

2006

## SECTION A (40 MARKS)

Attempt all questions

**Question 1**

- (a) Define *encapsulation*.  
 (b) Explain the term *object using* an example.  
 (c) Define a *variable*.  
 (d) What is a *wrapper class*? Give an example.  
 (e) What is the purpose of the *new* operator? [10]

**Question 2**

- (a) State the two kinds of *data types*.  
 (b) Write corresponding expressions for following mathematical operations:-  
 (i)  $a^n + b^n$   
 (ii)  $z = x^m + y^m - xy / z$   
 (a) Define an *impure function*.  
 (b) Differentiate between *if* and *switch* statements.  
 (c) What will be the output for the following program segment?  

```
String s = new String("abc");
System.out.println(s.toUpperCase());
```

 [10]

**Question 3**

- (a) What is meant by *private visibility of a method*? [2]  
 (b) Find output and correct the errors in the following program segment:-  

```
int n[ ] = (2,4,6,8,10);
for (int i = 0; i <= 5; i++)
System.out.println("n[" + i + "]" = " + n[i]);
```

 [2]  
 (c) Explain *function overloading* with an example. [4]  
 (d) Find the output of the following program segment, when:  
 (i) val = 500  
 (ii) val = 1600  

```
int val, sum, n = 550;
sum = n + val > 1750? 400 : 200;
System.out.println(sum);
```

 [2]  
 (e) What is a *default constructor*? [2]  
 (f) What will be the output for the following program segment?  

```
int a = 0, b = 30, c = 40;
a = - -b + c++ +b;
System.out.println(" a =" + a);
System.out.println(" b =" + b);
System.out.println(" c =" + c);
```

 [2]  
 (g) Differentiate between *compareTo()* and *equals()* methods. [2]  
 (h) What is a *package*? Give an example. [2]  
 (i) Explain the function of a *return* statement. [2]

**2006**  
**SECTION B (60 MARKS)**  
*Attempt any four questions*

**Question 4**

Write a program to calculate and print *the sum of odd numbers* and *the sum of even numbers* for the first *n* natural numbers. The integer *n* is to be entered by the user. [15]

**Question 5**

A cloth showroom has announced the following festival discounts on the purchase of items, based on the total cost of the items purchased:-

<u>Total cost</u>	<u>Discount (in Percentage)</u>
Less than Rs.2000	5%
Rs. 2001 to Rs. 5000	25%
Rs.5001 toRs.10000	35%
Above Rs. 10000	50%

Write a program to input the name of the customer and cost, to compute and display the bill as follows.

Name	Total cost	Discount	Net amount
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 [15]
**Question 6**

Consider the following statement:-

"January 26 is celebrated as the Republic Day of India".

Write a program to change 26 to 15, *January* to *August*, *Republic* to *Independence* and finally print "August 15 is celebrated as the Independence Day of India". [15]

**Question 7**

Write a program that outputs the results of the following based on the number entered by the user.

- (i) Natural logarithm of the number.
- (ii) Absolute value of the number.
- (iii) Square root of the number.
- (iv) Random numbers between 0 and 1. [15]

**Question 8**

The marks obtained by 50 students in a subject are tabulated as follows:-

<u>Name</u>	<u>Marks</u>
*	*
*	*
*	*

Write a program to input names and marks of the students in the subject. Calculate and display:-

- (i) The subject average marks (subject average marks=subject total/50)
- (ii) Highest mark in the subject and name of the student.  
 (The maximum mark in a subject is 100) [15]

**Question 9**

Write a program to accept 15 integers from the keyboard, assuming that no integer entered is a zero. Perform *selection sort* on the integers and then print them in **ascending order**. [15]