

COMPUTER APPLICATIONS

Maximum Marks: 100

Time allowed: Two hours

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 from this Section.)*

Question 1

[20]

Choose the correct answers to the questions from the given options.

(Do not copy the questions, write the correct answers only.)

- (i) A mechanism where one class acquires the properties of another class:
- (a) Polymorphism
 - (b) Inheritance
 - (c) Encapsulation
 - (d) Abstraction
- (ii) Identify the type of operator **&&**:
- (a) ternary
 - (b) unary
 - (c) logical
 - (d) relational

This paper consists of 8 printed pages.

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Turn Over

- (iii) The Scanner class method used to accept words with space:
- (a) next()
 - (b) nextLine()
 - (c) Next()
 - (d) nextString()
- (iv) The keyword used to call *package* in the program:
- (a) extends
 - (b) export
 - (c) import
 - (d) package
- (v) What value will `Math.sqrt (Math.ceil (15.3))` return?
- (a) 16.0
 - (b) 16
 - (c) 4.0
 - (d) 5.0
- (vi) The absence of which statement leads to *fall through* situation in switch case statement?
- (a) continue
 - (b) break
 - (c) return
 - (d) `System.exit(0)`
- (vii) State the type of loop in the given program segment:
- ```
for (int i = 5; i != 0; i - = 2)
 System.out.println(i);
```
- (a) finite
  - (b) infinite
  - (c) null
  - (d) fixed

- (viii) Write a method prototype name **check()** which takes an integer argument and returns a char:
- (a) char check()
  - (b) void check (int *x*)
  - (c) check (int *x*)
  - (d) char check (int *x*)
- (ix) The number of values that a method can **return** is:
- (a) 1
  - (b) 2
  - (c) 3
  - (d) 4
- (x) Predict the output of the following code snippet: String P = "20", Q ="22";
- ```
int a = Integer.parseInt(P);  
int b = Integer.valueOf(Q);  
System.out.println(a+" "+b);
```
- (a) 20
 - (b) 20 22
 - (c) 2220
 - (d) 22
- (xi) The String class method to **join** two strings is:
- (a) concat(String)
 - (b) <string>.joint(string)
 - (c) concat(char)
 - (d) Concat()
- (xii) The output of the function "COMPOSITION".substring(3, 6):
- (a) POSI
 - (b) POS
 - (c) MPO
 - (d) MPOS

- (xiii) `int x = (int) 32.8;` is an example of _____ typecasting.
- (a) implicit
 - (b) automatic
 - (c) explicit
 - (d) coercion
- (xiv) The code obtained after *compilation* is known as:
- (a) source code
 - (b) object code
 - (c) machine code
 - (d) java byte code
- (xv) Missing a semicolon in a statement is what type of error?
- (a) Logical
 - (b) Syntax
 - (c) Runtime
 - (d) No error
- (xvi) Consider the following program segment and select the output of the same when `n = 10` :
- ```
switch(n)
{ case 10 : System.out.println(n*2);
 case 4 : System.out.println(n*4); break;
 default : System.out.println(n);
}
```
- (a) 20  
40
  - (b) 10  
4
  - (c) 20, 40
  - (d) 10  
10

- (xvii) A method which does not *modify* the value of variables is termed as:
- (a) Impure method
  - (b) Pure method
  - (c) Primitive method
  - (d) User defined method
- (xviii) When an object of a Wrapper class is converted to its corresponding primitive data type, it is called as \_\_\_\_\_.
- (a) Boxing
  - (b) Explicit type conversion
  - (c) Unboxing
  - (d) Implicit type conversion
- (xix) The number of *bits* occupied by the value 'a' are:
- (a) 1 bit
  - (b) 2 bits
  - (c) 4 bits
  - (d) 16 bits
- (xx) Method which is a part of a *class* rather than an instance of the class is termed as:
- (a) Static method
  - (b) Non static method
  - (c) Wrapper class
  - (d) String method

## Question 2

- (i) Write the Java expression for  $(a + b)^x$ . [2]
- (ii) Evaluate the expression when the value of  $x = 4$ : [2]
- $x * = - - x + x++ + x$

- (iii) Convert the following do...while loop to for loop: [2]
- ```
int x=10;
do
{ x--;
System.out.print(x);
}while (x>=1);
```
- (iv) Give the output of the following Character class methods: [2]
- (a) Character.toUpperCase ('a')
- (b) Character.isLetterOrDigit('#')
- (v) Rewrite the following code using the if-else statement: [2]
- ```
int m= 400;
double ch = (m>300) ? (m / 10.0) * 2: (m / 20.0) - 2;
```
- (vi) Give the output of the following program segment: [2]
- ```
int n = 4279; int d;
while(n>0)
{ d=n%10;
System.out.println(d);
n=n/100;
}
```
- (vii) Give the output of the following String class methods: [2]
- (a) "COMMENCEMENT" . lastIndexOf('M')
- (b) "devote" . compareTo("DEVOTE")
- (viii) Consider the given array and answer the questions given below: [2]
- ```
int x[]={4,7,9,66,72,0,16};
```
- (a) What is the length of the array?
- (b) What is the value in x[4]?
- (ix) Name the following: [2]
- (a) What is an instance of the class called?
- (b) The method which has same name as that of the class name.

(x) Write the value of  $n$  after execution: [2]

```
char ch ='d';
```

```
int n = ch + 5;
```

### SECTION B (60 Marks)

(Answer **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 description / mnemonic codes so that the logic of the program is clearly depicted.*

*Flowcharts and algorithms are not required.*

#### Question 3

[15]

Design a class with the following specifications:

Class name:

**Student**

Member variables:

name – name of student

age – age of student

mks –marks obtained

stream – stream allocated

(Declare the variables using appropriate data types)

Member methods:

void **accept()** – Accept name, age and marks using methods of Scanner class.

void **allocation()** – Allocate the stream as per following criteria:

| mks                    | stream                |
|------------------------|-----------------------|
| $\geq 300$             | Science and Computer  |
| $\geq 200$ and $< 300$ | Commerce and Computer |
| $\geq 75$ and $< 200$  | Arts and Animation    |
| $< 75$                 | Try Again             |

void **print()** – Display student name, age, mks and stream allocated.

Call all the above methods in main method using an object.

#### Question 4

[15]

Define a class to accept 10 characters from a user. Using **bubble sort** technique arrange them in ascending order. Display the sorted array and original array.

### Question 5

[15]

Define a class to overload the function **print** as follows:

void **print**() to print the following format

```
1 1 1 1
2 2 2 2
3 3 3 3
4 4 4 4
5 5 5 5
```

void **print**(int n)

To check whether the number is a lead number. A lead number is the one whose sum of even digits are equal to sum of odd digits.

e.g. 3669 odd digits sum =  $3 + 9 = 12$

even digits sum =  $6 + 6 = 12$

3669 is a lead number.

### Question 6

[15]

Define a class to accept a String and print the number of digits, alphabets and special characters in the string.

Example: S = "KAPILDEV@83"

Output: Number of digits – 2

Number of Alphabets – 8

Number of Special characters – 1

### Question 7

[15]

Define a class to accept values into an array of double data type of size 20. Accept a double value from user and search in the array using **linear search** method. If value is found display message "Found" with its position where it is present in the array. Otherwise display message "not found".

### Question 8

[15]

Define a class to accept values in integer array of size 10. Find sum of *one digit* number and sum of *two digit* numbers entered. Display them separately.

Example: Input: a[ ] = {2, 12, 4, 9, 18, 25, 3, 32, 20, 1}

Output: Sum of one digit numbers :  $2 + 4 + 9 + 3 + 1 = 19$

Sum of two digit numbers :  $12 + 18 + 25 + 32 + 20 = 107$