

```

class A{
    int k;
    public:
    A()
    {
        k=1;
    }
    void set(int n)
    {
        k = n;
    }
    void disp()
    {
        cout << "k = " << k << "\n";
    }
};

A f()
{
    A ob;
    ob.set(50);
    return ob;
}

int main()
{
    A obj1;
    obj1.disp();
    obj1 = f();
    obj1.disp();
    return 0;
}

```

(3)

(1800)

11/12/18 (Evening)

[This question paper contains 10 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 844 **I**
 Unique Paper Code : 32345102
 Name of the Paper : Introduction to Programming
 Name of the Course : **Computer Science : Generic Elective for Honours**
 Semester : I
 Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
 2. Question 1 is compulsory.
 3. Attempt any **five** questions out of **Q.2 to Q.8**.
 4. Parts of a question must be answered together.
-
1. (a) Write a statement that uses the ternary conditional operator to set an integer variable ticket to 1 if speed is greater than 55 and 0 otherwise. (2)
 - (b) Write a single C++ statement that outputs the string Generic Elective I and the number 75 as shown below: Generic Elective I 75 (2)
 - (c) An integer variable temp has the initial value 10. Write a C++ statement that uses a prefix decrement operator to decrease the value of temp to 9. (1)

P.T.O.

(d) Declare a structure named `employee` for storing employee details (name, salary, age, gender). (3)

(e) Rewrite the following C++ code snippet using a for loop:

```
x=1;n=10;
while(x<n)
{
    cout<<x<<"\t";
    ++x;
} (2)
```

(f) Write C++ statements to:

- 1) Define a constant N to be 100.
- 2) Declares a one dimensional array called `dArray` of type `double` that holds N elements.
- 3) Display the tenth element of the array `dArray`. (2)

(g) What will be the output of following C++ code segment:

```
int age =9;
cout<<age++; (1)
```

(h) Give the output of the following C++ code snippets:

```
i) while(0)
    cout<<"I am inside while "<< endl;
    cout<<"I am outside while "<<endl; (1)
```

(b) What is the output of the following code snippet?

```
char ch = 'x' ;
switch( ch )
{
    case 'a' :
    case 'e' :
    case 'i' :
    case 'o' :
    case 'u' :
        cout <<" Vowel "<< endl;
    default : cout <<" Consonant "<< endl;
} (2)
```

(c) What is the output of the following code snippet?

```
void MyFunction(int a, int b = 40)
{
    cout<<" a = "<< a <<" b = "<< b << endl;
}
int main()
{
    MyFunction(20, 30);
    return 0;
} (2)
```

(d) What is the output of the following code snippet?

(d) Create an object of Triangle class in main function and show usage of the above member functions. (3)

7. (a) Create a class Building having the following integer data members:

no_Rooms, no_Floors and Area.

Derive the following two classes from Building:

1) House with two integer variables:
no_bedrooms, no_washrooms

2) College with two integer variables:
no_classrooms, no_offices (6)

(b) Write a function factors() in C++ that accepts an integer parameter num from the function main(). The function factors() returns the sum of all the factors of num. Recall that a number n is said to be a factor of m if n divides m. For example, 3 is a factor of 6; but 3 is not a factor of 7.

8. (a) Declare a structure Time that includes three integer variables viz. hours, minutes and seconds. Declare a Time type structure variable CurrentTime. Write a C++ statement that sets hours member of the CurrentTime structure variable equal to 11, minutes member of the CurrentTime structure variable equal to 25 and seconds member of the CurrentTime structure variable equal to 12. (3)

```
ii) for (int i = 1; i <= 10; i++)
    if(i%2 == 0) cout << i << " ";
(2)
```

```
iii) int i = 10;
    for (; i<13 ; i++)
        cout<<"I am inside for loop "
        << endl;
(2)
```

(i) What is wrong with the following code snippet?

```
class First{
    int a;
public:
    First(int i)
    {
        a = i;
    }
    void set(int n)
    {
        a = n;
    }
    void disp()
    {
        cout << "a = " << a << "\n";
    }
};
int main()
{
```

```

First obj1;
obj1.set(2);
obj1.disp();
return 0;
}

```

(3)

(j) Declare a class Student that is publicly derived from a class Person. Assume suitable data and member functions and their types. Function definitions are not required.

(4)

2. (a) A ten-digit phone number, such as 2127678900, has three parts: a 3-digit area code (such as 212), a 3-digit exchange (such as 767), and a 4-digit number (such as 8900). Write a C++ program that uses a structure named phone to store these three parts of a phone number separately. Declare and initialize a structure variable of type phone. Also write C++ statements to display this phone number.

(6)

(b) Write a C++ program to display the first n even numbers, where n is a user entered parameter.

(4)

3. (a) Write a C++ program that asks the user to enter the number of rows (r) and number of columns (c) of a 2-dimensional integer matrix marks. Here, r and c respectively refer to student ID and subject. Each cell value depicts the marks obtained by a student in a particular subject. Accept the marks matrix of order r*c from the user. Find the total marks for each student.

(6)

```

cout << x << " is same as " <<
y << endl;

```

else

```

cout << x << " is not same as "
<< y << endl;

```

(2)

```

ii) int i = 15 ;

```

```

for (int j = 2 ; j <= i/2; j++)

```

```

if ( i%j == 0 )

```

```

cout <<j<< " is a factor of "
<<i<< endl;

```

(4)

6. (a) Create a class Triangle having three floating point data members (side1, side2 and side3) corresponding to the three sides of the triangle.

(2)

(b) Define a parameterized constructor for the Triangle class which takes three parameters to set the three sides of the triangle.

(2)

(c) Define member functions for the following :

(i) Display the sides of the triangle

(ii) The function should return zero if the triangle is not equilateral and one otherwise. An equilateral triangle has all the three sides equal.

(3)

(b) Write a C++ program to print squares of numbers entered by the user using a while loop. When the number entered is negative, the loop should be exited. (4)

(a) Write a function `count` in C++ that accepts a one dimensional array `list` of integers. Also accept an integer variable `num` from the user. The function `count` returns the number of occurrences of `num` in `list`. Call this function from `main()` and display the result in `main()`. (4)

(b) Write a C++ program that accepts two floating point numbers from the user and displays the following menu.

1. Multiply

2. Divide

According to the choice entered by the user, the program employs a switch statement to perform the desired operations and display the result. (6)

5. (a) Find the errors in the following code snippet and give reasons for the same:

```
class C1
{
    int i;
    public:
```

```
    C1()
    {
        i=0;
    }
protected:
    int k;
};
class C2 : public C1
{
    public:
        void add()
        {
            cout << k + i;
        }
};
int main()
{
    C1 obj1;

    C2 obj2;
    cout<<obj1.i;
    obj2.add();
} (4)
```

(b) What is the output for the following code snippet?

```
    i) int x = 5, y = 7;

       if (x = y)
```