

2009

SECTION A (40 MARKS)

Attempt all questions

Question 1

- (a) Why is a class called a *factory of objects*? [2]
 (b) State the difference between a *boolean literal* and a *character literal*. [2]
 (c) What is the *use and syntax* of a ternary operator? [2]
 (d) Write one word answer for the following:
 (i) A method that converts a string to a primitive integer data type.
 (ii) The *default initial value* of a boolean variable data type. [2]
 (e) State one similarity and one difference between *while* and *for* loop. [2]

Question 2

- (a) Write the function prototype for the function "sum" that takes an integer variable (x) as its argument and returns a value of float data type. [2]
 (b) What is the use of the keyword *this*? [2]
 (c) Why is a class known as composite data type? [2]
 (d) Name the keyword that:
 (i) is used for allocating memory to an array.
 (ii) causes the control to transfer back to the method call. [2]
 (e) Differentiate between pure and impure function. [2]

Question 3

- (a) Write an expression for [2]
 (b) The following is a segment of a program

```
x=1;y=1;
if (n>0)
{
x=x+1;
y=y-1;
}
```

What will be the value of x and y, if n assumes a value (i) 1 (ii) 0? [2]

- (c) Analyze the following program segment and determine how many times the body of the loop will be executed (show the working). [2]

```
x=5; y=50;
while(x<=y)
{
y=y/x;
System.out.println(y);
}
```


 (d) When there are multiple definitions with same function name, what makes them different? [2]
 (e) Given that `int x[]={2,4,6,3,5,7}`; What will be the value of `x[1]` and `x[5]`? [2]
 (f) Give the output of the following code fragment:
 when i) `opn = 'b'` ii) `opn = 'x'` iii) `opn = 'a'`

```
switch(opn)
{
    case 'a': System.out.println("Platform Independent"); break;
    case 'b': System.out.println("Object Oriented");
    case 'c': System.out.println("Robust and Secure"); break;
    default: System.out.println("Wrong Input");
}
```

- (g) Consider the following code and answer the questions that follow: [3]

```
class academic
{
    int x,y;
    void access()
    {
        int a,b;
        academic student =new academic();
        System.out.println("Object Oriented");
    }
}
```

- (i) What is the object name of the class `academic`?
 (ii) Name the class variables used in the program.
 (iii) Write the local variables used in the program.
 (iv) Give the type of the function used and its name. [4]
 (h) Convert the following segment into an equivalent do loop.

```
int x,c;
for(x=10,c=20;c>=10;c=c-2)
x++;
```

 [3]

2009

SECTION B (60 MARKS)

Attempt any four questions

Question 4

An electronics shop has announced the following discounts on the purchase of certain items.

Purchase amount in Rs.	Discount on Laptop	Discount on Desktop PC
0 – 25000	0.0%	5.0%
25001 – 57000	5.0%	7.5%
57001 – 100000	7.5%	10.0%
More than 100000	10.0%	15.0%

Write a program based on the above criteria, to input name, address, amount of purchase and type of purchase (L for Laptop and D for Desktop) by a customer. Compute and print the discount and net amount to be paid by a customer along with his name and address.

(Hint: $\text{discount} = (\text{discount rate}/100) * \text{amount of purchase}$)

$\text{Net amount} = \text{amount of purchase} - \text{discount}$ [15]

Question 5

Write a program to generate a **triangle** or an **invertedTriangle** till **n** terms based upon the user's choice of triangle to be displayed.

Example 1

Input: Type 1 for a triangle and
 type 2 for an inverted triangle
 1
 Enter the number of terms
 5

Output:

```

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
    
```

Example 2

Input: Type 1 for a triangle and
 type 2 for an inverted triangle
 2
 Enter the number of terms
 6

Output:

```

6 6 6 6 6 6
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1
    
```

Question 6

Write a program to input a sentence and print the number of characters found in the longest word of the given sentence. For example if S = "India is my country" then the output should be 7. [15]

Question 7

Design a class to overload a function **num_calc()** as follows:

- (a) void num_calc(int num, char ch) with one integer argument and one character argument, computes the square of integer argument if choice ch is 's' otherwise finds its cube.
- (b) void num_calc(int a, int b, char ch) with two integer arguments and one character argument. It computes the product of integer arguments if ch is 'p' else adds the integers.
- (c) void num_calc(String s1, String s2) with two string arguments, that prints strings are equal or not. [15]

Question 8

Write a menu driven program to accept a number from the user and check whether it is a 'BUZZ' number or to accept any two numbers and print the 'GCD' of them.

- (a) A BUZZ number is number which either ends with 7 or divisible by 7.
- (b) GCD (Greatest Common Divisor) of two integers is calculated by continued division method. Divide the larger number by the smaller; the remainder then divides the previous divisor. The process is repeated till the remainder is zero. The divisor then results GCD. [15]

Question 9

Annual examination results of 50 students in a class are tabulated as follows.

Roll no.	Subject A	Subject B	Subject C
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Write a program to read the data, calculate and display the following:

- a) Average mark obtained by each student.
- b) Print the roll number and average marks of the students whose average mark is above 80.
- c) Print the roll number and average marks of the students whose average mark is below 40. [15]