COMPUTER APPLICATIONS

(Theory)

(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.

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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 [ ].

SECTION A (40 Marks)

*Attempt **all** questions*

Question 1

(a) Mention any *two* attributes required for class declaration.

(b) State the difference between *token* and *identifier.*

(c) Explain *instance* variable. Give an example.

(d) What is *inheritance* and how is it useful in Java?

(e) Explain any *two* types of access specifier. [10]

Question 2

(a) What is meant by an *infinite* loop? Give an example.

(b) State the difference between = = *operator* and equals() *method.*

(c) Differentiate between *actual* parameter and *formal* parameter.

(d) What is the use of *exception* handling in Java?

(e) Differentiate between *base* and *derived* class. [10]

Question 3

(a) Explain the function of each of the following with an example:

(i) break;

(ii) continue; [4]

(b) Convert the following segment into equivalent *for* loop

```
{
int i, 1=0;
while (i<=20)
System.out.print( i+" ");
1++;
}
```
[2]

(c) If a = 5, b =9 calculate the value of a+ = a++ – ++b +a [2]

(d) Give the output of the following expressions.

(i) If $x = -9.99$, calculate Math.abs(x);

(ii) If $x = 9.0$, calculate Math.sqrt(x); [2]

(e) If, String x = "Computer";

String y = "Applications";

What do the following functions **return** for;

(i) System.out.printin(x.substring(l,5));

(ii) System.out.printin(x.indexOf(x.charAt(4)));

(iii) System.out.printin(y+x.substring(5));

(iv) System.out.printin(x.equals(y)); [4]

(f) If, array [] = {1,9,8,5,2};

(i) What is array.length()?

(ii) What is array[2]? [2]

(g) What does the following mean?

Employee staff = new Employee(); [2]

(h) Write a Java statement to input / read the following from the user using the keyboard.

(i) Character.

(ii) String. [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

Define a class **employee** having the following description:-

Data members/	int pan	to store personal account number
Instance variables	String name	to store name
	double taxincome	to store annual taxable income
	double tax	to store tax that is calculated
Member functions:		
input( )	Store the pan number, name, taxableincome	
calc( )	Calculate tax for an employee	
display( )	Output details of an employee	

Write a program to compute the tax according to the given conditions and display the output as per given format.

Total Annual Taxable Income	**Tax Rate**
UptoRs. 1,00,000	No tax
From 1,00,001 to 1,50,000	10% of the income exceeding Rs.1,00,000
From 1,50,001 to 2,50,000	Rs. 5000 + 20% of the income exceeding Rs.1,50,000
Above Rs.2,50,000	Rs. 25,000 + 30% of the income exceeding Rs.2,50,000.

Output :

Pan Number	**Name**	**Tax-income**	**Tax**
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	- [15]

Question 5

Write a program to input a string and print out the text with the uppercase and lowercase letters reversed, but all other characters should remain the same as before.

Example: INPUT : WelComE TO School
OUTPUT : wELcOMe to sCHOOL [15]

Question 6

Define a class and store the given city names in a single dimensional array. Sort these names in alphabetical order using the Bubble Sort technique only.

INPUT: Delhi, Bangalore, Agra, Mumbai, Calcutta
OUTPUT: Agra, Bangalore, Calcutta, Delhi, Mumbai [15]

Question 7

Write a menu driven class to accept a number from the user and check whether it is a Palindrome or a Perfect number.

(a) Palindrome number - (a number is a Palindrome which when read in reverse order is same as read in the right order)
Example: 11,101,151 etc.

(b) Perfect number - (a number is called Perfect if it is equal to the sum of its factors other than the number itself.)
Example : 6=1+2+3 [15]

Question 8

Write a class with the name **volume** using function overloading that computes the volume of a cube, a sphere and a cuboid.

Formula: volume of a cube (vc) = s*s*s
volume of a sphere (vs) = 4/3 * π * r * r * r
(where π = 3.14 or 22/7)
Volume of a cuboid (vcd) = l * b * h [15]

Question 9

Write a program to calculate and print the sum of each of the following series:

(a) Sum (S) = 2 – 4 + 6 – 8 + ...– 20

(b) Sum (S)= $\frac{x}{2}+\frac{x}{5}+\frac{x}{8}+\frac{x}{11}+.....+\frac{x}{20}$

(Value of x to be input by the user.) [15]