

This question paper contains 4+1 printed pages]

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S. No. of Question Paper : 13

Unique Paper Code : 234161

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Name of the Paper : Computer Science–I (Fundamentals of Programming)

Name of the Course : B.Sc. Math Sc./B.Sc. Life Science

Semester : I

Duration : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Question No. 1 is compulsory.

Attempt any *five* questions from Q. No. 2 to Q. No. 8.

All parts of a question must be attempted together.

1. (a) Distinguish between dynamic binding and message passing. 2

(b) What is the output of the following program : 2

```
main( )
```

```
{
```

```
int n=3;
```

```
while(n>=0)
```

P.T.O.

```

    }

    cout<<n*n<<endl;

    --n;

}

cout<<n<<endl;

while(n<2)

cout<<++n<<endl;

}

```

- (c) In C++ variable can be declared anywhere in the scope. What is the significance of this feature ? 2
- (d) Identify the error in the following code : 2

```

#include<iostream.h>

void main( )

{

short a=2500, b=3000

cout>>"a+b=">>-(a+b);

}

```

- (e) What are the applications of void data type in C++ ? 2
- (f) What is the advantage of function prototype in C++ ? 2
- (g) When will we make a function inline and why ? 2
- (h) What do you mean by friend function ? 2
- (i) What is static member function ? Explain with example. 3
- (j) Find errors if any in the following function prototypes : 3
- (i) float average(x,y);
- (ii) intnul(int a=10,int b);
- (iii) void add(int enum);
- (k) Give the declaration for opening and closing of file with example. 3
2. (a) Define a class for storing complex numbers. Provide 0, 1, 2 argument constructors which respectively construct the complex number with real and imaginary part 0, a complex number imaginary part 0 and real part as specified by the argument and a complex number with real and imaginary parts as specified by the arguments. 6
- (b) What do you mean by operator overloading ? Write a program to overload binary operator using friend function. 4
3. (a) What do you mean by inheritance ? What are the different kinds of inheritance ? 5
- (b) What is virtual base class ? When do we make a class virtual ? Explain with example. 5

4. (a) What do you mean by this pointer ? What does this pointer points to ? Give applications of this pointer. 5
- (b) Write a program in C++ which has a function add that is able to concatenate two strings, if values passed are strings and can perform addition, if values are numbers. 5
5. (a) What do you mean by Exception handling ? Explain the mechanism to handle exceptions ? Can we rethrow an exception ? 6
- (b) Write a program having a function named "swap_floats" that take two floating point arguments and interchange the values that are stored in arguments. The function should return no value. To take an example, if the following code fragment is executed :
- ```
float a=3.2, b=5.8;
```
- ```
swap_floats(a,b);
```
- ```
cout<<a<<" "<<b<<endl;
```
- then output will be
- ```
5.8 3.2
```
- 4
6. (a) Write a program to calculate the sum of digit of a number. 3
- (b) Write a program to compare and swap the private data members of two objects from two different classes. Display the result accordingly. 7

7. (a) Define a class "ACCOUNT". Include the following members :

Data Members : Name of Depositor, Account No., Type of Account, Balance Amount.

Member Function : to assign initial values, deposit amount, withdraw after checking balance, to display name and balance. Write main program for 10 customers. 5

- (b) Distinguish between virtual function and pure virtual function with example. 5

8. (a) Write a recursive function that returns factorial of a number. 4

- (b) Write a program to create an input file and display its content. 4

- (c) Distinguish between data encapsulation and data abstraction. 2