

SECOND MODEL EXAMINATION- 2019

COMPUTER APPLICATIONS

(Theory)

(Two hours)

STD: 10

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.

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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 [ ].

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SECTION A (40 Marks)

Attempt all questions

Question 1.

- a) Define Inheritance . [2]
- b) What is the scope of private access specifier? [2]
- c) What is constructor overloading ? What is the advantage of function overloading ? [2]
- d) Explain type casting with an example? [2]
- e) Why class is called an object factory ? [2]

Question 2.

- a) Name the keyword that [2]
  - i) Distinguishes between class variable and instance variable
  - ii) Instantiates an object of a class
- b) What is the data type that the following library function return ? [2]
  - i) startsWith()
  - ii) Math.random()
- c) How many bytes are occupied by the array arr[ ] given below . [2]  
int arr[ ] = {3 ,4, 5};

d) Evaluate the following : (show the working)

```
int y=4;
```

```
y -= (++y + (y -- + ++y) * y);
```

e) Write a java statement for each to perform the following task:

- i) Find the position of the last space in a string str .
- ii) Extract the second last character of the string str .

Question 3.

a) How many times will the following loop executes ? What will be the output ?

```
int x=2;
do
{
++x;
while(x++<=10);
System.out.println(x);
}while(x++<=10);
System.out.println("x="+x);
```

b) Write java expression for

$$x = \frac{\sqrt{(a+b)^n}}{a+b}$$

c) Give the output of the following java statements :

- i) `System.out.println("COMPUTER".compareTo("COMMERCE"));`
- ii) `System.out.println("COMPUTER".substring(2,4));`

d) Give the output of the following program segment :

```
double x=5.8, y= 2.4;
```

- i) `System.out.println(Math.max(Math.floor(x),y));`
- ii) `System.out.println(Math.min(Math.ceil(y),x));`

e) State the type of errors if any in the following statements:

( syntax error , logical error or runtime error)

- 1) `switch (n>2)`
- 2) `System.out.println(19/0);`

f) Differentiate between binary search and linear search techniques.

- g) Rewrite the following loop using for loop: [2]  
while(true)  
System.out.println("\*");
- f) Write the prototype of a function **test** which takes two arguments a character and a boolean and return a boolean type value. [2]
- h) Rewrite using ternary operator: [2]  
if ( salary >=60000)  
tax= 5/100.0\* salary;  
else  
tax= 0;
- i) Convert the following if else if construct into switch case [2]  
if ( ch==1 || ch==2)  
++a;  
else if (ch==3)  
++b;  
else  
++c;

### 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 an 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

A transport company charges for the parcels of its customers as per the following specification given below:

Class name: transport

Member variables : String name - to store the name of the customer  
int w - to store the weight of the parcel in Kg  
int charge - to store the charge of the parcel including surcharge.

Member functions : void accept( ) – to accept the name of the customer , weight of the parcel from the user.

void calculate( ) - to calculate the charge as per the weight of the parcel as per the following criteria .

Weight in Kg	Charge per Kg
First 10 Kgs	Rs 25 per Kg
Next 20 Kgs	Rs 20 per Kg
Above 30 Kgs	Rs 10 per Kg

A surcharge of 5% is charged on the bill

void print ( ) - to print the name of the customer , weight of the parcel , total bill inclusive of surcharge in a following format :

Name   Weight   Bill Amount

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Define a class with the above mentioned specifications , create the main method , create an object and invoke the member methods . [15]

### Question 5

Write a program to input a string and convert it into uppercase and print the pair of vowels and number of pair of vowels occurring in the string .

Sample input : "Beautiful Beauties"

Output : EA,AU,EA, AU, IE

No: of pair of vowels : 5

[15]

### Question 6

Design a class to overload a function to compute( ) as follows:

- i) int compute(int m, int g , int h ) with three integer arguments to compute Potential Energy using the formula  $PE = m \times g \times h$
- ii) double compute( int m , int v) with two integer arguments to compute Kinetic Energy using the formula  $KE = \frac{1}{2} m v^2$
- iii) double compute(int r) with one integer argument to calculate the circumference of a circle using the formula  $2\pi r$

[15]

### Question 7

Write a program to input a number and check whether the number is Harshad Number or not. A number is called Harshad , if is divisible by sum of its digits.

Example 108

Sum of the digits :  $1+0+8 =9$

$108 /9=12$

So, 108 is a harshad numbe.

[15]

### Question 8

Write a program to accept the year of graduation from school as an integer value from the user . Using binary 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".

[15]

Year of graduation : 1985,1988,1990,2000,2007,2010,2018

### Question 9

Write a menu driven program to display the pattern as per user's choice .

Pattern 1

pattern 2

@

A

@@

BC

@#@

DEF

@###@

GHIJ

@###@

KLMNO

For an incorrect choice , an appropriate error message should be displayed .

[15]