Bethany High, Sarjapur

Grade X – Computer Application

Instructions:

- **Programs to be written in your practical record book.**
- **Print out the programs and paste or staple them in your practical record book. There's no need to write the questions.**
- **Output for each program to be written on the blank side of your record**
- **Last date of Submission: 31/10/24**

1. Accept names and marks of 10 students and print in descending order of marks using Bubble Sort.
2. Input a matrix of m rows and n columns and find the sum of each row and sum of each column.
3. Write a program to input numbers into a 3×3 integer matrix and interchange the largest number with the smallest number and display the modified matrix.

For example. if the given matrix is :

2	3	4
1	5	9
6	22	12

The resultant matrix is :

2	3	4
22	5	9
6	1	12

4. Program to check if two numbers are amicable numbers or not.
   (Amicable numbers – two numbers are Amicable if the sum of the factors of the first number is equal to the second number and the sum of the factors of the second number is equal to the first number.
   Eg: 220 and 284 are Amicable)

5. Design a class to overload a method Number( ) as follows:
   (i) **void Number (int num , int d)** - To count and display the frequency of a digit in a number.
   Example: num = 2565685 d = 5 Frequency of digit 5 = 3
   (ii) **void Number (int n1)** - To find and display the sum of even digits of a number.
   Example: n1 = 29865 Sum of even digits = 16
   Write a main method to create an object and invoke the above methods.

6. Design a class to overload a function series ( ) as follows:
   (i) void series (int x, int n) – To display the sum of the series given below:
   $x^1 + x^2 + x^3 + \ldots\ldots\ldots\ldots x^n$ term
   (ii) void series (int p) – To display the following series:
   0, 7, 26, 63 …… p terms

(iii) void series () – To display the sum of the series given below:

$$\frac{1}{2}+\frac{1}{3}+\frac{1}{4}\ldots\ldots\ldots\ldots\frac{1}{10}$$

7. Write a program to input name and percentage of 5 students of class X in two separate one dimensional arrays. Arrange students details according to their percentage in the descending order using selection sort method. Display name and percentage of first 3 toppers of the class.

8. Program to print all twin prime numbers till an accepted number n

Twin-prime : pairs of primes that differ by 2.

(For example, 3 and 5, 5 and 7, 11 and 13, and 17 and 19 are twin primes.)

9. Write a program to find the HCF and LCM of two given numbers using functions/methods.

10. Define a class CourierService with the following descriptions:

Class name : CourierService

Instance Variables/ Data Members:

String name : To store the name of the customer

String type : To store the type of parcel (Ordinary/Express)

int weight : to store the weight of the parcel

double charge : to store the calculated charges

Member methods:

CourierService ( ) : default constructor to initialize all the instance variables.

void accept( ) : To accept the name of the customer, type and weight of the parcel

void calculate( ) :To calculate the charges as per the following tariff:

void print( ) : To display the details

Weight in Kgs	**Charge Ordinary**	**Charge Express**
Upto 10	Rs. 800	Rs. 1500
11 – 20	Rs. 1500	Rs. 3000
Above 20	Rs. 4000	Rs. 5500

Write a main method to create an object of the class and call the above member methods

11. Define a class to accept a number and check whether it is a Disarium Number.
A number is said to be the Disarium number when the sum of its digit raised to the power of their respective positions is equal to the number itself from left to right
Input : n = 135
Output : Yes
$1^1 + 3^2 + 5^3 = 135$
Therefore, 135 is a Disarium number

12. Write a program to accept a string. Convert the string into upper case letters. 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

13. 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

14. Write a program to input a String check and display whether it is a Unique word or not. A word is said to be unique if the letters are not repeated in the string, i.e., all the letters are different
Example : COMPUTER
Output : Unique Word
Example : APPLE
Output : Not a Unique Word

15. Define a class to accept the names of 10 students in an array and check for the existence of the given name in the array using linear search, if found print the position of the name, if not found print the appropriate message. Also print the names which begin with the word “ADI.”

16. Define a class to declare a character array of size ten, accept the character into the array and perform the following:

• Count the number of uppercase letters in the array and print.

• Count the number of vowels in the array and print.

17. Define and write a program for class to overload the method print as follows:

void print ()- to print the format

1

2 3

4 5 6

7 8 9 10

boolean print (int n)- to check whether the number is a Dudency number,

a number is dudency if the cube of the sum of the digits is equal to the number itself.

Eg: 512=(5+1+2)3 = (8)3=512

void print (int a, char ch) -

if ch=s or S print the square of the number else if ch=c or C print the cube of the number.

18. Define a class called with the following specifications:

Class name: Eshop

Member variables:

String name : name of the item purchased

double price : Price of the item purchased

Member methods:

void accept(): Accept the name and the price of the item using the methods of Scanner class.

void calculate(): To calculate the net amount to be paid by a customer, based on the following criteria:

Price	**Discount**
1000 – 25000	5.0%
25001 – 57000	7.5 %
57001 – 100000	10.0%
More than 100000	15.0 %

void display() : To display the name of the item and the net amount to be paid.

Write the main method to create an object and call the above methods.

19. Write a program to input a string and display the new string after removing the vowels from it.

Sample Input: INTERNET WORLD **Output** : NTRNT WRLD

20. For the given numbers, search for 56 using binary search technique.

If found, display: Search successful, data found in ___ index.

If not found, display: search not successful.

12, 34, 56, 78, 90, 99, 120, 140, 167,450,899