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CHRIST NAGAR HR SEC. SCHOOL, TRIVANDRUM

SECOND TERMINAL EXAMINATION 2022-'23

X (ICSE)

Time : 2 hrs

Marks : 100

COMPUTER APPLICATIONS

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. 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 [].

SECTION A (Attempt all questions.)

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 [].

Question 1

Choose the correct answers to the questions from the given options. (Do not copy the question, Write the correct answer only.) [20]

- (i) When a primitive data type is converted to its corresponding object of its class, it is called as _____.
a) Boxing (b) Explicit type conversion
(c) Unboxing (d) Implicit type conversion
- (ii) Identify the correct array declaration statement:
(a) `int a[10];` (b) `int a[]=new int[10];`
(c) `int arr[i]=10;` (d) `int a[10]=new int[];`
- (iii) The method that changes the state of an object
(a) Impure method (b) pure method
(c) `next()` (d) `println()`
- (iv) Wrapper classes are available in _____ package.
(a) `java.io` (b) `java.util`
(c) `java.lang` (d) `java.awt`

[P.T.O]

- v) Which principle of OOPs is implemented by function overloading?
- (a) Encapsulation (b) Polymorphism
(c) Data Abstraction (d) Dynamic Binding
- vi) The keyword which refers to the current object is called:
- (a) new (b) private
(c) this (d) void
- vii) If String n[] = {"RAJA", "RAM", "MOHAN", "ROY"}; then find the value of b where b = n[2]. charAt(2).
- (a) H (b) O
(c) A (d) M
- viii) A variable that is declared within the body of a method is called
- (a) Instance variable (b) Class variable
(c) Local variable (d) Global variable
- ix) Name the keyword that distinguishes instance variables and class variable
- (a) main (b) public
(c) void (d) static
- x) What is the wrapper class for double data type
- (a) Float (b) String
(c) Double (d) Boolean
- xi) A method with the same name as of the class and with arguments and no return data type is termed as:
- (a) Parameterised constructor (b) Default constructor
(c) constructor overloading (d) None of the above
- xii) An integer array with size 10 occupies
- (a) 10 bytes (b) 4 bytes
(c) 40 bytes (d) 80 bytes
- xiii) The method to check if a character is an alphabet or not
- (a) isLetter(char) (b) isAlpha(char)
(c) isUppercase(char) (d) isLowercase(char)

- 5
- 12
- v) `System.out.println ("Google".compareTo ("Google Chrome"));`
 (a) 0 (b) -1 (c) -7 (d) 7
- v) Name the search algorithm that compares the sought key value with the key value of the middle element of the array at each stage.
 a) linear search b) binary search
 c) selection sort algorithm d) bubble sort
- vi) What will be the output of the following code?
`String s = "racecar";`
`System.out.println(s.lastIndexOf("r"));`
 (a) 0 (b) 1 (c) 7 (d) 6
- vii) `"Hyperlink".compareToIgnoreCase("hyperlink")` will result in:
 (a) 0 (b) 1
 (c) 32 (d) -32
- viii) An array element is accessed by
 (a) using dot operator (b) using an element name
 (c) using index number (d) none of these
- ix) Which of the following function definitions **cannot** be overloaded with the method given below?
`public void sample(int a, int b)`
 (a) `public void sample(double a, double b)`
 (b) `public double sample (float a, float b)`
 (c) `public void sample(int x, int y)`
 (d) `public float sample(int p)`
- x) A class member declared as _____ can be accessed everywhere.
 (a) private (b) protected
 (c) public (d) final

Question 2

- (i) `String y [] = {"Spotify", "Google Maps", "Telegram", "Instagram"};`
`System.out.println (y[0].length () + y[1].length ());`
`System.out.println (y[3].substring (5));` [2]

(ii) String x = "Cloud Computing"; [2]

System.out.println(x.lastIndexOf('u') + x.indexOf('o'));

System.out.println(x.startsWith("cloud"));

(iii) Give the output of the following Java statements. [2]

1. String s = "Today is Thursday";

System.out.println(s.indexOf('T'));

2. "ELEPHANT".replace('E', 'A').toLowerCase()

(iv) Give the output of the following code: [2]

String A = "26", B = "1003";

String D = A + B + "2003";

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);

v) If int n[] = {1, 2, 3, 5, 7, 9, 13, 16}, what are the values of x and y? [2]

x = Math.pow(n[4], n[2]);

y = Math.sqrt(n[5] + n[7]);

vi) Consider the following code and answer the questions that follow:

```
class academic
```

```
{
```

```
static int x;
```

```
int y;
```

```
void access()
```

```
{
```

```
int a, b;
```

```
academic student = new academic();
```

```
System.out.println("Object created");
```

```
}
```

```
}
```


- (i) What is the object name of class academic ?
- (ii) Name the class variable and local variable used in the program.
- (vii) Mention the return data type and argument data type of the following methods:- [2]
- startsWith()
 - isLetterorDigit()
- viii) State a difference between call by value and call by reference. (Write only two points) [2]
- ix) Differentiate between Binary Search and Linear Search. [2]
- x) Write any two advantages of using arrays. [2]

Section - B [60 Marks]

(Attempt any four questions from this Section)

[The answers in this Section should consist of the Programs in either BlueJ environment or any program environment with Java as the base.

Each program should be written using Variable descriptions/ Mnemonic Codes so that the logic of the program is clearly depicted.]

QUESTION 1.

Create a class **Salary_calc** that is described below: [15]

Class Name: Salary_calc

Data members: name, basic

Member methods:

- Salary_calc(): default constructor.
- void input(): to input the name and basic salary using scanner class
- void SalaryCal(): to calculate the allowances and salaries as given:
 $DA = 25\% \text{ of basic salary}$, $HRA = 20\% \text{ of basic salary}$
 $gross = basic + DA + HRA$, $PF = 18\% \text{ of basic}$
 $netSalary = gross - PF$, $AnnualSal = 12 \text{ months' netSalary}$
- void display(): to print the name and other results with suitable heading

QUESTION 2

Hero Honda has increased the cost of its vehicles as per the type of the engine using the following criteria: [15]

Type of Engine	Rate of increment
2 stroke	10% of the cost
4 stroke	12% of the cost

Write a program by using a class to find the new cost as per the given specifications:

Class name: Honda

Data Members	Purpose
int type	To accept type of engine 2 stroke or 4 stroke(However if user enter another value for given stroke display wrong choice)
int cost	To accept previous cost

Member Methods	Purpose
void gettype()	To accept the type of engine and previous cost
void find()	To find the new cost as per the criteria given above
void printcost()	To print the type and new cost of the vehicle

QUESTION 3

[15]

Define a class to accept 10 students UID numbers and their corresponding names in two different single dimensional arrays. Search for an UID number input by the user and display the corresponding student name along with the UID number. If not found, display appropriate error message (Linear search technique.)

[15]

QUESTION 4

Define a class to initialize the given list of prime numbers in an array and search for a prime number input by the user and display the position if found in the array, otherwise display the message "Data not found" using Binary search technique.

Prime No's: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37

QUESTION 5

Design a class to overload a function **joyString()** as follows: [15]

- (i) void joyString(String s, char ch1, char ch2)- with one string argument and two character arguments that replaces the character argument ch1 with the character argument ch2 in the given string s and prints the new string.

Sample Input

s= "TECHNALAGY"

ch1 = 'A'

ch2 = 'O'

OUTPUT: "TECHNOLOGY"

- (ii) void joyString(String s)- with one string argument that prints the position of the first space and the last space of the given string s.

Sample Input

s = "Cloud computing means Internet-based computing"

OUTPUT:

First index: 5

Last index: 36

(iii) void joyString(String s1, String s2)- with two string arguments that combines the two strings with a space between them and prints the resultant string.

Sample Input

s1 = "COMMON WEALTH"

s2 = "GAMES"

OUTPUT:

COMMON WEALTH GAMES

(use library functions)

QUESTION 6

Write a program to input 15 integer elements into a Single Dimensional array and sort them in ascending order using the **bubble sort technique**. [15]