñ
- 9. Explain advantages of DBMS over conventional file system.
- 10.Define the term Data independence. Explain different levels of data independence

- 11. Explain any three fundamental operations in relational algebra
- 12. In DBMS
  a) Explain classification of database users
  b) Define the terms -Cardinality, Schema and Alternate key
- 13. What is key? Explain any two keys in a relational database management system

Chapter 9
Structured Query Language

What is Structured Query Language (SQL) ?

- SQL is developed by Donald D. Chamberlin and Raymond F. Boyce
- It is a language designed for managing data in relational database management system (RDBMS).

What are the components of SQL?

1) **Data Definition Language(DDL):** DDL is a component of SQL that provides commands to deal with the schema(Structure) of a database. DDL commands are used to create, modify and remove database objects like tables, views and keys. The common DDL commands are CREATE, ALTER and DROP.
2) **Data Manipulation Language(DML) :** DML is a component of SQL used to enhances efficient user interaction with Data Base System by a set of commands. It permits users to insert, delete and retrieve data from a database. The common DML commands are SELECT, INSERT, UPDATE and DELETE.
3) **Data Control Language(DCL) :** DCL is used to control access to database. It is used to control administrative privileges in a database. The common DCL commands are GRANT and REVOKE.

What are the use of GRANT and REVOKE commands?

- **GRANT** : Allows access privileges to the users to the database
- **REVOKE**: Withdraws user's access privileges given by GRANT

What are the data types of MySQL?

- Data type specifies the type of value that can be entered in a column in a table. It ensures the correctness of data.
- Data types in SQL are classified into three,

1)Numeric data type (INT, DEC)

2)String data type (CHAR, VARCHAR)

3)Date and time data type.

1) Numeric data type

- a). **INT or INTEGERS** : They are whole numbers ie, without fractional part. They can be positive, negative or zero.
- b). **DEC or DECIMAL**: They are numbers with fraction. The syntax is DEC (Size, D) where Size is the total number of digits and D is the number of digits after the decimal point.

2) String Data Type

- A string is a group of characters
- a) **CHAR or CHARACTER** : Character includes letters, digits, special symbols etc. It is a fixed length data type. Syntax: CHAR (Size)
- b) **VARCHAR** : The VARCHAR data type represent variable length strings. It is similar to CHAR, but the space allocated for the data depends only on the actual size of the string

3) Date and Time data type

- a)**Date:**-The date data type is used for storing date. The date in MySQL is represented in YYYY-MM-DD format(Standard format).
- b)**Time**:-The time data type is used for storing time. The format is HH:MM:SS.

What are constraints?

- Constraints are rules applied on data entered into the column of a table.
- There are two types of constraints

1)Column Constraints

2)Table Constraints

Column constraints :

- These are applied only to individual columns. They are written immediately after the column.
- 1) **NOT NULL**:- This constraint ensures that a column can never have NULL(empty) values.
- 2) **AUTO_INCREMENT**:-The AUTO_INCREMENT keyword perform an auto increment ie, it automatically assigns a series of number automatically and insert it to column.
- 3) **UNIQUE**:- This constraint ensures that no two rows have the same value in a specified column. This constraint can be applied to those columns that have been declared NOT NULL.
- 4) **PRIMARY KEY**:- It declares a column as the primary key of a table. This column must not have null values and every value should be unique.
- 5) **DEFAULT:**- This constraint is used to specify a default value for a column.

Table Constraints :

- A table constraint can applied to an individual column or group of columns .
- **1. CHECK**:-This constraint limits the values that can be inserted into a column of a table.
- **2. UNIQUE** constraint is an integrity constraint that ensures values in a column or group of columns to be unique.

END

How to create a Database ?

1)Applications → Programming → MySQL

2)When asked for password, press enter button

3)Command to create Database:
CREATE DATABASE <database_name>;

4)Command to open Database:
USE <database_name>;

How to create a table?

- CREATE Command:

  The CREATE TABLE Command is used to create a table(relation).

- The syntax is :
  CREATE TABLE <TableName> (<ColumnName1> <DataType> [<Constraints>] , <ColumnName2> <DataType>
  [<Constraints>] ,.....);

CREATE TABLE STUDENT(ROLLNO INT PRIMARY KEY, NAME VARCHAR(20), COURSE VARCHAR(20), TOTAL_MARK INT);

ROLL NO	NAME	COURSE	TOTAL_MARK

Relation (Table)

How to insert values in to a table

- This command is used to insert a row (tuple) into a table.
- Syntax :
  INSERT INTO <TABLENAME> VALUES(<Value1>,<Value2>,....);
- Eg:
-

  INSERT INTO STUDENT VALUES (1,'ANISH','COMMERCE',599);

How to view the contents of a Database

- The SELECT Command is used to select rows (tuples or records) from a table.
- The Syntax :

  SELECT <ColumnName1>,[<ColumnName2>,....]
  FROM <Table Name> ;
- Eg:-

  SELECT ROLLNO,NAME,TOTAL_MARK FROM STUDENT;

SELECT is used along with many other commands:

- i) **The DISTINCT Keyword** : It is used to avoid duplicate rows from the result of a select command. Eg:
  SELECT DISTINCT NAME FROM STUDENT;

- ii) **ALL** :The keyword ALL is used to display duplicate rows in a select command. Eg:
  SELECT ALL NAME FROM STUDENT;

- iii) **WHERE Clause** : The WHERE clause is used to select rows or columns from a table which satisfy a specific condition. The condition can be expressed using Relational operators or Logical operators.
- Eg:
- SELECT NAME, COURSE FROM STUDENT WHERE TOTAL_MARK>500;

- iv) **BETWEEN ..... AND Operator** : It is used to specify a range .
  Eg:-
  SELECT * FROM STUDENT WHERE ROLLNO BETWEEN 10 AND 25;
- v)**LIKE** : The LIKE keyword is used to search for a specified pattern in a column. Eg:
  SELECT * FROM STUDENT WHERE NAME LIKE 'M%';
- vi) **IN Operator:** It is used for setting a condition satisfying any list of values. Eg:-
  SELECT * FROM STUDENT WHERE COURSE IN('COMMERCE', 'HUMANITIES');

- vii) **IS NULL Operator**: This Operator in a WHERE clause to find rows containing a null value in a particular column.
  Eg :
  SELECT * FROM STUDENT WHERE ROLLNO IS NULL ;
  Display details of students whose roll no is not specified.
- viii) **ORDER BY Clause**: The ORDER BY clause is used to sort the result of a select statement in ascending (ASC) or descending(DESC) order. The default order is ascending.
- Eg :

  SELECT * FROM STUDENT ORDER BY NAME ASC;

- ix) **COUNT (*) Function**: COUNT() function used to find the number of rows that matches a specified condition. It can used with DISTINCT command to avoid duplicate rows. EG:

```
SELECT COUNT(*) FROM STUDENT WHERE COURSE="COMMERCE";
```

- x) **GROUP BY Clause** : The GROUP BY clause is used to group the rows of a table based on a common value.
  Eg:-
  SELECT COURSE, COUNT(*) FROM STUDENT GROUP BY COURSE;
  Display each Course and Number of Students in each Course.

Other Useful Commands

- Command to show the available Databases:
  SHOW DATABASES;
- Command to show the available tables in a Database:
  SHOW TABLES;
- Command to show the structure of a table in a Database:
  DESC <table name>;

Q) What are the rules in naming Tables and Columns in MySQL?

1) The name must not be an SQL keyword.
2) The name may contain alphabets, digits, under score(_) and dollar ($) sign.
3) The name must contain at least one character.
4) The name should not be duplicate with the names of other tables in the same data base
5) The name of the table must not contain white space, special symbols.

END

How to alter a Table

- The ALTER TABLE Command is used to add new column, modify existing column, drop column or renaming a table.
- The alter command is used with commands:

I. ADD
II. MODIFY
III. DROP
IV. RENAME

I) The ALTER TABLE Command with ADD keyword is used to add columns .

Eg:

```
ALTER TABLE STUDENT ADD (PERCENTAGE DEC(5,2) );
```

II) ALTER TABLE Command with MODIFY keyword is used to modify an existing column

Eg:

```
ALTER TABLE STUDENT MODIFY (PERCENTAGE DEC(6,3));
```

III) ALTER TABLE Command with DROP keyword used to remove a column from a table.

Eg:-

```
ALTER TABLE STUDENT DROP TOTAL_MARK ;
```

IV) ALTER TABLE Command with RENAME TO keyword used to rename an existing table

Eg:-

```
ALTER TABLE STUDENT RENAME TO STUDENT1;
```

How to update the data in a table

- **UPDATE** command is Used to change the values in a column of specified rows.
- The rows are set to new values using the SET keyword.
- Eg:

```
UPDATE STUDENT SET ROLLNO=1111 WHERE NAME='ANISH';
```

How to Delete or remove data from table

- DELETE command is used to remove individual rows from a table
- Syntax:

```
DELETE FROM <Table_Name> [ WHERE <condition>] ;
```

- Eg.

```
DELETE FROM STUDENT WHERE ROLLNO=1111;
```

END

How to delete and table and database

- DROP command
  It is used to permanently removes table from the database. Syntax:
- DROP TABLE <Table Name> ;
- Eg:- DROP TABLE STUDENT;

- DROP DATABASE PANANGAD;

END

Aggregate Functions

- The aggregate functions acts on a group of data and returns a single data. They are also called summary functions.
- Commonly used aggregate functions are:

Function	Return value
SUM()	Total of the values in the column specified as argument.
AVG()	Average of the values in the column specified as argument.
MIN()	Smallest value in the column specified as argument.
MAX()	Largest of the values in the column specified as argument.
COUNT()	Number of non NULL values in the column specified as argument.

Table 9.7: Some built-in functions of MySQL

- EG:

```
SELECT AVG(TOTAL_MARK) FROM STUDENT;

SELECT MIN(TOTAL_MARK) FROM STUDENT;
SELECT MAX(TOTAL_MARK) FROM STUDENT;

SELECT COUNT(TOTAL_MARK) FROM STUDENT;

SELECT SUM(TOTAL_MARK) FROM STUDENT;
```

Q) What is Nested Query?

- A Nested query is a query placed within another SQL query.
- The inner query is known as the sub query and the query that contains the sub query is known outer query.
- Eg:

```
SELECT Regno, Name FROM Student
WHERE Score=(SELECT MAX(Score) FROM
Student);
```

END

What is VIEW ?

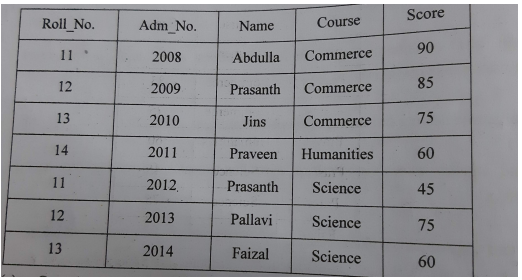
- A view is a virtual table which is derived from one or more tables. The Tables from which tuples are collected to create a view is known as Base Table.
- View can be created using the DDL Command CREATE VIEW. All the DDL commands can be used in a view.
- Eg: CREATE VIEW COMMERCE_STUDENTS AS SELECT * FROM STUDENT WHERE COURSE='COMMERCE';
- This command will show the contents of the view:
  SELECT * FROM COMMERCE_STUDENTS;
- DROP VIEW Command is used to remove a view.
- EG:
- DROP VIEW COMMERCE_STUDENTS;

What are the advantages of VIEW ?

- **Advantages of View are:**
- a). Views allows to setup different security levels for a table.
- b). Views allows to see the same data in a different way.
- c). It helps to hide complexity.

END

Previous Question



Roll_No.	Adm_No.	Name	Course	Score
11	2008	Abdulla	Commerce	90
12	2009	Prasanth	Commerce	85
13	2010	Jins	Commerce	75
14	2011	Praveen	Humanities	60
11	2012	Prasanth	Science	45
12	2013	Pallavi	Science	75
13	2014	Faizal	Science	60

- 1. Consider the following table student
- a) Can you suggest an attribute that can be selected as primary key? Justify your answer?
- b) Write SQL query to change the course attribute value ‘Humanities’ of the student Praveen to ‘Commerce’
- c) Write SQL query to display the name and score of all the students who scored greater than 60
- d) Write SQL query to remove the details of students who scored less than 50

Answer

- 1
- a) Adm_No can be used as primary key because it uniquely identify the tuples
- b) update student set course=’commerce’ where name=’Praveen’;
- c) select name,score from student where score>60;
- d) delete from student where score<50;

Previous Question

- 2. Consider the table student with attribute admno, Name, course, percentage. Write the SQL statement to do the following
- i) Display all the student details
- ii) Modify the course ‘Commerce’ to ‘Science’
- iii) Remove the student details with percentage below 35
- iv) Create a view from the above table with percentage greater than 90

Answer

- 2
- i) select * from student;
- ii) update student set course=’science’ where course=’commerce’;
- iii) delete from student where percentage<35;
- iv) create view stdview as select * from student where percentage>90;

Previous Questions

- 3. Define view in SQL and write the syntax of the command used to create a view
- 4. Write the names of any two column constraints and their usage
- 5. Define the following
  a) DML
  b) DDL
  c) DCL
- 6. Write the result of the following
  a) ALTER TABLE <table name> Drop <column name>
  b) DELETE * FROM <table name>
  c) DROP TABLE <table name>

Chapter 10
Enterprise Resource Planning

What is an Enterprise?

- An Enterprise is a group of people and other resources working together to achieve a common goal.
- An Enterprise consists of different departments with their own duties and responsibilities(Eg. Marketing, Sales, Finance etc.) and different types of resources(Eg. Money, Manpower, and Machinery etc).

What is the use of Enterprise Resource Planning (ERP) ?

- Sharing of Information using a central database
- For better efficiency each department must communicate to other depts.. **ERP combines all the requirements of a company and integrated to a central database so that various departments can share information**

What are the Functional Units of ERP?

1) **Financial Module:** This module collects financial data from various department and generate various reports like Balance sheet, Trial balance, General ledger etc.
2) **Manufacturing Module:** This module manages and provides information for the entire production process
3) **Production Planning Module:** This module is used for the utilization of resources in an optimized way so as to Maximize the production and minimize the loss. Optimization means to use resources effectively for the production.
4) **HR Module:** HR module maintain an updated and complete employee details database which consists of information like personal details, salary details, attendance and promotion.
5) **Inventory Control module**: This Module manages the stock requirement for an organization.
6) **Purchasing Module:** This module is responsible for the availability of raw material in the right time at the right price. This module generates purchase orders for the suppliers, billing etc. Marketing Module: This module is used for monitoring customer orders, increasing customer satisfaction, eliminating credit risks etc...
7) **Sales and Distribution Module:** This module manages the sales and distribution activities. This module includes inquiries, order placement etc.. This module integrates with e-commerce web site.
8) **Quality Management Module:** This Module deals with Quality Planning, Quality Inspection and Quality Control.

What is Business Process Re engineering (BPR)

- It is the analysis and redesign of workflow with in an enterprise. Reengineering may result in efficient time management, reduced cost, and effective utilization of resources.
- Business Process consists of 3 elements:

1) **Inputs**-I/p data for Processing like Data, Materials etc.
2) **Processing**- A set of activities to produce an o/p
3) **Outcome**- The output of processing.

- The different phases of BPR:
- a). Identification of business process,
- b). Analysis of current business process
- c). Designing a revised process
- d).Implementing a revised process.

What is the Connection between ERP and BPR ?

- Before implementing ERP we need to conduct a BPR to determine the changes in the structure of business process. This helps to an enterprise to avoid unnecessary modules in ERP.

ERP solution Providers/ERP Packages

a) **Oracle**- Head quarters at Redwood shores, California, USA.. It also provide Customer Relationship Management(CRM) software and Supply Chain management software(SCM).

b) **SAP-** Stands for Systems Applications and Products. It is German Company. They develop ERP solutions for both small and large organizations. It also provide Customer Relationship Management(CRM) , Supply Chain management(SCM) and Product Life Cycle Management(PLCM) software etc.

c) **Odoo-** It is an open source ERP. It can be customized based the requirements of organization. It was formerly known as Open ERP.

d) **Microsoft Dynamics**- US company with head quarters at Redmond, Washington. Provides ERP package to mid sized organization. It can be installed and used easily with good user interface. They also provide CRM software.

e) **Tally ERP**- Indian Company with head Quarters at Bangalore Provide ERP solution for accounting, inventory and payroll.

Implementation Of ERP

1) **Pre evaluation screening** – By selecting appropriate modules from those available in the market, we can limit the number of modules to be evaluated.

2) **Package Selection**- An ERP system needs huge investments, once a package is selected ,it is not easy to switch on to another package. So the package selection will decide the success and failure of the project.

3) **Project Planning**- In this stage the implementation of process is planned and designed. The time schedule, roles and responsibilities of various persons etc are identified and assigned..

4) **Gap Analysis**- There is not a single complete ERP package available for meeting all the requirements of an organization. Even the best ERP can meet 80% of needs of an organization. So the Gap should be analysed and considered for the following phases.

5) **Business Process Re-engineering(BPR)**- Re-engineering may result in efficient time management, reduced cost, and effective utilization of resources. It is the analysis and redesign of workflow with in an enterprise.

Implementation Of ERP

6) **Installation and Configuration-** This is the main functional phase of ERP. Before installing a new ERP package the whole process of the enterprise should be analysed in detail. Instead of replacing the old system with new ERP system ,a prototype of the actual ERP is develop and testing of the prototype is done to find its weakness.

7) **Implementation and Team Training-** This is the phase where the company trains its employees to implement and works on the system. The company should select appropriate employees with right attitude, willingness to change and learn new things and who are not afraid of technology.

8) **System Testing-** The software is tested to ensure that it works properly

9) **Going live-** This is the phase where ERP is made available to the entire organization. After Configuring, Testing and Removing errors, the system become live to perform its operations.

10) **End User Training-**This is the phase where the actual users of the ERP system need to be trained. The employees need to be trained based on their skills to use the new system.

11) **Post Implementation-** This the phase where we checked whether the objectives set for the ERP system has met.

What are the benefits of ERP System?

1) **Improved resource utilization:** reduce the wastage of resources and improve resource utilization
2) **Better Customer Satisfaction:** customer can place orders and make payments from home.
3) **Provides Accurate Information:**
4) **Decision Making Capability:**- Accurate and relevant information helps to make better decisions for a system.
5) **Increased Flexibility:**-ERP system can adapt new changes easily.
6) **Information Integrity:**- information about enterprise is stored in central database. **high security, business intelligence unified reporting system, high speed delivery of product or services etc. ..**

What are the Risks of ERP implementation ?

1) **High Cost:**-The cost of Implementation of ERP is high. The cost of various modules and license fees are high.
2) **Time Consuming:**-it may take months to years for the complete installation of ERP.
3) **Requirement of additional trained staff:**- trained and experienced persons are necessary.
4) **Operational and Maintenance issues:**- Implementation of ERP needs major changes in the current process of an enterprise.

ERP related technologies

1) **Product Life Cycle Management (PLM)**
2) **Customer Relationship Management (CRM)**
3) **Management Information System (MIS)**
4) **Supply Chain Management (SCM)**
5) **Decision Support System (DSS)**

1) Product Life Cycle Management (PLM):

- PLM is the process of managing the entire life cycle of a product.
- A product has 4 stages:

1) **It's introduction,**
2) **It's Growth in the market**
3) **It's Maturity**
4) **It's decline.**

- PLM is used for increasing quality of product, increasing marketing opportunities, and for use of latest technology

2) Customer Relationship Management (CRM):

- It covers the policies used by the enterprise to manage their relationship with customers. It includes capture, storage and analysis of customer information.

3) Management Information System (MIS)

- Information system collects, stores and distributes information from an organization. It is also used for decision making, communication, coordination, control and analysis of an enterprise.
- Information system transforms raw data into a useful information.
- All categories of employees like clerks, assistants, officers and managers uses MIS.

4) Supply Chain Management (SCM)

- It consists of all activities associated with moving goods from the supplier to the customer.
- It begin with collecting raw material and ends with delivering goods to customer.
- SCM aim to fast delivery of goods to customers thus increase the customer satisfaction.

5) Decision Support System (DSS)

- It is a computer program that analysis business data and present it so that users can make business decisions more easily.
- It provides information in the form of various reports with the help of DBMS.

Previous Questions

- 1. ..... is an open source ERP
- 2. Write short note on Management Information System
- 3. Explain the benefits of ERP system
- 4. Expand MIS
- 5. How Business Process Re-Engineering is related to Enterprise Resource Planning (ERP) ?

- 6. Explain the merits of ERP system
- 7. Define BPR
- 8. Define the following ERP related technologies
  (a) CRM
  (b) SCM
- 9. Write short note on SAP

Chapter 11
Trends and Issues in ICT

- **1. What is ICT ?**
- **ANS**: Information and Communication Technology
- **2. What is Mobile Computing?**
- Mobile computing is a technology that has computing capacity and can transmit/receive data while in move.
- It requires portable computing devices like laptops, tablets, smart phones etc, wireless communication networks and connectivity to the internet.

Explain the generations in Mobile Communication?

- There are five generations of Mobile communication.
- They are:

1)First Generation Networks

2)Second Generation Networks

3)Third Generation Networks

4)Fourth Generation Networks

5)Fifth Generation Networks

1) First Generation Networks

- Developed around 1980.
- 1G mobile phones were based on the analog system and provided basic voice facility only.

2) Second Generation Networks

- Use digital communication. Good quality audio, greater phone coverage. Data and MMS
- **1. GSM(Global System for Mobiles):**
- Frequency: 900MHz to 1800MHz.
- SIM (Subscriber Identity Module).
- GPRS (General Packet Radio Services): It is packet oriented data service.It has improved, voice quality short access time and higher data rate.
- EDGE (Enhanced Data rates for GSM Evolution) : It is a digital technology. It's data rate is 3 times faster than GPRS.
- **2.CDMA(Code Division Multiple Access):**-Using CDMA several transmitters can send information simultaneously over a single communication channel. It provides better coverage, better voice quality, high security than GSM.

3) Third Generation Networks

- 3G wireless network offers high data rate than 2G. 3G is also called wireless broadband.
- It can send voice, data, multimedia information using portable devices like mobile phones.
- 3G use **WCDMA** (wide Band Code Division Multiple Access) technology).

4) Fourth Generation Networks

- 4G network is also called **L.T.E** (Long Term Evolution).
- 4G network provides high speed and good quality images and videos.
- 4G use **OFDMA**(Orthogonal Frequency Division Multiplexing).

5) Fifth Generation Networks

- It will offer faster, more number of connections, more energy-efficient and cost- effective data communication than its predecessors.

END

What are the different mobile communication services?

- The different mobile communication services are:

1)**Short Message Service (SMS)**

2)**Multimedia Message Service (MMS)**

3)**Global Positioning System (GPS)**

4)**Smart Cards**

1) Short Message Service (SMS)

- It is a text messaging service used in mobile devices to exchange short messages.GSM system allows to send 160 characters.
- When a message is sent it reaches a SMSC(Short Message Service Center) which stores and forward messages to recipients.

2) Multimedia Message Service (MMS)

- MMS allows user to exchange multimedia contents over mobile devices.
- An MMS server is responsible for storing and handling the incoming and outgoing MMS.

3) Global Positioning System (GPS)

- GPS is a satellite based navigation system that is used to locate a geographical position anywhere on earth using longitude and latitude.
- It is designed by US Dept Of Defence .
- It consists of satellites, control and monitoring stations and receivers.
- It also used in vehicles, airplanes, farming etc..

4) **Smart Cards**

- A smart card is a plastic card embedded with a computer chip/memory to stores and transacts data.
- The advantage of using smart card is that it is secure, intelligent and convenient.
- eg. RSBY card, mobile phones SIM, credit cards, ATM cards etc.

What is Mobile Operating System?

- It is the operating system used in a mobile device (smart phone, tablet, etc.),
- It manages the hardware, multimedia functions, Internet connectivity, etc. in a mobile device.
- Popular mobile operating systems are Android from Google, iOS from Apple, BlackBerry OS from BlackBerry and Windows Phone from Microsoft.

END

What is Android OS?

- It was developed by Android Inc. by Andy Rubin.
- Now it is a subsidiary of Google.
- The user interface of Android is based on touch inputs like dragging, swapping, tapping, pinching etc.
- Android uses Linux kernel as it has a powerful memory management and process management system.
- An Application Development Kit is available for the developers to develop applications called ‘apps’.
- Apps are developed using Java programming language.

END

What is big data analytics ?

- **Big Data Analytics**: It is the process of examining large data set containing a variety of data type to uncover hidden patterns, market trends, customer preferences and other useful information. Data may be collected from social media etc.

END

What is Business Logistics?

- Business Logistics is the management of the flow of goods/resources (items like food, products, animals etc) in a business between the point of origin and to the point of consumption.
- The objectives of business logistics is to ensure the availability of the right product, in the right quantity ant the right place and time for right customer at right cost.
- Business logistics include,

1) **Purchase of material from a supplier**
2) **Transportation of those materials to the company’s production facilities**
3) **Movement of finished goods through warehouse and transportation channels to customers.**

What is RFID?

- RFID(radio Frequency Identification) technology can be used to identify, track or detect a wide variety of objects in logistics.
- RFID Hardware consists of tag and reader. The tag contain a microchip for storing data and an antenna for sending and receiving data. These tags can be inserted or pasted on product containers or products.

END

- **Q) What is Intellectual Property?**
- Many people are engaged in creative work like music, literary work, artistic work, discoveries, inventions, designs and software development. The outcome of such work is called **intellectual property**.
- **Q) What is Intellectual Property Rights?**
- **Intellectual Property Rights (IPR)** refers to the exclusive right given to a person over the creation of his/her mind, for a period of time.

- Intellectual property is divided into two categories:

1) **Industrial property**

2) **Copyright**

1. Industrial property: Industrial Property Right applies to industry, commerce and agricultural products. It protects Patents to inventions, trademarks, industrial designs and geographical indications.

2. Copyright: It is a legal right given to the creators for their intellectual works. Copyright applies to books, music, painting, sculpture, films, advertisement and computer software.

Industrial Property

- a).**Patents:** It is the exclusive rights granted for an invention. With Patent Protection, the invention cannot be commercially made, used or sold without the patent owners consent.The term for every patent in India is 20 yrs. After this period the invention can be used by public freely.
- b)**Trademark**: It is a distinctive sign (logo, symbol, name etc)to identify certain goods or products or services provided by an individual or a company. A trademark must be registered an is limited to that country. The initial term for registration is 10 years there after it can be renewed.

- c). **Industrial Design**: An industrial design refers to the ornamental or aesthetic aspects of an article. A design may consists of 3D features like shape, surface or 2D features like patterns, lines or colour.
- d). **Geographical Indications**: Geographical indications are signs used on goods having a specific geographic origin and posses qualities due to that place of origin. Place of origin may be a village, town or a country. Eg. Palakkadan Matta Rice, Aranmula Kannadi

END

What is Intellectual Property Infringement ?

- Unauthorized use of intellectual property right such as patents, trademark, copyrights etc are called Intellectual Property Infringement.
- It may be a violation of civil or criminal law according to the law of the country.

1) **Patent Infringement** is caused by selling a patented invention without permission from the patent holder.

2) **Trademark infringement** occurs when one party uses a trademark that is identical to a trademark owned by other party.

3) **Copyright infringement** is the reproducing, displaying or broadcasting a work without permission from the copyright holder. It is also called Piracy. Eg: Software Piracy , video piracy etc

END

What is Cyber space ?

- It is a virtual environment created by computers systems connected to internet. Internet is often referred to as cyber space.

END

What is Cyber crime ?

- Cyber crime is defines as a criminal activity in which computers or computer networks are used as a tool, target or a place of criminal activity.
- Cyber Crimes are basically divided into 3 categories,

1) **Cyber crimes against individuals**

2) **Cyber crime against property**

3) **Cyber crime against Government**

1) Cyber Crime against Individuals :

- It is defined as an act in cyberspace against a person which cause physical or mental trouble to the person.
- Cyber crime against individuals are classified into:
- a). **Identity Theft**: Here a person uses another person's identifying information like their name, user id, credit card no etc without their permission to commit fraud activities. It is form of stealing personal identity to pretend someone is someone else.
- b). **Harassment:** Posting indecent/vulgar comments focusing on gender, race, religion, nationality at specific individuals in chat rooms, social media, email etc is Harassment. The use of internet to harass someone is called cyber stalking. It can destroy friendships, careers, self image and confidence.
- c) **Impersonation and Cheating**: Impersonation is the act of pretending to be another persons for the purpose of harming the victim. Eg. Sending fake e-mails seeking help for transferring huge amount of money from a distant.
- d). **Violation of Privacy**: It is the intrusion into the personal life of another without a valid reason. It consists of distributing private information like personal data, photographs, workplace monitoring videos etc in social media sites.
- e). **Dissemination of Obscene Material**: This may include displaying prohibited material on websites, use of computers for producing obscene materials, downloading obscene materials etc.

2) Cyber Crimes against Property

- Cyber Crime against property includes all forms of property like credit cards, intellectual property etc.
- These crimes include hacking, piracy, intrusion, possession of others information etc.
- Some classifications of cyber crime are,
- a). **Credit card fraud:** It involves unauthorized usage of another person's credit card information for the purpose of payments for purchases, or transferring funds etc.
- b). **Intellectual Property Theft**: Intellectual property theft include violation of copyright, patent, trademark etc. Copying of another person's language, thoughts, ideas and presenting them as one's own original work is called Plagiarism.
- c). **Internet Time Theft**: The usage of the internet time by persons without the permission of the owner is called internet time theft.

3) Cyber Crime against Government:

- This include the cyber attacks against Govt. Sites/ computer networks in govt. organization.
- The different types of cyber attacks includes,
- a). **Cyber Terrorism**: It is a Cyber attack against sensitive computer networks like nuclear power plants, air traffic controls, gas line controls, telecom etc.
- b). **Website Defacement**: Defacement of websites include hacking of govt. websites and posting offensive comments about govt. in those websites.
- c). **Attacks Against e-governance Website**: This types of attacks include Denial of Service and DDoS (Distributed Denial of Service) attacks

END

What is Cyber Ethics?

- While engage in Cyber Space we should ensure that our actions do not harm others. For this we should follow some ethics.

1) Use anti-virus, firewall, and spam blocking software for your PC.
2) Ensure security of websites (https and padlock) while conducting online cash transactions.
3) Do not respond or act on e-mails sent from unknown sources.
4) Use unique and complex passwords for accounts and change your passwords on a regular basis. (Should have a minimum of 8 characters, contain alphabets, numbers and special characters)
5) Do not select the check boxes or click OK button before reading the contents of any agreement/message.
6) Avoid the use of unauthorised software.
7) Do not hide your identity and fool others.
8) Do not use bad or rude language in social media and e-mails.
9) Remove the check mark against 'Remember me' before logging into your account using computers other than your personal ones.

END

What is Cyber law ?

- Cyber law refers is the law governing the use of computers and internet.
- India's Information Technology Act 2000 (Amended in 2008) regulate the use of computer, servers, computer networks, data and information in electronic format.
- It give legal acceptance for electronic communication.
- Violations are treated as serious crimes and offenders are liable to penal actions.

END

What is Cyber forensics ?

- Forensics is the process of using scientific knowledge for identifying, collecting, preserving, analysing and presenting evidence to the courts.

END

What is Infomania ?

- It is the addiction of people to social media and internet based communication for acquiring knowledge.
- Now it is considered as a psychological problem which leads to loss of concentration, sleep etc..

END

Previous Questions

- 1. Define the following terms:
- a) Cyber forensics
- b) Infomania
- 2. Briefly explain the application of RFID technology in the field of business logistics
- 3. Define the following terms
- a) Trademark
- b) Copyright