4. What are the different errors that can occur in DMA?

- Dangling Pointer

- NULL Pointer

- Garbage

- Double free error

6. C program to create memory for int, char and float variable at run time.

```c
#include <stdio.h>

#include <stdlib.h>

int main()

{

  int *ptr_1;    // Declare an integer pointer

 char *ptr_2; //    // Declare an char pointer

 float *ptr_3; // Declare an float pointer


 // Now allocating memory to each pointer using dynamic memory allocation

 ptr_1 = (int*)malloc(1*sizeof(int));

 ptr_2 = (char*)malloc(1*sizeof(char)*1);

 ptr_3 = (float*)malloc(1*sizeof(float));


 printf("\nEnter the value for integer pointer : ");

 scanf("%d",ptr_1);

  printf("\nEnter the value for char pointer : ");

 scanf(" %c",ptr_2);
```

```c
printf("\nEnter the value for float pointer : ");

scanf("%f",ptr_3);

  printf("\nThe value stored in integer pointer is : %d",*ptr_1);

printf("\nThe value stored in char pointer is : %c",*ptr_2);

printf("\nThe value stored in float pointer is : %f",*ptr_3);

free(ptr_1);

free(ptr_2);

free(ptr_3);

ptr_1 = NULL;

ptr_2 = NULL;

ptr_3 = NULL;

  return 0;

}
```

6. Explain the difference between array and structures

Arrays are collection of same data type elements whereas in structures elements of different data types can also be stored together.
Example:

```
int arr[5]; //an array to stores 5 integers
struct st
{
        int arr[5];
        float b;
        char c;
        double c;
};      //a structure storing an integer array, float, character and double elements together.
```

11. Write a program that takes as input two-time instants (let say: t1(h1,m1,s1) and t2(h2,m2,s2) where h, m and s are hours, minutes and seconds resp.) and finds the difference between them (t1-t2) using the concept of structures.

INPUT:
Enter hrs, mins, secs for t1:
03
20
50
 Enter hrs, mins, secs for t2:
02
10
30

OUTPUT:
 Difference= 1:10:20

```
#include <stdio.h>
typedef struct time
{
 int sec;
 int min;
 int hrs;
}time;

void difference(time, time, time *);

int main()
{
   time t1,  t2, diff;
```

```
   printf("Enter hrs, mins, secs for t1:\n ");

   scanf("%d %d %d", &t1.hrs, &t1.min, &t1.sec);

   printf("Enter hrs, mins, secs for t2:\n ");
   scanf("%d %d %d", &t2.hrs, &t2.min, &t2.sec);

   difference(t1,t2, &diff);
   printf("Difference= %d:%d:%d\n", diff.hrs, diff.min, diff.sec);
  printf("\n ----END OF PROGRAM-----\n");
   return 0;
}

void difference (time start, time stop, time *diff)
{
   if(stop.sec > start.sec)
   {
      start.min--;
      start.sec = start.sec + 60;
   }

   diff->sec = start.sec - stop.sec;
   if(stop.min > start.min)
   {
      start.hrs--;
      start.min = start.min + 60;
   }

   diff->min = start.min - stop.min;
   diff->hrs = start.hrs - stop.hrs;


}
```

3) Why does strcmp return a number that's less than, equal to ,greater than zero ?Also does the exact return value have any significance?

Answer: The return value is the difference between the first mismatched characters in s and t strings, which will be negative if s points to a smaller string than t and positive if s points to a larger string

4. What will be the value of the string str after the following statements have been executed.

```c
#include<stdio.h>
int main()
{
char str[30];
strcpy(str,"tire-bouchon");
strcpy(&str[4],"d-or-wi");
strcat(str,"red?");
printf("%s",str);
}
```

Answer: tired-or-wired?

8. What is the output of C program with strings?

```c
int main()
{
char str1[]="JOHN";
char str2[20];
str2= str1;
printf("%s",str2);
return 0;
}
```

Answer: Compiler error

9. What will be the value of the string s1 after the following statements have been executed.

```c
#include<stdio.h>
int main()
{
char s1[30],s2[30];
strcpy(s1,"computer");
strcpy(s2,"science");
if(strcmp(s1,s2)<0)
strcat(s1,s2);
else
strcat(s2,s1);
s1[strlen(s1)-6]='\0';
printf("%s",s1);
}
```

Answer: computers

10. What does the following program print?

```c
#include<stdio.h>
int main()
{
char s[]="Hsjodi",*p;
for(p=s;*p;p++)
--*p;
puts(s);
}
```

Answer: grinch