



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech (CSE-OLD)/SEM-3/CS-301/2011-12

2011

PRINCIPLES OF PROGRAMMING LANGUAGE

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) In Newton's forward interpolation the intervals should be

- a) equally spaced
- b) not equally spaced
- c) may be equally spaced
- d) both (a) & (b).

ii) What will be output of the following code segment :

```
void main()  
{  
    int i=7;  
    printf{"%d",i++*i++);  
}
```

- | | |
|-------|--------|
| a) 49 | b) 50 |
| c) 56 | d) 64. |

- ```
#include<stdio.h>

void main()

{

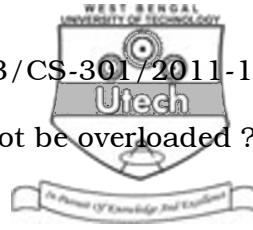
 int I=3,*j,**k;

 j=&I;

 k=&j;

 printf ("%d%d%d",*j,**k,*(*k));

}
```



vii) Which of the following operators cannot be overloaded ?

- a) `>=`
- b) `!=`
- c) `+`
- d) `sizeof`.

viii) `int(*m)[5]` is a declaration of

- a) pointer to an array
- b) array of pointers
- c) pointer to a function
- d) function returning a pointer.

ix) What is the output of the following code ?

```
int main()
{
 int y=10,z=10;
 cout<<(y==z);
}
```

- a) 0
- b) 1
- c) 2
- d) none of these.

x) “>>” is called

- a) insertion operator
- b) object
- c) extraction operator
- d) header file.



**GROUP – B**

**( Short Answer Type Questions )**

Answer any *three* of the following.

3 × 5 = 15

2. a) Define class and object. 2  
b) Write a program in C++ to evaluate the largest and smallest out of three real numbers using 'call by reference'. 3
3. a) What is the difference between macro and function ? 2  
b) What are the merits and demerits of friend function ? 3
4. a) What is inheritance ? What is the use of virtual base class in inheritance ? 3  
b) What is virtual function ? Explain with an example. 2
5. a) What is constructor ? What are the different features of a constructor ? 2  
b) Write a program which calculates the function  $F = Ax^2 + Bx + C$  where  $A = 2$ ,  $B = 3$ ,  $C = 4$ ,  $x = 5$  by using the concept of constructor. 3
6. a) How does malloc and new differ from each other ? 2  
b) What is polymorphism ? What are the various types of polymorphism available in C++ ? 3

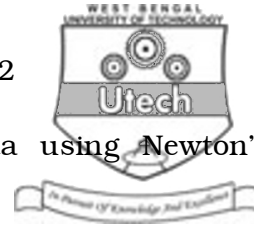


**GROUP – C**

**( Long Answer Type Questions )**

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

7. a) What are the differences between structure and union ?
- b) How does append mode differ from write mode ?
- c) Write a user-defined function to concatenate two strings.
- d) What is significance of EOF ? What is the difference between `getc( )` and `getchar( )` ?
- e) What is the advantage of using `typedef` keyword ? What is the purpose of `ftell(fp)` and `rewind(fp)` function, where `fp` is a FILE pointer ?  $2 + 2 + 5 + 3 + 3$
8. a) What is inline function ? Write with an example. How does it differ from ordinary function ?
- b) What is operator overloading ? Write a program to overload '+' operator to add two complex numbers.
- c) What is friend function ? What are the merits and demerits of using friend function ?
- d) What is pure virtual function ?  $4 + 6 + 4 + 1$



9. a) Find  $e^{-1.30}$  from the following data using Newton's forward interpolation formula :

| $x$          | 1.00   | 1.25   | 1.50   | 1.75   | 2.00   |
|--------------|--------|--------|--------|--------|--------|
| $Y = e^{-x}$ | 0.3679 | 0.2865 | 0.2231 | 0.1738 | 0.1353 |

- b) Write a computer oriented algorithm to find out the root of the equation  $f(x) = 0$  using Regula-Falsi method.
- c) Define 'absolute error' and 'relative error'. Explain with suitable example.
10. a) Find  $y(0.2)$  by using modified Euler's method, given that  $dy/dx = \log(x + y)$ ,  $y(0) = 1.0$ .

- b) Write an algorithm to evaluate  $\int_a^b f(x) dx$  using Trapezoidal rule.
- c) Solve the following system of equations using Gauss Elimination method :

$$x_1 + x_2 + x_3 = 6$$

$$3x_1 + 3x_2 + 4x_3 = 20$$

$$2x_1 + x_2 + 3x_3 = 13$$

$$5 + 5 + 5$$



11. a) Write a C program to create two different files named as ODD.dat and EVEN.dat to store odd and even numbers. The numbers should be read out from NUMBER.dat file which contains ten integer numbers in it.
- b) Write a C program to replace a particular word by another word in a given string. For example, the word "PASCAL" may be replaced by "C++" in the string "PASCAL is a good programming language".
- c) Write a C++ program which contains a base class and a derived class. The base class data members are name, roll, address and the derived class data members are height and weight. The object for the derived class must be declared as array of objects. The member functions are used to get information on the derived class from the keyboard and display the contents of the array of class objects on the screen.

5 + 5 + 5

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