

COMPUTER APPLICATIONS : 2021

SECTION A (40 Marks)

Question 1

[5x2=10]

- (a) Define Unicode.
- (b) Identify the following conversions as Autoboxing or Unboxing:
 - (i) Conversion of an Integer to an int.
 - (ii) Conversion of an int to an Integer.
- (c) Name the following literals:
 - (i) "ICSE"
 - (ii) '+'
 - (iii) 254
 - (iv) false
- (d) Mention the two types of comments used in Java.
- (e) Rewrite the following using for loop:
int x = 10, y = 5;
do{
 x++;
 y--;
} while(x <= 15);
System.out.println(x + y);

Question 2

[5x2=10]

- (a) Name the following:
 - (i) Parameters present in the method call statement.
 - (ii) Smallest individual unit of a program.
- (b) State the purpose of the following methods:
 - (i) compareToIgnoreCase()
 - (ii) trim()
- (c) What is a constructor?
- (d) Write a prototype of the method show() which receives a string and an integer as arguments and returns a character.
- (e) State the output of the following program segment:
int n = 47389, d;
while(n > 10)
{
 d = n % 10;
 System.out.println(d);
 n = n / 100;
}
System.out.println(n);

Question 3

[10x2=20]

- (a) Differentiate between the methods indexOf() and lastIndexOf().
- (b) What is the value of y after evaluating the expression given below?
y += ++y + -y + y--; when int y = 5;
- (c) Give the output of the following statements:
System.out.println("Good".concat("Day"));
System.out.println("MERRYWORLD".substring(0, 5));
System.out.println("My_dream".length());
System.out.println("Memory".startsWith("Me"));
- (d) Write the output of the following statements:
System.out.println("result 1 = " + 6 + 2);
System.out.println("result 2 = " + (6 + 2));

- (e) Write the return data type of the following methods of Character class:
- (i) isLetter()
 - (ii) toUpperCase()
- (f) Predict the output of the following:
- (i) `Math.sqrt(196) + Math.pow(49, 0.5);`
 - (ii) `Math.floor(17.9) + Math.ceil(-17.5);`
- (g) What will be the output when the following code segment is executed?
- ```
int x = 5;
char ch = 'C';
int y = ch + 5;
System.out.println(y + " " + (char)y);
```
- (h) What is the value of x and y in the following statements?
- ```
int a = 63, b = 36;
(i) boolean x = (a < b)? true : false;
(ii) int y = (a < b)? a : b;
```
- (i) What are library classes? Give an example.
- (j) Write a Java expression for the following:

Answer:

$$\frac{ax^2 + by}{2ab}$$

SECTION B (60 Marks)

Question 4

[15]

Design a class Hotel with the following description:

Member variables: String name – to store the name of the customer

long mno – to store the mobile number of the customer

double bill – to store the bill amount

double gst – to store the GST amount

double st – to store the service tax

double tamt – to store the total amount to be paid by the customer

Member methods:

void accept() – to accept customer's name, mobile number and bill amount.

void calculate() – to calculate GST, service tax and total amount to be paid by the customer.

gst = 18% on bill

st = 12.5% on bill

tamt = bill + gst + st

void display() – to display the customer's name, mobile number, GST, service tax and total amount.

Write a main() method to create an object and invoke the above member methods.

Question 5

[15]

Write a program to input n number of integer elements in an array and sort them in descending order using bubble sort technique and print the sorted list.

Question 6

[15]

Write a menu-driven program using switch case to accept a choice from the user and according to the choice entered perform the following operations:

- (a) To calculate and display the area of a circle using the formula: $\text{Area} = (\pi \times \text{radius}^2)$ where $\pi = 22 / 7$
 - (b) To calculate and display the area of a rectangle using the formula: $\text{Area} = (\text{length} \times \text{breadth})$
 - (c) To calculate and display the area of a triangle using the formula: $\text{Area} = 1 / 2 \times \text{base} \times \text{height}$
 - (d) To calculate and display the area of a square using the formula: $\text{Area} = \text{side}^2$
- For an incorrect option, an appropriate error message should be displayed.

Question 7**[15]**

Design a class to overload a method called pattSeries() as follows:

(a) void pattSeries() – To generate and display the pattern given below:

5 4 3 2 1

4 3 2 1

3 2 1

2 1

1

(b) void pattSeries(int n) – To find and display the sum of the series given below:

$$sum = \frac{1}{3} + \frac{2}{4} + \frac{3}{5} + \dots + \frac{n}{(n+2)}$$

Write a main() method to create an object of the class and call the above member methods.

Question 8**[15]**

Write a program to input a number and check and print whether it is an EvenPal number or not.

The number is said to be an EvenPal number when the number is a palindrome number and the sum of its digits is an even number.

Example:

Number 121 is a palindrome number and the sum of its digits is $1 + 2 + 1 = 4$, which is an even number.

Therefore, 121 is an EvenPal number.

Question 9**[15]**

A list contains marks in the subject Computer Applications for 'N' number of students. Write a program to create an array of size 'N' and store the marks. Check and print the number of students falling into the different ranges given below:

100 – 80

79 – 60

59 – 40

39 – 20

19 – 0