

## Assignment - 19

Q1) what is the difference between malloc() and new, free and delete?

→ The malloc() and free() are used in C programming

- malloc function is used for memory allocation in C
- free() function is used for memory deallocation in C

- new operator is used in C++ for memory allocation.
- delete operator is used in C++ for memory deallocation.

Q2) what are the write down a program which is used to allocate memory for 10 integers using malloc()

→ ~~#include <iostream>~~  
~~using namespace std;~~

~~#include <stdio.h>~~

~~#include <stdlib.h>~~

int main ()

{

int \* arr;

```

arr = (int *) malloc (10 * sizeof (int));
for (int i = 0; i < 10; i++)
{
    arr[i] = i + 1;
}
for (int i = 0; i < 10; i++)
{
    printf ("arr [%d] = %d\n", i, arr[i]);
}
free (arr);
return 0;
}

```

- e3) Write a program which is used to allocate memory for 10 integers using realloc

```

→
#include <stdio.h>
#include <stdlib.h>
int main ()
{
    int * arr;
    arr = (int *) malloc (10 * sizeof (int));
    realloc (arr, 10 * sizeof (int));
    if (arr == NULL)
    {
        printf ("memory allocation failed\n");
        return 1;
    }
}

```

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```
printf(" Enter 10 integers\n");
for (int i=0; i<10 ; i++)
{
    printf("%d ", arr[i]);
}
printf ("\n");
free (arr);
return 0;
}
```

Q) what is meant by dangling pointer

A dangling pointer is a <sup>special</sup> variable that points to an invalid memory location which stores memory address that points to garbage after being deleted.

Q) what is the return value of malloc() if memory manager is unable to allocate the memory?

If the memory manager is unable to allocate memory using the malloc() function it will return a NULL pointer.

Q) Write a syntax which is used to allocate the memory for N floats dynamically using malloc(). Accept the value of N from user at run time

#include <stdio.h>  
#include <stdlib.h>

```
int main ()
```

```
{  
    int N;  
    printf("Enter the number of floats:");  
    scanf("%d", &N);
```

float \*arr = (float \*) malloc (N \* sizeof (float))

return arr;

- Q7] Allocate dynamic memory for array of 5 element where each element is of below structure type

struct hello {

    float f;

    int i;

};

#include <stdio.h>

#include <stdlib.h>

struct hello {

    float f;

    int i;

};

int main ()

{

    struct hello \*arr = (struct hello \*)

        malloc (5 \* sizeof (struct hello));

    return arr;

};

(8) Explain internal working of new operator in detail.

→ New In the new operator dynamic memory allocation programming is used in C++.

the new operator internally work as calloc() and malloc() function in C.

when we create object using new operator the memory for allocating in heap memory.

The new operator is an operator which denotes a request for memory allocation on the heap if sufficient memory is available new operator initializes the memory & returns the address of the newly allocated & initialized memory to the pointer variable.

(9) Which is the need of typecasting for the return value of malloc?

→ When using malloc() the return type is a void\* which is a generic pointer to use the allocated memory, the pointer needs to be cast to the correct type, so that the operations performed on the pointer make.

(e) Explain the working of below application, draw its diagrammatic representation and predict the output

```

→ #include <stdio.h>
# include <stdlib.h>
int main ()
{
    int size = 0;
    int * p = NULL;
    int iCnt = 0;
    printf("Enter number of elements\n");
    scanf("%d", &size);

    p = (int*) malloc(size * sizeof(int));
    printf("Please enter the element\n");

    for (iCnt = 0; iCnt < size; iCnt++)
    {
        scanf("%d", &p[iCnt]);
    }

    printf("entered elements are\n");
    for (iCnt = 0; iCnt < size; iCnt++)
    {
        scanf("%d", &p[iCnt]);
    }

    printf("entered elements are\n");
    for (iCnt = 0; iCnt < size; iCnt++)
    {
        scanf("%d", p[iCnt]);
    }

    free(p);
    return 0;
}

```

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output:-

Enter number of elements

In the above Application variable size having datatype integers we create p pointer which is assigned as NULL.

We create integer variable icnt having value 0.

We Allocate the memory for P pointer using malloc function.

By using scanf function we can take the input from users & using the for loop we