Section A: Attempt all the Questions MCQ 1*10=10

1. Which is a valid C expression?

a) int my_num = 100,000;
b) int my num = 100000;
c) int my num = 1000;
d) int $my_num = 10000;

2. What are the elements present in the array of the following C code?
int array[5] = {5};
a) 5, 5, 5, 5, 5
b) 5, 0, 0, 0, 0
c) 5, (garbage), (garbage), (garbage), (garbage)
d) (garbage), (garbage), (garbage), (garbage), 5

3. What is the output of this C code?

```
1.  #include <stdio.h>
2.  main()
3.  {
4.      char *p = "This is pointer";
5.      p[0] = 'a';
6.      p[1] = 'b';
7.      printf("%s", p);
8.  }
```

a) Warning
b) This is pointer
c) Compile time error
d) Run time error

4. What will be the output of the following code snippet?

```c
#include <stdio.h>
int main() {
        int a = 3, b = 5;
        int t = a;
        a = b;
        b = t;
        printf("%d %d", a, b);
        return 0;
}
```

a) 3 5
b) 3 3
c) 5 5
d) 5 3

5. How is an array initialized in C language?

a) int a[3] = {1, 2, 3};
b) int a = {1, 2, 3};
c) int a[] = new int[3];
d) int a(3) = [1, 2, 3];

6. What does the following declaration indicate?
Int x: 8;

a) x stores a value of 8.
b) x is an 8-bit integer.
c) Both A and B.
d) None of the above.

7. How is the 3rd element in an array accessed based on pointer notation?

a) *a+3

b)*(a+3)

c) *(*a+3)

d)&(a+3)

8. What is the disadvantage of arrays in c?

a) The amount of memory to be allocated should be known beforehand.

b) Elements of an array can be assessed in constant time.

c) Elements are stored in contiguous memory blocks.

d) Multiple other data structures can be implemented using arrays.

9. What is the return type of the fopen() function in C?

a) Pointer to a FILE object

b) Pointer to an integer

c) An integer

d) None of the above

10. Which of the following will occur if we call the free() function on a NULL pointer?

a) compilation error

b) Runtime error

c) Undefined behavior

d) The program will execute normally

Section B: Short Questions (attempt any 5) 5*6=30

1. What are variables? Difference between local variables and global variables with examples.
2. Write a program to print out all triangular numbers from 1 up to nth term.
3. What are functions? Advantages of writing a program using functions.
4. What are parameters? Difference between actual parameters and informal parameters.
5. What are pointers? Difference between call by value and call by reference.
6. What is dynamic memory allocation? Difference between static memory allocation and dynamic memory allocation.
7. What is the use of free () in DMA? Difference between calloc and malloc explain mention its syntax.
8. Explain all the file handling functions including their syntax.
9. Write a program in C to swap two numbers using function.
10. Write a void function which finds and prints the midpoint coordinates of a line. The function should take in four parameters (x1, y1, x2 and y2).

    xmid=(x1+x2)/2, ymid=(y1+y2)/2

11. Create a structure named employee having members: empName, age and salary. Use this structure to read the name, age and salary of 2 employees and write entered information to a file employee.txt.
12. Write a program to read and write information in file employee.txt.
13. What are user defined functions explain with suitable example.

14. Differences between do while, while and for loop. Write any program using switch case including comments.
15. Write a program in C to compute the sum of all elements in an array using pointer.

Section C: Long Questions (attempt 1) 1*10= 10

1. Write a function named “velocityCalc” which returns an appropriate value for the formula “v=u+at”, where v is the final velocity, u is the initial velocity, a is the acceleration and t is the time that has elapsed. Depending upon which variable is set to “NAN” when the function is called, your function should work it out and return the value.
2. Write a program that allocates memory space as required by the user for three arrays. User enters the numbers for two arrays and the program sums the corresponding array elements and stores them in the third array.
3. Write a C program to search an element in array using pointers.
4. WAP to sort array elements in ascending order.
5. Compute sum of input entered by the user using DMA.
6. Create a structure name Student and inside that struct include two data members' roll no and marks, inside that struct student definition create another struct named student_info where you should include three data members' name, age, and date of birth and print it out for 3 students.