



Name :

Roll No. :

Invigilator's Signature :

**CS/B.TECH(CSE)/SEM-3/CS-301/2010-11
2010-11**

PRINCIPLES OF PROGRAMMING LANGUAGES

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following :

$$10 \times 1 = 10$$

i) Which operator cannot be overloaded ?

- | | |
|-------|----------------|
| a) + | b) size of () |
| c) ++ | d) >>. |

ii) Which one of the following will read a character from the keyboard and will store it in the variable c ?

- | | |
|---------------------|--------------------------|
| a) c = getc (); | b) getc (&c); |
| c) c = getchar (); | d) c = getchar (stdin) |

- 2



vii) Polymorphism means

- a) one interface, multiple access
- b) multiple access with multiple interfaces
- c) multiple interfaces, single access
- d) none of these.

viii) Friend Function is a function by which

- a) a nonmember function can access all the private and protected members of a class for which it is a friend
- b) a member function can access all the private and protected members of a class
- c) a nonmember function can only access all the private member of a class
- d) none of these.

ix) The output of the following program

```
void main ( )
{
    int i = -3, j = 2, k = 0, m;
    m = ++ i && ++ j && ++ k;
    printf ( "%d%d%d%d", i, j, k, m );
}
```

is

- a) - 3 2 1 1
- b) - 3 2 1 0
- c) - 3 2 0 1
- d) - 2 3 1 1.



x) What will be the output of the following program ?

```
{  
    static int a [ 20 ];  
    int i = 0;  
    a [ i ] = i ++;  
    printf ( "\n%d%d%d", a [ 0 ], a [ 1 ], i );  
}
```

- | | |
|----------|----------|
| a) 0 0 1 | b) 0 1 1 |
| c) 1 0 0 | d) 1 0 1 |

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What are the properties of extern and static storage class ?
3. a) What is the difference between "overloading" and "overriding" in C++ ?

b) Give an example in C++ where " = " operator overloading can produce the same effect as that of a copy constructor. $2 + 3$
4. What is meant by a "Strongly Typed Language" ? Mention some ways by which the compiler can avoid type mismatch problems and mention their relative advantages and disadvantages. $2 + 3$



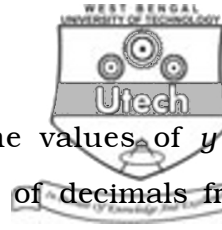
5. a) What will be the output of the following program ?
- ```
void main ()
{
 int m;
 for (m = 1; m < 7; m++)
 printf ("%d\n", (m%2) ? m : (m*2));
}
```
- b) Explain the working of "call by value" with a suitable example.  $2 + 3$
6. a) What is recursion ?
- b) Represent data hiding in a class with a suitable block diagram.  $2 + 3$

### GROUP – C

#### ( Long Answer Type Questions )

Answer any *three* of the following.  $3 \times 15 = 45$

7. a) How can a function be passed as an argument into another function ? Use a proper example.
- b) Write an algorithm to find the solution of  $f(x) = x^2 - 10$  using Bisection method with  $a = 1$ ,  $b = 3$  and  $\epsilon = 0.01$ .
- c) Write a program ( in C or C++ ) to find the largest number and the smallest number from a list of 100 numbers.  $3 + 6 + 6$



8. a) Find by Taylor's series method, the values of  $y$  at  $x = 0.1$  and  $x = 0.2$  to five places of decimals from  $dy/dx = x^2 y - 1$ ,  $y(0) = 1$ .

- b) Using Newton's backward interpolation formula find out  $f(18)$ .

|        |     |     |     |     |      |
|--------|-----|-----|-----|-----|------|
| $x$    | 0   | 5   | 10  | 15  | 20   |
| $f(x)$ | 1.0 | 1.6 | 3.8 | 8.2 | 15.4 |

- c) Solve the system of linear equation by Gauss Elimination method :

$$2x + 3y + z = 9$$

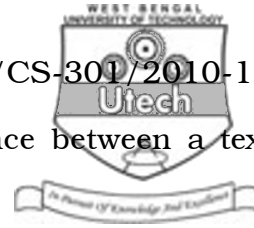
$$x + 3y + 3z = 6$$

$$3x + y + 2z = 8$$

correct up to 3 significant figures.

9. a) What are the differences between structure and union ?
- b) Write an algorithm which will take the statement :  
"I play football" as input and produces :
- number of words in the statement
  - number of characters in the statement.
- c) What is inheritance ? Give an example. What is the necessity of virtual base class in inheritance ?

$$3 + 7 + (3 + 2)$$



10. a) What is a file ? What is the difference between a text file and a binary file ?
- b) What are the advantages of dynamic memory allocation over static memory allocation ?
- c) Write a program to calculate the G.C.D. and L.C.M. of two given numbers.  $(2 + 2) + (3) + 8$
11. Write short notes on any *three* of the following :  $3 \times 5$
- a) Polymorphism
  - b) Macro and function
  - c) Sequential files
  - d) Constructor and deconstruction
  - e) Lagrange Interpolation.

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