

Assignment - 12

Q1] What is mean by reference in C++? Explain with an example.

- Reference is newly added datatype in C++.

- the concept of reference is applicable in C++ and as well as in Java.

- Reference is consider as derived datatype.

- When we create a reference to an existing variable it is just consider as another name to that variable.

- It is just another name so that there is no separate memory allocation for reference.

To create a reference & operator (reference operator) is used.

- if the & operator is used after the assignment operator (RHS) then it is consider as address of operator = & (Address of operator)

- if the & operator is used before Assignment operator then it is consider as reference

$\&$ = Reference operator

Syntax:- int no = 11;
int noref = &no;

no [11] noref
100 104

- when we create reference variable its entry gets added inside Symbol table

- symbol table contain one column named as another name which contain the name of that reference variable

- we can create multiple reference to a variable.

Example:-

```
#include <iostream>
using namespace std;
int main()
```

```
{  
    int no = 11;  
    int & noref = no;
```

```
cout << "no : " << no << "\n";  
cout << "noref : " << noref << "\n";
```

```
return 0;
```

Q2] What is the difference between pointer and reference.

Pointer

- 1) Holds the address of a memory location
- 2) operator is *
- 3) Possible to initialize at any time
- 4) must be used when dynamically creating new data
- 5) we can initialize pointer to NULL

Reference

- 1) An alias for a variable that already exists
- 2) operator is &
- 3) must be initialized when creating it
- 4) use reference everywhere you can, pointer when you can't
- 5) we can't create array of reference initialize to NULL

(Q3) Explain different ways to call a function in C++

→ following are different ways to call a function

1) call by value:

- when method is called by value a copy of actual parameter is passed to method

- this means that changes made to the parameter inside method.

- this typically used with primitive data value such as int, char, float, void, double.

2) call by reference

- All the a method for passing arguments to a function by copying the reference of the argument to the function's formal parameter.

- the reference operator & is used to pass the address of the argument to the function

3) call by Address

- call by address in C++ is a method of passing the address of a variable to a function.

(5)

Q 4) Draw symbol table for below syntax.

int no = 10; // consider add of no as 100
 int *p = &no; // consider address of no as 200

int **q = &p; // consider address of no as 300

symbol table

Name	Address	Size	value	Data type	Ansatz name
no	100	4	10	integer	p
p	200	8	100	integer	q
q	300	8	200	integer	p

c) Draw symbol table & diagrammatic representation of below syntax.

int no=10; // consider address of no as 100

int *p = &no; // consider address of no as 200

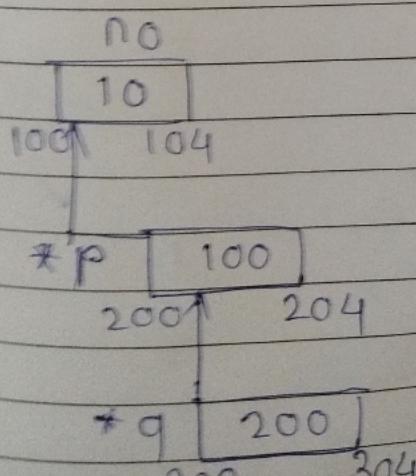
int *q = &p; // consider address of no as 300

symbol table

Name	Address	Size	value	Data type	Another name
no	100	4	10	integer	p
p	200	4	100	integer	q
q	300	4	200	integer	p

d) Draw symbol table & diag

Diagrammatic representation



Q6) Draw symbol table of diagrammatic representation of below syntax

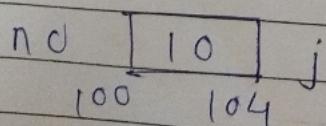
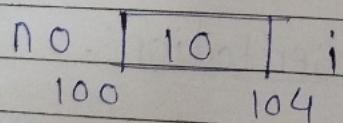
int no = 10; // consider address of no as 100.

int &i = no;
int &j = no;

Symbol table

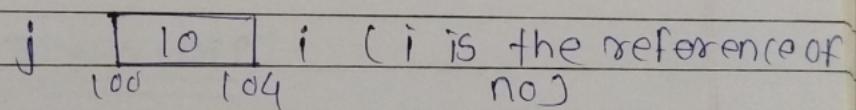
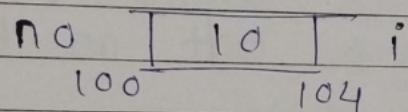
Name	Add	size	value	Data type	another name
no	100	4	10	integer	i
no	100	4	10	integer	j

Diagrammatic Representation



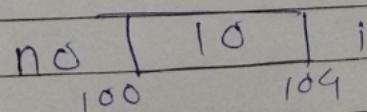
Q7] `int no=10; // consider address of no as 100`
`int f i = no;`
`int f j = i;`

name	Address	size	value	Datatype	Another name
no	100	4	10	integer	i
j	100	4	10	integer	i



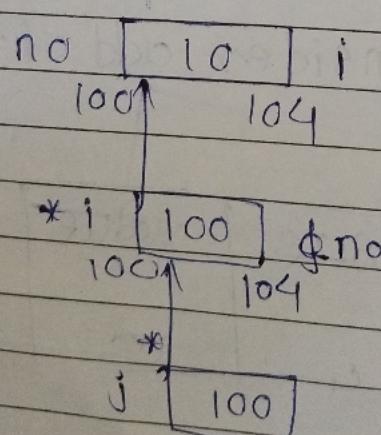
Q8] `int no=10; // consider add of no as 100`
`int f i = no;`

Name	Address	Size	Value	Datatype	Another name
no	100	4	10	integer	i



Q 9) `int no = 10; // consider add of no as 10`
`int *i = &no; // consider add of no as 100`
`int *(j) = i;`

Name	Address	Size	Value	Data type	Another name
no	100	4	10	integer	i
i	100	8	100	integer	j



(Q10) what is mean by call value by reference,
value and call by reference?

call by value

- when method is called by value
a copy of actual parameter is passed to method
- this means that changes made to the parameter inside method
- this typically used with primitive data value such as int, char, float, double, void

call by reference

- call by reference in C++ as a method for passing arguments to a function by copying the reference of the argument to the function's formal parameter.
- the reference operator & is used to pass the address of the argument to the function.