

**COMPUTER APPLICATIONS - 2006**  
**(Theory)**  
**(Two Hours)**

*Answers to this Paper must be written on the paper provided separately.*

*You will **not** be allowed to write during the first 15 minutes.*

*This time is to be spent in reading the question paper.*

*The time given at the head of this Paper is the time allowed for writing the answers.*

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*This Paper is divided into two Sections.*

*Attempt **all** questions from **Section A** and **any four** questions from **Section B**.*

*The intended marks for questions or parts of questions are given in brackets [ ].*

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**SECTION A (40 Marks)**

*Attempt all questions.*

**Question 1**

[10]

- (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?

**Question 2**

[10]

- (a) State the two kinds of *data types*.
- (b) Write the corresponding expressions for the following mathematical operations:-

(i)  $a^2 + b^2$

(ii)  $z = x^3 + y^3 - \frac{xy}{z}$

- (c) Define an *impure function*.
- (d) Differentiate between *if* and *switch* statements.
- (e) What will be the output for the following program segment?  
String s = new String("abc");

```
System.out.println(s.toUpperCase());
```

### Question 3

(a) What is meant by *private visibility of a method*? [2]

(b) Find and correct the errors in the following program segment:- [2]

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

(c) Explain *function overloading* with an example. [4]

(d) Find the output of the following program segment, when:

(i) val = 500 [1]

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

(ii) val = 1600 [1]

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

(e) What is a *default constructor*? [2]

(f) What will be the output for the following program segment? [2]

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

(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]

**SECTION B (60 Marks)****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. [15]  
The integer  $n$  is to be entered by the user.

**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:- [15]

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

Write a program to input the total cost and to compute and display the amount to be paid by the customer after availing the discount.

**Question 6**

Consider the following statement:- [15]  
"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".

**Question 7**

Write a program that outputs the results of the following evaluations based on the number entered by the user. [15]

- (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.

### Question 8

[15]

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

Name	Marks
.	.
.	.
.	.

Write a program to input the names and the marks of the students in the subject.

Calculate and display:-

(The maximum marks in the subject are 100)

- (i) The subject average marks (  $\text{subject average marks} = \text{subject total} / 50$  )
- (ii) The highest mark in the subject and the name of the student.

### 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]