Code : 100104

B.Tech 1st Semester Exam., 2018 (New)

PROGRAMMING FOR PROBLEM SOLVING

Time : 3 hours *Full Marks* : 70

Instructions :

(i) All questions carry equal marks.

*(ii) There are **NINE** questions in this paper.*

*(iii) Attempt **FIVE** questions in all.*

(iv) Question No. 1 is compulsory.

1. Choose the correct answer (any *seven*) :

(a) Which of these, best describes an array?

(i) A data structure that shows a hierarchical behaviour

(ii) Container of objects of similar types

(iii) Container of objects of mixed types

(iv) All of the above

(b) How do you initialize an array in C?

(i) int arr[3] = (1,2,3);

(ii) int arr(3) = {1,2,3};

(iii) int arr[3] = {1,2,3};

(iv) int arr(3) = (1,2,3);

(c) When does the segmentation fault occur?

(i) Compile-time

(ii) Run-time

(iii) Both of the above

(iv) None of the above

(d) What is the output of the following program?

```
void main(){
    int a;
    a=1;
    while(a<=1)
    if(a%2)
    printf("%d", a++);
    else
```

```
    printf("%d", ++a);
    printf("%d", a+10);
}
```

(i) 011

(ii) 012

(iii) 111

(iv) 112

(e) What is the output of the following code?

```
void main()
{
    int i;
    i=0;
    if(i=15,10,5)
        printf("Programming %d",i);
    else
        printf("Skills %d",i);
    getch ();
}
```

(i) Skills 15

(ii) Programming 5

(iii) Programming 15

(iv) Skills 5

(f) What will be printed as the result of the operation below?

```
main()
{
    char s1[]="Cisco"
    char s2[]="systems";
    printf ("%s", s1);
}
```

(i) System

(ii) error

(iii) Cisco

(iv) Compilation fail

(g) Process of inserting an element in stack is called

(i) create

(ii) push

(iii) evaluation

(iv) Pop

(h) Consider the following segment of C-code :

```
int j, n;
j=1;
while (j<=n)
   j=j*2;
```

The number of comparisons made in the execution of the loop for any n>0 is:
(Base of log is 2 in all options)

(i) CEIL(log n)

(ii) CEIL(log n)+2

(iii) FLOOR(log n)+2

(iv) n

(i) The minimum number of comparisons required to find the minimum and the maximum of 100 numbers is

(i) 100

(ii) 200

(iii) 150

(iv) 148

(j) What is the output of following program?

```
#include <stdio.h>
in main()
{
  int a=1;
  int b=1;
  int c=a || --b;
  int d=a--&& --b;
```



```
  printf("a=%d, b=%d, c=%d, d=%d",
                          a, b, c, d);
  return 0;
}
```

(i) a = 0, b = 1, c = 1, d = 0

(ii) a = 0, b = 0, c = 1, d = 0

(iii) a = 1, b = 1, c = 1, d = 1

(iv) a = 0, b = 0, c = 0, d = 0

2. How array and pointers are related? Explain with the help of suitable diagrams.

3. *(a)* Write a C program to count the number lines input by the user.

(b) Explain the difference between call by reference and call by value with the help of a suitable example.

4. With the help of an example, differentiate between *static* and *dynamic* memory allocations.

5. What are library functions and their uses in C language? Can we write our own functions and include them in C library?

6. Write a "recursive" C program to print—

   (a) Fibonacci series;

   (b) factorial of a given number.

7. Write the differences between structure and union. Compare them with the help of an example.

8. Write a C program to convert an infix expression into postfix expression. In particular, an infix expression : $(1-2) * (4 \div 5)$ will have postfix expression : $12-45 \div *$.

9. Write a C program to illustrate reading of data from a file.

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