




Q. No. 2 (i) Input/Output: A parallelogram () is used to represent input and output operation in flowchart. It contains the word "READ" or "INPUT" along with the input variables for the input operation and "PRINT" or "OUTPUT" along with the output data for output operation.

Processing: A rectangle () is used to represent data processing in a flowchart. All the calculations appear inside this symbol such as "sum = A+B". The variables are also initialized inside this symbol such as "k=1".

Decision: A diamond shaped symbol () is used to represent decision in a flowchart. It contains a condition. If the condition is true, then the path marked YES is to be followed and if the condition is false, then path marked NO is to be followed. The words TRUE and FALSE can also be used instead of YES or NO.

Q. No. 2 (ii) Advantages of drawing flowchart:

A flowchart

illustrates the sequence of operations to be performed to solve a given problem in the form of diagram. Computer programmers draw flowcharts before writing the computer programs. Following are the advantages of drawing flowcharts:-

- ① Once a flowchart is drawn, it becomes very easy to write a program in any high level language.
- ② Flowcharts are useful in communicating the problem-solving method to other people.
- ③ Flowcharts also help in finding and removing errors in the programs.

**Q. No. 2 (iii) Syntax:** It refers to the rules of the programming language according to which statements of a program are to be written. It describes the way to write correct statements in a program.

**Example:** An assignment statement consists of a variable and an expression separated by an equal sign as an assignment operator. This is the syntax of an assignment statement and it can be expressed as given below:

**Variable = expression;**

**Semantic:** Semantic gives meaning to the statements of the program. It describes the ~~set of~~ sequence of operations that are to be performed by the computer while executing the statements of a computer program.

**Example:** In the assignment statement given below:

**sum = a + b;**

The semantic of the statement is to perform the expression i.e. to add the values stored in variables "a" and "b" and to store the result in the variable "sum".

**Q. No. 2 (iv) Low Level Languages**

- ① Low Level Languages are machine oriented languages.
- ② They are associated with architecture of a computer.
- ③ They include machine language and assembly language.
- ④ A program known as assembler is used to translate ~~the~~ assembly language <sup>programs</sup> (low level language) into machine language.

**High Level Languages**

- ① High level languages are english oriented languages.
- ② They are not machine dependent.
- ③ They are classified as procedural, structured and Object Oriented Programming Languages.
- ④ Compiler / Interpreter is used to translate High level language programs into machine language. Examples of High level languages are C, Java and Pascal.

## Q. No. 2 (v) Else-if

① If any condition is true, then statements under that condition are executed.

② If none of the conditions is true, then statements under "else" are executed.

③ The condition can be a relational expression such as  $(k > 1)$

## Switch

① If the result of the expression matches with any case, then statements under that case are executed.

② If none of the case is matched, then statements under the "default" keyword are executed.

③ The expression can't be a relational expression. It should be of type int and char but not float.

Q. No. 2 (vi) **Conditional Statement:** It is a statement in a programming language that ~~condit~~ contains a condition. Based on the result of the evaluation of that condition, a particular statement or the set of statements are executed. Examples of conditional statements in C language are IF, If-else, if-else-if and switch statement.

**IF Statement:** It has the following syntax:-

IF (condition)

{

Block of Statements

} When this statement is executed, the condition is evaluated.

If the condition is true, then the set of statements following "If" are executed and if it is false, then the set of statements following

Q. No. 2 (vii)

```
#include <stdio.h>
void main (void)
```

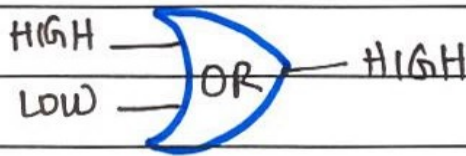
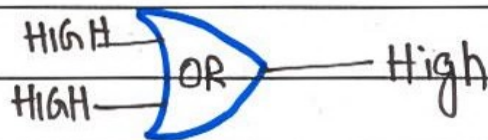
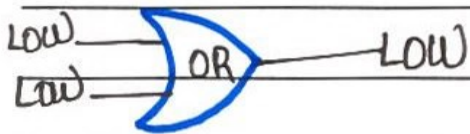
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{
    int x=1; int y=3;
    if (x+y==1)
        printf ("Sum of x and y is 1");
    else if (x+y==2)
        printf ("Sum of x and y is 2");
    else if (x+y==3)
        printf ("Sum of x and y is 3");
    else
        printf ("Sum of x and y is not equal to 3");
}
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Q. No. 2 (viii)

Q. No. 2 (ix) **Logic gate:** Logic gates are the basic building blocks of digital computers. A logic gate operates on two voltage levels and process digital signals which represents the binary digits 0 and 1. A logic gate performs a particular logical operation. It has two or more inputs (Low or High) and produces a single output (Low or High) which is determined by the logic levels present at the inputs.

⇒ All possible operations of two-input OR gate:



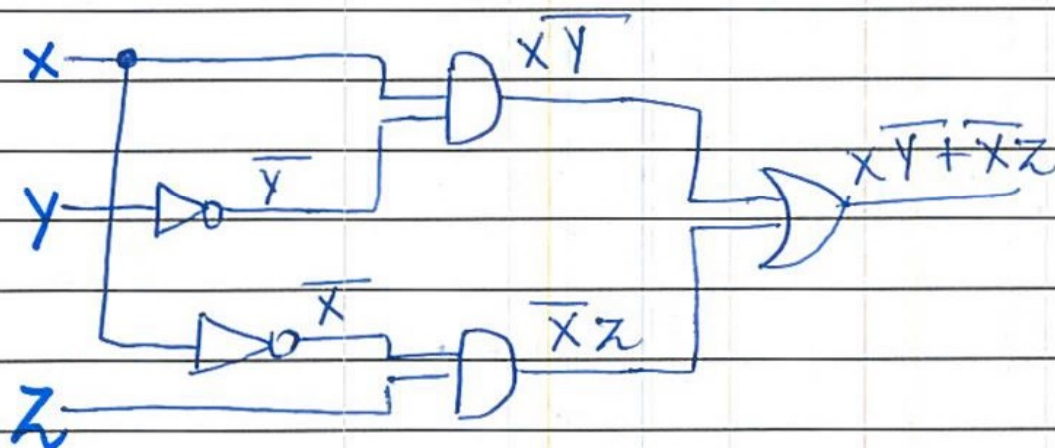
Q. No. 2 (x) **Truth table:** A truth table represents a digital logic circuit in the form of a table. It shows that how a logic circuit's output responds to all the possible combinations of inputs using Logic 1 for TRUE and Logic 0 for FALSE.

Truth table for Boolean expression  $X\bar{Z} + \bar{X}Y$

X	Y	Z	$\bar{X}$	$\bar{Y}$	$\bar{Z}$	$X\bar{Z}$	$\bar{X}Y$	$F = X\bar{Z} + \bar{X}Y$
1	1	1	0	0	0	0	0	0
1	1	0	0	0	1	1	0	1
1	0	1	0	1	0	0	0	0
1	0	0	0	1	1	1	0	1
0	1	1	1	0	0	0	0	0
0	1	0	1	0	1	0	0	0
0	0	1	1	1	0	0	1	1

Q. No. 2 (xi) Logic circuit of following Boolean expression: -

$$X\bar{Y} + \bar{X}Z$$



Q. No. 2 (xii) a) **Search engine:** A search engine is a software that helps in finding the information on web. A user types in one or more keywords in the search engine. Search engine displays ten sites that closely matched with the keywords. The websites' information contains a title and a brief description. User can see next ten sites by click "Next Result" or "next page" or a similar button at the bottom of page. User can visit any website by clicking on its hyperlink. Examples of search engines are Yahoo and Google.

b) **Homepage:** Home page is the main page of a website that displays on opening the website. The main page of a web browser is also called Home page.

c) **Web hosting:** Web hosting is a service that uploads a website on the server and make it available for the users. For web hosting, a web server and permanent internet connection is required. It also ~~is~~ requires website



Q. No. 2 (xv)

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Q. No. 3 (Page 1/4)

## Q. No. 3 (Page 1/4)

# Assignment Operator (=) and Equal to (==) operators:-

### Assignment operator (=):-

Assignment operators are used to assign the value of an expression to a variable. The basic assignment operator is " $=$ ". It is used to assign a value to a variable. It has the following general form:-

$\text{Variable} = \text{expression}.$

Where, this expression can be a constant, another variable to which value has been previously assigned or a formula to be evaluated. For example:

$\text{sum} = a + b;$

### Examples:

①  $\text{Product} = a * b;$

This statement will assign the product of the values stored in variables "a" and "b" to the variable "Product".

②  $\text{Count} = 1;$

This statement assigns a value "1" to the variable count.

Q. No. 3 (Page 2/4)

③  $k=1$ ;

This statement assigns a value of 1 to k.

## Equal to ( $==$ ) operator:-

Equal to ( $==$ ) operator is a relational operator. It is used to compare the two values of the same kind. It is used for decision making.

### Examples:-

①  $(\text{count} == 0)$

The condition will be true if count is equal to zero and it will be false if count is not equal to zero.

②  $(\text{sum} == 3)$

The condition will be true if sum is equal to 3 and will be false if sum is not equal to 3.

③  $(\text{Average} == 5)$

Similarly here, the condition will be true if Average is equal to 5 and it will be false if it is not equal to 5.

$\Rightarrow$  As a conclusion we can say that the difference between  $(=)$  and  $(==)$  operator is that this that assignment operator  $(=)$  is used to assign a value to a variable.

Q. No. 3 (Page 3/4) to compare two values of the same kind.

19) Prefix and Postfix increment and decrement operators:-

++	Increment by 1
--	decrement by 1

$++n$  and  $n++$  is same as  $n=n+1$

$--n$  and  $n--$  both are equal to  $n=n-1$

When  $++$  or  $--$  comes before a variable it is known as "prefix increment ~~or~~ decrement operator". And, when it comes after a variable, then it is called postfix increment ~~or~~ decrement operator.

In certain situations,  $++n$  and  $n++$  have different effects.  $++n$  increments  $n$  before using its value whereas  $n++$  increments  $n$  after its value is used.

For example, consider the following examples:

$a = ++n;$

Suppose if  $n$  has the value of 3. It will first increment  $n$  by 1 and then assign value 4 to  $a$ .

Q. No. 3 (Page 4/4)

$a = n++;$

It will first assign the value 3 to 'a' and then increment n.

In both cases n has the value of 4.

Similarly, consider following examples:-

$c = --n;$

Suppose n has the value of 4 it will decrement n by 1 and then assign value "3" to c.

$c = n--;$

It will first assign the value "4" to c. After, that it will decrement "n" by 1.

⇒ As a conclusion, we can say that prefix increment or decrement operator increments or decrements the variable before using its value and postfix increment or decrement operator will increment or decrement the variable after using its value.



Q. No. 4 (Page 2/4)

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Q. No. 5 (Page 1/4)

i) Web portal :- A web portal offers a large variety of services. These include online shopping malls, paying bills, stock prices, email and search engine etc. It acts as a point of access to the information on the web. For example, a school's web portal contains the information about school's historical background, uniform, curriculum, tuition fees structure, students' corner, result etc all in a unified way.

ii) Educational website :-

An educational website is developed for the educational purpose. It contains animations, slides and presentations for effective learning. The purpose of developing these things are arranged in a well-organized way. The purpose of developing the educational website is to impart knowledge to those people who want to have better understanding of a topic and want to pursue knowledge.

Examples of educational websites are [www.freeilm.com](http://www.freeilm.com), [www.topstudyworld.com](http://www.topstudyworld.com), [www.sabaq.com.pk](http://www.sabaq.com.pk) and [www.classnotes.com](http://www.classnotes.com).

Q. No. 5 (Page 2/4)

### 3) Business Website:-

A business website is developed to maintain the business relationships, and to sell goods, services and ~~product~~ commodities via internet. A business website provides services such as selling goods, supplying goods from suppliers to customers, ticket reservation and tracking the supplied goods etc. Different companies have developed their business websites to run their business in an effective way. For example, Airblue, PIA, Serena Hotel have their own business websites.

### 4) News Websites:-

News websites provide information about current events and opinions. They also allow their visitors' voice be heard. They publish news stories and ask readers to share experience and knowledge about the topic. They ask their visitors to give feedback about the topics.

Examples of news websites are [www.TheNews.com](http://www.TheNews.com), [www.geoTV.com.pk](http://www.geoTV.com.pk), [www.Nation.com.pk](http://www.Nation.com.pk), [www.PakistanTribune.com.pk](http://www.PakistanTribune.com.pk) and [www.ExpressTribune.com.pk](http://www.ExpressTribune.com.pk).



Q. No. 5 (Page 4/4)

$$\text{if } (a+b) \neq 0$$

$$a = 0$$

$$a + b = -112$$

$$b = -112$$

switch (2+1)

switch (3)

$$a + b = -112$$