

COMPUTER APPLICATIONS

(THEORY)

(Two hours)

(Full 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.

- (a) Give the pictorial representation of the Java Compilation process. [2]
- (b) "Java is a Case Sensitive language" – True or False? [1]
- (c) Can there be an *if* without an *else*? Give an example. [2]
- (d) What is a loop? [2]
- (e) Find the output of the following program segments, when: (a) val = 500 (b) val = 1600 [3]
int val, sum, n = 550;
sum = n + val > 1750? 400:200;
System.out.println(sum);

Question 2.

- (a) If a = 5, b = 9, calculate the value of a + = a++ - ++b + a [2]
- (b) State one similarity and one difference between 'while' and 'for' loop. [2]
- (c) What is the use and syntax of a ternary operator? [2]
- (d) Rewrite the following program correctly: [4]

```
class Sample {  
    public void main [ ] ; {  
        x = 2  
        y = 2.2;  
        float z = x * y;  
        System.out.println("Value of x++ = " (x++)  
        system.out.println("Value of z = " + z)  
    }  
}
```

This Paper consists of 4 printed pages.

Question 3.

- (a) What is the output of the following: [3]
- (i) char c = 'A';
short m = 25;
double n = c + m;
System.out.println (n);
- (ii) int x = 10, y = 5, z;
if(x > y || x ==y)
z = ++x + --y;
System.out.println(z + " " + x + " " + y);
- (b) What is a constructor? [2]
- (c) State whether the following are true or false: [2]
- (i) "After creating an array the size cannot be altered"
- (ii) "int arr [] and int [] arr are both valid declarations"
- (d) Write a statement for each of the following: [3]
- (i) Store a number 354 as a String.
- (ii) Convert the String to a numeric value.
- (iii) Add it to the existing total of 1000 to update the total.

Question 4.

- (a) Explain the use of toUpperCase () function. Give an example. [2]
- (b) What are the types of casting shown by the following examples? [2]
- (i) double x = 15.2;
int y = (int) x;
- (ii) int x = 12;
long y = x;
- (c) What is the difference between a *break* statement and a *continue* statement when they occur in a loop? [2]
- (d) Write a Java expression for $ut + \frac{1}{2}ft^2$ [2]
- (e) The following program prints out the pattern given below: [2]

```
2  
2 4  
2 4 6  
2 4 6 8
```

Some parts of the program are marked by ?1? , ?2? ,?3? , ?4? that must be replaced by statements so that the program works correctly.

```
void whyPattern()  
{  
for(int i=?1?; i<?2?;i++)  
{  
for(int j=1;j<=?3?;j++)  
{  
System.out.print(?4?+" ");  
}  
System.out.println();  
}  
}
```

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 5.

A class Compound is created to calculate the compound interest using:

$$CI = P \left(1 + \frac{r}{100} \right)^t - P$$

Where P - is the Principal amount, r – rate of interest and t – time period in years.

Data members of class : pamt, rate (double data type to store principal amount and rate of interest), time (integer to store time period)

Functions of the class :

- (i) Compound () – constructor to assign default values to all the data members.
- (ii) void input() – to input the principal, rate and time from the user.
- (iii) double findInterest() – to find and return compound interest using the given formula.
- (iv) void printData() – to print the principal, rate and time.

Write a main function to input required data and by invoking suitable functions print the entered data and compound interest.

[15]

Question 6.

A hotel is giving seasonal discount on the total amount to be paid by the person staying at the time of check out. The charges for one day stay is ₹850.0 per room. The discount will be given as per the following criteria:

Number of days stayed	Discount on total amount
Upto 5 days	10%
> 5 days and <= 10 days	15%
> 10 days and <= 20 days	20%
More than 20 days	25%

Write a program to input name of guest, total number of days stayed in the hotel. Calculate the total amount to be paid and discount amount. Find the net balance to be paid excluding the discount. Print the bill including all the data.

[15]

Question 7.

Write a program in Java to print all the **ARMSTRONG** numbers in the range between m and n (both inclusive). The input contains two positive integers m and n, where m<n and m<3000 and n<3000.

[Note: An Armstrong number is a number which is equal to the sum of the cube of its digits]

[15]

Question 8.

Write a menu driven program to perform the following operations using switch-case.

- (a) Compute and display the sum of the following series:

$$S = \frac{x}{1} - \frac{x^2}{2} + \frac{x^3}{3} - \dots \text{ n terms}$$

- (b) Input an integer and print the sum of first and last digits of that number.

Example: **Input** : n = 8452
 Output : Sum of first and last digit = 8+2 = 10

Question 9.

- (a) Write a program to accept a String. Convert the string to **Uppercase**. Count and output the number of double letter sequences that exist in the string.

Sample Input : "SHE WAS FEEDING THE LITTLE RABBIT WITH AN APPLE"
Sample Output : 4

[7]

- (b) Write a program to accept a String and convert its into its **Piglatin** form.
To translate word into a Piglatin word, convert the word into **Uppercase** and then place the first vowel of the original word as the start of the new word along with the remaining alphabets. The alphabets present before the vowel being shifted towards the end followed by "AY".

Sample Input (1) : London, **Sample Output (1)** : ONDONLAY
Sample Input (2) : Olympics, **Sample Output (2)** : OLYMPICSAY

[8]

Question 10.

Write a menu driven program to generate a triangle or a pyramid based upon the user's choice:

(a) A
 A B
 A B C
 A B C D
 A B C D E

(b) A
 B B
 C C C
 D D D D
 E E E E E

Example 1:

Input: Type 1 for a Triangle or
 Type 2 for a Pyramid: 1
Output: A
 A B
 A B C
 A B C D
 A B C D E

Example 2:

Input: Type 1 for a Triangle or
 Type 2 for a Pyramid: 2
Output: A
 B B
 C C C
 D D D D
 E E E E E

[15]