V I B G Y O R H I G H

First Preliminary Examination

2020-2021

COMPUTER APPLICATIONS

Grade: X **Max. Marks : 100**

Date : 08/12/2020 **Time Allowed: 2 hour**

INSTRUCTIONS:

- **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.**
- **The intended marks for the questions or parts of questions are given alongside the questions.**
- **This question paper contains 4 printed pages.**

SECTION A(40 marks)
(Attempt **all** questions)

Q.1 **Answer the following questions.** **[10]**

a What are the default values of the primitive data type int and float? [2]

b Name any two OOP principles. [2]

c Identify the literals listed below: [2]
(i) 0.5 (ii) 'A' (iii) false (iv) "a"

d Why is an object called an instance of a class? [2]

e Convert following do-while loop into for loop. [2]

```
int i = 1;
int d = 5;
do{
    d = d * 2;
    System.out.println(d);
    i++;

}while(i <= 5);
```

Q.2 **Answer the following questions.** **[10]**

a Differentiate between constructor and function. [2]

b Write the output for the following: [2]

```
String s = "Today is Test";
System.out.println(s.indexOf('T'));
System.out.println(s.substring(0, 7) + " " + "Holiday");
```

c Determine the number of bytes required to store in an int array of A[23]. [2]

d What are the types of casting shown by the following examples? [2]
(i) char c = (char)120; (ii) int x = 't';

e Give the output of the following code: [2]

```
String A = "26", B = "100";
String D = A + B + "200";
int x = Integer.parseInt(A);
int y = Integer.parseInt(B);
int d = x + y;
System.out.println("Result 1 = " + D);
System.out.println("Result 2 = " + d);
```

Q.3 **Answer the following questions.** **[20]**

a Name the wrapper classes of char type and boolean type. [2]

b Analyze the given program segment and answer the following questions: [2]

```
for(int i = 3; i <= 4; i++){
   for(int j = 2; j <i; j++){
      System.out.print("");
   }
   System.out.println("WIN");
}
```

(i) How many times does the inner loop execute?
(ii) Write the output of the program segment.

c Write the function prototype of the following: [2]

A function posChar which takes a string argument and a character argument and returns an integer value.

d What is the difference between the Scanner class functions next() and nextLine()? [2]

e Differentiate between formal parameter and actual parameter. [2]

f What is the value of x1 if x = 5? [2]

```
x1 = ++x - x++ + --x;
```

g Rewrite the following program segment using the if..else statement: [2]

comm = (sale > 15000)? sale * 5 / 100 : 0;

h Define Function prototype with example. [2]

i Differentiate between indexOf() and lastIndexof(). [2]

j If array[ ]={1,9,8,5,2}; [2]
(i) What is array length?
(ii) What is array[2]?

SECTION B (60 Marks)

Attempt **any four** questions from this Section.
(Each program should be written with **Variable description table)**

Q.4 Define a class named BookFair with the following description: **[15]**
Instance variables/data members:
String bName: stores the name of the book.
double price: stores the price of the book.
Member methods:
BookFair(): default constructor to initialize data members.
void input(): to input and store the name and the price of the book.
void calculate(): to calculate the price after discount. Discount is calculated based on the following criteria:

PRICE	DISCOUNT
Less than or equal to Rs. 1000	2% of price
More than Rs. 1000 and less than or equal to Rs. 3000	10% of price
More than Rs. 3000	15% of price

void display(): to display the name and price of the book after discount.

Q.5 Write a program to accept a number and check and display whether it is a spy number or not. A number is spy if the sum of its digits equals the product of its digits. **[15]**
Example: Consider the number 1124.
Sum of the digits = 1 + 1 + 2 + 4 = 8.
Product of the digits = 1 × 1 × 2 × 4 = 8.

Q.6 Using switch statement, write a menu-driven program for the following: **[15]**
(i) To find and display the sum of the series given below:
$S = x^1 – x^2 + x^3 – x^4 + x^5 … – x^{20}$, where x = 2.
(ii) To display the following series:
1 11 111 1111 11111
For an incorrect option, an appropriate error message should be displayed.

Q.7 Design a class to overload a function area() as follows: **[15]**

(i) double area(double a, double b, double c) with three double arguments, returns the area of a scalene triangle using the formula:
area = √(s(s – a)(s – b)(s – c))
where s = (a + b + c) / 2.

(ii) double area(int a, int b, int height) with three integer arguments, returns the area of a trapezium using the formula:
area = 1/2 × height × (a + b)

(iii) double area(double diagonal1, double diagonal2) with two double arguments, returns the area of a rhombus using the formula:
area = 1/2 × (diagonal1 × diagonal2)

Q.8 Write a program to initialize the year of graduation from school as an integer value from the user. Using the linear search technique on the sorted array of integers given below, output the message "Record exists" if the value input is located in the array. If not, output the message "Record does not exist". Use the values given : {1982, 1987, 1993, 1996, 1999, 2003, 2006, 2007, 2009, 2010} **[15]**

Q.9 Write a program to store 7 numbers in a Single Dimensional Array (SDA). Now, display only those numbers that are perfect squares. **[15]**

Sample Input :

n[0]	n[1]	n[2]	n[3]	n[4]	n[5]	n[6]	n[7]
12	45	49	78	64	77	45	81

Sample Output: 49, 64, 81

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