



ST. JOSEPH'S COLLEGE, PRAYAGRAJ
HALF YEARLY EXAMINATION 2023 - 24
COMPUTER APPLICATIONS

(Theory)
(Two hours)

Maximum Marks 100

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 (40 Marks)

Attempt all questions.

Question 1

Choose the correct answer and write the correct option.

[20]

- (i) Choose the correct output for – “KNOWLEDGE”.substring(5, 9);
a) KNOW
b) LEDG
c) EDGE
d) EDG
- (ii) Choose the correct output for – “ACHIEVEMENT”.replace('E', 'A');
a) ACHIAVAMANT
b) ACHIAVEMENT
c) ACHIEVEMANT
d) ECHIEVEMENT
- (iii) Choose the correct output for – “DEDICATE”.compareTo(“DEVOTE”);
a) 18
b) -18
c) 0
d) 2
- (iv) A function in java can be written:
a) Inside a class
b) Outside a class
c) Inside main() function
d) Inside package
- (v) A user defined function can have _____ number of parameters.
a) 1
b) 2
c) 3
d) any number





- (vi) Java constructor is like a method without _____ .
- Argument list
 - Return type
 - Statements
 - Any method name
- (vii) Corresponding wrapper class of int data type is _____ .
- integer
 - INTEGER
 - Int
 - Integer
- (viii) When primitive data type is converted to its corresponding object of its class, it is called as _____ .
- Autoboxing
 - Unboxing
 - Implicit type conversion
 - Explicit type conversion
- (ix) Each primitive data type has its own specific _____ .
- Object
 - Class
 - Wrapper class
 - Block
- (x) State the value of x after the following is executed:
char p = 'A';
x = Character.isLetterOrDigit(p);
- false
 - a
 - 65
 - true
- (xi) Operators with higher precedence are evaluated before operators with relatively lower precedence. Arrange the operators given below in order of higher precedence to lower precedence.
- (i) && (ii) % (iii) >= (iv) ++
- (iv), (i), (iii), (ii)
 - (iv), (iii), (ii), (i)
 - (iv), (ii), (iii), (i)
 - (i), (ii), (iii), (iv)
- (xii) Name the type of error in the statement given below:
int r=100/0;
- Syntax
 - Runtime
 - Logical
 - None of these
- (xiii) What value will Math.sqrt (Math.ceil (15.3)) return?
- 16.0
 - 16
 - 4.0
 - 4

- (xiv) The absence of which statement leads to fall through situation in switch case statement?
- continue
 - break
 - return
 - System.exit(0)
- (xv) The number of bits occupied by the value 'a' are:
- 1 bit
 - 2 bits
 - 4 bits
 - 16 bits
- (xvi) Name the type of error, if any in the following statement:
System.out.print("HELLO")
- logical
 - runtime
 - syntax
 - no error
- (xvii) Among the following which is a keyword:
- exit
 - case
 - goto
 - All of these
- (xviii) The expression which uses >= operator is known as:
- assignment
 - arithmetic
 - relational
 - logical
- (xix) Assertion (A): static method can access static and instance variables.
Reason (R): static variable can be accessed only by static method.
- (A) and (R) both are true
 - (A) is true and (R) is false
 - (A) is false and (R) is true
 - (A) and (R) both are false
- (xx) Assertion (A): we need not to create object for static method in java.
Reason (R): static method belongs to a class, not to the instance of the class.
- (A) is false and (R) is true
 - (A) is true and (R) is false
 - (A) and (R) both are true
 - (A) and (R) both are false

Question 2

- a) Give the output of the following program segment: [2]

```
int n = 4279, d;
while(n>0)
{
    d=n%10;
    System.out.println(d);
    n=n/100;
}
```



b) How many times will the following loop execute? What value will be returned? [2]

```
int x=2, y=50;
do
{
    ++x;
    y -= x++;
}while(x<=10);
System.out.println(y);
```

c) What will be the output of the following code? [2]

```
int m=2, n=15, i;
for(i=1;i<5;i++)

    m++;
    --n;
    System.out.println("m="+m);
    System.out.println("n="+n);
```

d) Write the Java expression for $-(p + q + r)^f$ and $\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ [2]

e) Evaluate the expression when the value of $y = 8$: [2]

```
y+= ++y + y-- + --y;
```

Question 3

a) Define *Wrapper Class* with an example. [2]

b) What do you understand by *compound statement*? Give an example [2]

c) Difference between *instance variable* and *class variable*. [2]

d) Explain the purpose of *break* and *continue* in programming with an example. [2]

e) Define *null loop* with an example. [2]

SECTION B (60 Marks)

Attempt any four questions from this Section.

The answers in this Section should consist of the Programs in either Blue J environment or any program environment with Java as the base. Each program should be written using Variable descriptions/Mnemonic Codes such that the logic of the program is clearly depicted.

Flow-Charts and Algorithms are not required.

Question 4

An air-conditioned bus charges fare from the passengers based on the distance travelled as per the tariff given below: [15]

Distance Travelled	Fare
Upto 10 km	only fixed charge ₹80
11 km to 20 km	₹6 per km + fixed charge ₹80
21 km to 30 km	₹5 per km + fixed charge ₹80
31 km and above	₹4 per km + fixed charge ₹80

Write a program in java to enter distance travelled by the passenger. Calculate and display the fare to be paid.



Question 5

[15]

Write a program in java to enter a number and check whether the number is **Beam Number** or not. A **Beam Number** is a number in which the sum of the squares of the digits of the number is larger than the number itself.

Example:

Input: Enter a number: 25

Output: 25 is Beam Number. ($2^2+5^2 = 4+25 = 29$, 29 is greater than 25)

Question 6

[15]

Write a program in java to input a sentence in uppercase. Count and print the pairs of vowels and number of pair of vowels occurring in the sentence.

Example:

Input: BEAUTIFUL INDIAN COUPLES

Output: Pair of vowels: EA, AU, IA, OU

Number of pairs of vowels: 4

Question 7

[15]

Write a program in java to create a class to overload a method **series()** as follows:

double series(double n) with one double parameter and returns the sum of the series.

$sum = (1/1) + (1/2) + (1/3) + \dots + (1/n)$

double series(double a, double n) with two double parameter and returns the sum of the series.

$sum = (1/a2) + (4/a5) + (7/a8) + (10/a11) + \dots$ to **n** terms.

Write **main()** method to call above methods to enable the task.

Question 8

[15]

Write a program in java to input a sentence in uppercase and frame a word by adding the first letter of each word and also arrange the letters of the new word in an alphabetical order. Display the new word and arranged word with proper message.

Example:

Input: MR. NARENDRA DAMODAR DAS MODI IS THE PRIME MINISTER OF INDIA

Output: The new word is: MNDDMITPMOI

Arranged in alphabetical order: DDIIMMMNOPT

Question 9

[15]

Write a program in java to create a class with the following specification:

Class name: Pay

Data members/Instance variables:

String name;

float salary, da, hra, gross;

Member Methods:

void inputData(): to input name and salary of an employee.

void calculate(): to find the following:

da = 15% of the salary.

hra = 10% of the salary.

gross = salary + da + hra

void outputData(): to display all the information.

Write **main()** method to call above methods to enable the task.