Project Work

Computer Applications

(Write variable Descriptions/Mnemonics)

Question 1

Define a class named FruitJuice with the following description:

Data Members	Purpose
int product_code	stores the product code number
String flavour	stores the flavour of the juice (e.g., orange, apple, etc.)
String pack_type	stores the type of packaging (e.g., tera-pack, PET bottle, etc.)
int pack_size	stores package size (e.g., 200 mL, 400 mL, etc.)
int product_price	stores the price of the product

Member Methods	Purpose
FruitJuice()	constructor to initialize integer data members to 0 and string data members to ""
void input()	to input and store the product code, flavour, pack type, pack size and product price
void discount()	to reduce the product price by 10
void display()	to display the product code, flavour, pack type, pack size and product price

Question 2

Define a class Bill that calculates the telephone bill of a consumer with the following description:

Data Members	Purpose
int bno	bill number
String name	name of consumer
int call	no. of calls consumed in a month
double amt	bill amount to be paid by the person

Member Methods	Purpose
Bill()	constructor to initialize data members with default initial value
Bill(...)	parameterised constructor to accept billno, name and no. of calls consumed
Calculate()	to calculate the monthly telephone bill for a consumer as per the table given below
Display()	to display the details

Units consumed	Rate
First 100 calls	₹0.60 / call
Next 100 calls	₹0.80 / call
Next 100 calls	₹1.20 / call
Above 300 calls	₹1.50 / call

Fixed monthly rental applicable to all consumers: ₹125

Create an object in the main() method and invoke the above functions to perform the desired task.

Question 3

Write a program to input a number. Use a function int Armstrong(int n) to accept the number. The function returns 1, if the number is

Armstrong, otherwise zero(0).
Sample Input: 153
Sample Output: $153 \Rightarrow 1^3 + 5^3 + 3^3 = 153$
It is an Armstrong Number.

Question 4

Write a class with the name Area using function overloading that computes the area of a parallelogram, a rhombus and a trapezium.

Formula:

Area of a parallelogram (pg) = base * ht

Area of a rhombus (rh) = (1/2) * d1 * d2
(where, d1 and d2 are the diagonals)

Area of a trapezium (tr) = (1/2) * (a + b) * h
(where a and b are the parallel sides, h is the perpendicular distance between the parallel sides)

Question 5

Write a class with the name Perimeter using function overloading that computes the perimeter of a square, a rectangle and a circle.

Formula:

Perimeter of a square = 4 * s

Perimeter of a rectangle = 2 * (l + b)

Perimeter of a circle = 2 * (22/7) * r

Question 6

n air-conditioned bus charges fare from the passengers based on the distance travelled as per the tariff given below:

Distance Travelled	Fare
Up to 10 km	Fixed charge ₹80
11 km to 20 km	₹6/km
21 km to 30 km	₹5/km
31 km and above	₹4/km

Design a program to input distance travelled by the passenger. Calculate and display the fare to be paid.

Question 7

Write a menu driven program to calculate:

1. Area of a circle = $p*r^2$, where p = (22/7)
2. Area of a square = side*side
3. Area of a rectangle = length*breadth

Enter 'c' to calculate area of circle, 's' to calculate area of square and 'r' to calculate area of rectangle.

Question 8

Write a program to input a number and check and print whether it is a Pronic number or not. [Pronic number is the number which is the product of two consecutive integers.]
Examples:
12 = 3 * 4
20 = 4 * 5
42 = 6 * 7

Question 9

prime number is said to be 'Twisted Prime', if the new number obtained after reversing the digits is also a prime number. Write a program to accept a number and check whether the number is 'Twisted Prime' or not.
Sample Input: 167
Sample Output: 761
167 is a 'Twisted Prime'.

Question 10

A special two-digit number is such that when the sum of its digits is added to

the product of its digits, the result is equal to the original two-digit number.

Example: Consider the number 59.
Sum of digits = 5 + 9 = 14
Product of digits = 5 * 9 = 45
Sum of the sum of digits and product of digits = 14 + 45 = 59

Write a program to accept a two-digit number. Add the sum of its digits to the product of its digits. If the value is equal to the number input, then display the message "Special two—digit number" otherwise, display the message "Not a special two-digit number".

Question 11

Write a program to input a number. Check and display whether it is a Niven number or not. (A number is said to be Niven which is divisible by the sum of its digits).

Example: Sample Input 126
Sum of its digits = 1 + 2 + 6 = 9 and 126 is divisible by 9.

Question 12

Write a program to accept a list of 20 integers. Sort the first 10 numbers in ascending order and next the 10 numbers in descending order by using 'Bubble Sort' technique. Finally, print the complete list of integers.

Question 13

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

Question 14

Write a program in Java to store 20 numbers in a Single Dimensional Array (SDA). Display the numbers which are prime.

Question 15

The class teacher wants to store the marks obtained in English, Maths and Science of her class having 40 students. Write a program to input marks in Eng, Science and Maths by using three single dimensional arrays. Calculate and print the following information:
(i) Average marks secured by each student.
(ii) Class average in each subject.
[**Hint:** Class average is the average marks obtained by 40 students in a particular subject.]

----
xxxxxxxxxxxxxxxxxxxxxxxxxxxx---