

## EXERCISE

**Q1. Select the best answers for the following MCQ**

- i. If we have the statement `int *Ptr;` then to what Ptr point?**
  - a. Points to an integer type variable
  - b. Points to a character type variable
  - c. Points to a floating point type variable
  - d. None of above
  
- ii. A pointer is**
  - a. A keyword used to create variables
  - b. A variables that stores address of an instruction
  - c. A variable that stores address of another variable
  - d. All of the above
  
- iii. The operator used to get value at address stored in a pointer variable is:**
  - a. `*`
  - b. `&`
  - c. `&&`
  - d. `||`
  
- iv. The operator used to get value at address stored in a pointer variable is**  

```
Int I = 10  
Int *j = &i
```

- a. J and I are pointers to an int
  - b. J is a pointer to an int and stores address of i
  - c. J is a pointer to an int and stores address of i
  - d. J is a pointer to a pointer to and int and stores address of i.
- v. In pointers, dereference operator (\*) is used to
- a. Address the value of the pointer variable
  - b. Points to the value stored in the variable pointer by the pointer variable
  - c. Both a and b
  - d. None of the above

### Answers

i.	None of above	ii.	A variable that stores address of another variable
iii.	*	iv.	J is a pointer to an int and stores address of i
v.	None of above		

## Extensive Questions

Q2. Write answers of the following questions.

- i. What is pointer? Describe the advantages of using pointer variables

Answer

Pointer

Pointer is a powerful feature of C++ that differentiates it from other programming languages. With the help of pointer, C++ gives users the power to manipulate the data in the computer's memory directly

### Advantages of Using Pointer variable

Following are the uses of pointer variable

1. Pointers is used to access the address of the variable
2. Pointers increase the execution speed of program
3. Pointers are used for dynamic memory allocation
4. Pointers makes possible to return more than one value in functions
5. Pointers enables us to access variables that are declared outside the functions.

- ii. What is the difference between the dereference operator '\*' and reference operator '&? Explain with the help of some lines of code

### Answer

Dereference operator	Reference operator
If we want to store the value of the variable through the pointer then we need a special type of operator called dereference operator denoted by asterisk (*)	As pointers are the variables which hold the addresses of other variables, therefore while assigning addresses to them, a programme needs a special type of operator called reference of address operator that is denoted by ampersand (&) symbol. This provides address of a memory location.
<b>Example 1</b> Int n1;	<b>Example 1</b> Int c1;

N1 = (*p1);	Int * p1; C1 = 5; P1 = &c1; // p1 references c1

- iii. How pointer is initialized? Write a simple program to illustrate this concept

### Answer

#### Pointer Initialization

Assigning values to pointers at declaration time is called pointer initialization

As we know that the values of pointers are the addresses of other variables, therefore, sometimes when we declare pointers we may want to explicitly specify to which variables they will point

#### Examples

Consider the following segment of code to understand the concept of pointer initialization

```
Float temperature;
```

```
Float *Ptemperature = &Temperature;
```

Here, Ptemperature is a pointer variable to a floating point variable as this pointer is created with the statement float \*Ptemperature immediately the address of a float variable 'Temperature' is assigned to it. The behavior of the above code is being equivalent to the following code.

```
Float Temperature;
```

```
Float *Ptemperature;
```

```
Ptemperature = &Temperature;
```

It should be considered that at the moment of declaring a pointer, the asterisk (\*) indicates only that is a pointer variables and not the dereference operator.

### Program

Consider the following program to explain the concept of pointer initialization

```
/* pointer initialization program */  
  
#include <iostream.h>  
  
#include <conio.h>  
  
Int main ()  
{  
  
Float temperature;  
  
Float *Ptemperature = &temperature;  
  
Cout << "the address of temperature is = " << &temperature << Endl;  
Cout << "the value of (*Ptemperature) is = " << *Ptemperature << Endl;  
  
Getch();  
  
Return 0;  
}
```

### Output of the Program

The address of temperature is = 0\*8f98fff2

The value of Ptemperature is = 0\*8f98fff2

- iv. How the declaration of a pointer variable is different from the declaration of a simple variable?

### Answer

## Difference

Declaration of a variable	Declaration of a simple variable
The declaration of pointer is simple and is similar to the declaration of a regular variable with a minor difference of the use of an asterisk (*) symbol between the data type and the variable name	When declaring a variables by identifier (or name), the variable is synonymous with its value
<pre>Int *total marks; Char *Name; Float *percentage;</pre>	<pre>Int number = 3; Std :: cout &lt;&lt; "number is Initialized with a value of" &lt;&lt; numbers &lt;&lt; "\n" // Outputs: number is Initialize with a value of 3</pre>

## LAB ACTIVITIES

Practice all the programs given in the chapter

**Answer**

Practical work

