Computer Application:

General Instructions

1. This Paper is divided into two Sections.
2. Attempt all questions from Section A and any four questions from Section B.
3. The intended marks for questions or parts of questions are given in brackets [
   ].

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. $z = x^3 + y^3 - xy / z$

(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:-
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 > l750? 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); [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]

SECTION B (60 Marks)

Attempt any four questions from this Section.

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:- Total cost Discount (in Percentage)

Total cost	Discount (in Percentage)
Less than Rs. 2000	5%
Rs. 2001 to Rs. 5000	25%
Rs. 5001 to Rs. l0000	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. [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 evaluations 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:- Name Marks

Name	Marks
.	.
.	.
.	.

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

i. The subject average marks (subject average marks = subject total / 50)

ii. The highest mark in the subject and the name of the student.
iii. The maximum marks in the subject are 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]