

**B.Tech 1st Semester Exam., 2019  
(New Course)**

**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 from any seven of the following :

(a) Let  $x$  be an integer which can take a value of 0 or 1. The statement `if (x == 0)x = 1; else x = 0;` is equivalent to which one of the following?

- (i)  $x = 1 - x$
- (ii)  $x = x + 1$
- (iii)  $x = x * 1$
- (iv)  $x = 1 \% x$

(b) A program attempts to generate as many permutations as possible of the string, 'abcd' by pushing the characters a, b, c, d in the same order onto a stack, but it may pop off the top character at any time. Which one of the following strings cannot be generated using this program?

- (i) abcd
- (ii) dcba
- (iii) cabd
- (iv) cbad

(c) Suppose a C program has floating constant 1.414, what is the best way to convert this "float" data type?

- (i) (float)1.414
- (ii) Float (1.414)
- (iii) 1.414f or 1.414F
- (iv) 1.414 itself of "float" data type, i.e., nothing else required

(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 this C code?

```
#include<stdio.h>
void main()
{
    int a = 5*3+2-4;
    printf("%d", a);
}
```

- (i) 13
- (ii) 14
- (iii) 12
- (iv) 16

(f) What is the output of this C code?

```
#include<stdio.h>
void main()
{
    int b = 6;
    int c = 7;
    int a = ++b+c--;
    printf("%d", a);
}
```

- (i) Run-time error
- (ii) 15
- (iii) 13
- (iv) 14

(g) What is the output of this C code?

```
#include<stdio.h>
void foo(int *);
int main()
{
    int i = 10;
    foo(&i);
}
void foo(int *p)
{
    printf("%d\n", *p);
}
```

- (i) 10
- (ii) some garbage value
- (iii) compile-time error
- (iv) segmentation fault/code crash

(h) User-defined data type can be derived by

- (i) struct
- (ii) enum
- (iii) typedef
- (iv) All of the above

(i) As per C language standard, which of the following is/are not keyword(s)? Pick the best statement :

- auto, make, main, sizeof, elseif
- (i) make, main

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- (ii) sizeof
- (iii) auto, make
- (iv) make, main, elseif

(i) What is the output of this C code (when 1 is entered)?

```
#include<stdio.h>
void main()
{
    double ch;
    printf ("enter a value
            between 1 to 2:");
    scanf("%lf", &ch);
    switch (ch)
    {
        case 1:
            printf("1");
            break;
        case 2:
            printf("2");
            break;
    }
}
```

- (i) Compile-time error
- (ii) 1
- (iii) 2
- (iv) None of the above

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2. What do you mean by pre-processor? Also explain the use of %i format specifier w.r.t, scanf() function.
3. Write a C program to perform binary search on a set of given sorted numbers.
4. Write a C program to find the number of lines in a text file.
5. Explain pointer arithmetic with the help of suitable diagrams.
6. Explain the following bitwise operators :
  - (a) Bitwise AND
  - (b) Bitwise OR
  - (c) Bitwise XOR
  - (d) Bitwise Left Shift
7. What do you mean by 'call by reference'? Explain with the help of a function which swaps two numbers.
8. Write a C program of the following :
  - (a) Reverse a string without using strrev().
  - (b) Concatenate two strings without using strcat()

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9. Write a 'recursive' C program to print the following :

✓(a) GCD of two numbers

(b) Merge-sort of a set of given numbers

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