SUBJECT	PROJECT WORK
English language	1. Write an original short story with the title 'The Hunt'. 2. Write a letter to your friend explaining him/her about your anxiousness before ICSE.
English literature	a. Give an account of the character of Portia in the play- ' The Merchant Of Venice' b. Write about the central theme of the poem-'Abou Ben Adhen'. c. Write about the central theme of the story- 'All Summer in a Day'.

History	Present a life sketch and contributions of any one of the following: (Presidents of India)
	     i. Dr. Rajendra Prasad
	     ii. Dr. S. Radha Krishnan
	     iii. Dr. A. P. J. Abdul Kalam

Geography	Transport in India. Definition, importance, types, advantages and dis advantages. (Paste pictures)
Mathematics	Topic 1- Survey different types of bank account, rates of interest offers (no need to visit any bank physically, you can do the survey online) Topic 2 – Conduct a survey in your locality without visiting any places physically; survey the mode of conveyance / price of various essential commodities/ favorite sports. Represent the data using a bar graph / histogram and estimate the mode.
Physics	Topic 1- Refraction of light through a prism Topic 2 -Determine the focal length of a convex lens by the distance object method Topic 3 –Demonstration of resonance by using two identical tuning forks and two separate sound boxes. Topic 4 – Determine the V. R and M.A of any pulley system

Chemistry	i) Action of heat on the following substances-
	     a) Copper Carbonate, Zinc Carbonate.
	     b) Zinc nitrate, Copper Nitrate, Lead Nitrate.
	         Make observations, identify the products and make deductions where possible
	 ii) Add concentrated Hydrochloric acid to each of the given substance, worm, make observations, identify any product and make deduction (a) Copper oxide (b) manganese di oxide.

Biology	I) Identification and location of selected endocrine glands, adrenal, pancreas, thyroid and pituitary glands with the help of a model or chart.

	II) Experiments on photosynthesis <u>a)</u> To show the necessity of light, carbon dioxide and chlorophyll for photosynthesis. <u>b) To show the release of oxygen during photosynthesis using hydrilla.</u>
Commerce	1. From daily newspaper which your family buys select ten different advertisements. Compare each of them with the essential of a good advertisement you read, Note down how many requires are fulfilled by each advertisement. Is the advertisement which fills maximum number of requirements the most popular/effective? 2. Prepare a list of all the expenses which you have incurred on your studies during the last one year. Classify these expenses into direct and indirect category. Which category is higher in amount and why? 3. A large business house has several factories which produce fast moving consumer goods. It has its own fleet and trucks and warehouses in the different parts of the country. The business house wants to reduce cost and time involved in the distribution its products among retailers. Advise the house.
Economics	1) Explain in brief the utilization of factors of production in industries. 2) Visit an online store, select five items of regular consumption. Study the following: The impact of GST on those five productions, how this has impacted the demand for these products, how it has benefitted the producer, consumer and government.
Hindi	Topic 1 – 'Netaji ka chasma' k rachna kar ka parichay dete huye kahani ka saransh apne sabd me likhiye. Topic 2 – kisibhi chitra ko dekh kr uske upor apna bichar ya koi moulik kahani apne sabd me likhiye tatha jis chitra ko dekh kr apna rachna kar hehe hai.us chitra ko bhi file main chipka dijiyega. (300 se 400 tak sabdme)
Bengali	Language – Write a picture composition (approximately 300 to 400 words) Literature – Write a summary of the story 'Lalu'. From the text book

	'Sankalita'

Art application	Project **1 –** 1. Copy painting from master artist.
	              2. Relief work (Plaster of Paris / terra cotta)
	              3. Cartoon drawing and portrait drawing or painting.
	              4. Creative photography.

Physical Education	Identify the 'Body Type' you have narrate the common traits found in your category of 'Body Type'. Which type of sports (Cricket, Football) can you excel? Discuss.
Home science	a. food preservation and storage (preparation of pickles) b. food plan (a day's sample plan for yourself) c. Collection of samples of fabrics and comparing them on the basis of cost, durability, appearance and suitability. d. Collection of five play materials and evaluating them in terms of their merits and demerits.
Computer Application	**Question 1.** Define a class named Book Fair with the following description: Instance variables/data members: String b Name: stores the name of the book. double price: stores the price of the book. Member methods: BookFair(): default constructor to initialize data members. void input(): to input and store the name and the price of the book. void calculate(): to calculate the price after discount. Discount is calculated based on the following criteria: PRICE DISCOUNT Less than or equal to Rs. 1000 2% of price More than Rs. 1000 and less than or equal to Rs. 3000 10% of price More than Rs. 3000 15% of price void display(): to display the name and price of the book after discount. Write a main() method to create an object of the class and call the above member functions. **Question 2.** Using the switch statement, write a menu-driven program for the following: (i) To print the Floyd's triangle given below: 1 2 3 4 5 6

7 8 9 10
11 12 13 14 15
(ii) To display the following pattern:
I
IC
ICS
ICSE
For an incorrect option, an appropriate error message should be displayed.

Question 3.
Design a class to overload a function sumSeries() as follows:
(i) voidsumSeries(int n, double x): with one integer argument and one double argument to find and display the sum of the series given below:
s = x / 1 – x / 2 + x / 3 – x / 4 + x / 5 … N terms.
(ii) voidsumSeries(): to find and display the sum of the following series:
s = 1 + (1 × 2) + (1 × 2 × 3) + … + (1 × 2 × 3 × 4 … × 20)

Question 4.
Write a program to accept a number and check and display whether it is a Niven number or not.
Niven number is that number which is divisible by its sum of digits.
Example:
Consider the number 126.
Sum of its digits is 1 + 2 + 6 = 9, and 126 is divisible by 9.

Question 5.
Write a program to initialize the seven Wonders of the World along with their locations in two different arrays. Search for a name of the country input by the user. If found, display the name of the country along with its Wonder, otherwise display "Sorry not found!".
Seven Wonders: CHICHEN ITZA, CHRIST THE REDEEMER, TAJ MAHAL, GREAT WALL OF CHINA, MACHU PICCHU, PETRA, COLOSSEUM
Locations: MEXICO, BRAZIL, INDIA, CHINA, PERU, JORDAN, ITALY

Question 6.
Define a class ElectricBill with the following specifications:
class: ElectricBill
Instance variables/data members:
String n: to store the name of the customer.
int units: to store the number of units consumed.
double bill: to store the amount to be paid.
Methods:
void accept(): to accept the name of the customer and number of units consumed.
void calculate(): to calculate the bill as per the following tariff:

Number of units – Rate per unit

First 100 units – Rs. 2.00

Next 200 units – Rs. 3.00

Above 300 units – Rs. 5.00

A surcharge of 2.5% charged if the number of units consumed is above 300 units.

void print(): To print the details as follows:

Name of the customer: _____

Number of units consumed: _____

Bill amount: _____

Write a main() method to create an object of the class and call the above member functions.

Question 7.

Write a program to accept a number and check and display whether it is a spy number or not. A number is spy if the sum of its digits equals the product of its digits.

Example: Consider the number 1124.

Sum of the digits = 1 + 1 + 2 + 4 = 8.

Product of the digits = 1 × 1 × 2 × 4 = 8.

Question 8.

Using switch statement, write a menu-driven program for the following:

(i) To find and display the sum of the series given below:

S = x1 – x2 + x3 – x4 + x5 … – x20, where x = 2.

(ii) To display the following series:

1 11 111 1111 11111

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

Question 9.

Write a program to input integer elements into an array of size 20 and perform the following operations:

Display the largest number from the array.

Display the smallest number from the array.

Display sum of all the elements of the array.

Question 10.

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

void check(String str, char ch) – to find and print the frequency of a character in a string.

Example:

INPUT:

str = "success"

ch = 's'

OUTPUT:

Number of s present is = 3.

void check(String s1) – to display only vowels from s1, after converting it to lowercase.

Example:

INPUT:

s1 = "computer"

OUTPUT:

o u e

Question 11.

Write a program to input ten integers in an array in ascending order in an array. Now input another integer number and check whether it is present in the array or not using binary search technique.

Question 12.

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:

$12 = 3 \times 4$

$20 = 4 \times 5$

$42 = 6 \times 7$

Question 13.

Write a program in Java to accept a string in lowercase and change the first letter of every word to uppercase. Display the new string.

Sample INPUT: we are in cyber world

Sample OUTPUT: We Are In Cyber World

Question 14.

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

(i) double volume(double r) – with radius 'r' as an argument, returns the volume of sphere using the formula:

$v = 4 / 3 \times 22 / 7 \times r3$

(ii)double volume(double h, double r) – with height 'h' and radius 'r' as the arguments, returns the volume of a cylinder using the formula:

$v = 22 / 7 \times r2 \times h$

(iii) double volume(double l, double b, double h) – with length 'l', breadth 'b' and height 'h' as the arguments, returns the volume of a cuboid using the formula:

$v = l \times b \times h$

Question 15.

Write a program to accept name and total marks of N number of students in two single subscripts array name[] and totalmarks[].

Calculate and print:

(i) The average of the total marks obtained by N number of students.

[average = (sum of total marks of all the students) / N]

(ii) Deviation of each student's total marks with the average.

[deviation = total marks of a student – average]

Question 16.

Design a class named ShowRoom with the following description:

Instance variables/data members:

String name: to store the name of the customer.

longmobno: to store the mobile number of the customer.

double cost: to store the cost of the items purchased.

double dis: to store the discount amount.

double amount: to store the amount to be paid after discount.

Member methods:

ShowRoom(): default constructor to initialize data members.

void input(): to input customer name, mobile number, cost.

void calculate(): to calculate discount on the cost of purchased items, based on the following criteria:

COST
            DISCOUNT (IN PERCENTAGE)

Less than or equal to Rs. 10000	5%
More than Rs. 10000 and less than or equal to Rs. 20000	10%
More than Rs. 20000 and less than or equal to Rs. 35000	15%
More than Rs. 35000	20%

void display(): to display customer name, mobile number, amount to be paid after discount.

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

Question 17.

Write a program to input 15 integer elements in an array and sort them in ascending order using the Selection sort technique.

Question 18.

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

(a) void series(int x, int n): to display the sum of the series given below:

x1 + x2 + x3 + … + xn terms

(b) void series(int p): to display the following series:

0, 7, 26, 63, … p terms.

(c) void series(): to display the sum of the series given below:

1/2 + 1/3 + 1/4 + … + 1/10

Question 19.

Write a program to input a sentence and convert it into uppercase and count and display the total number of words starting with the letter 'A'.

Example:

Sample Input: ADVANCEMENT AND APPLICATION OF INFORMATION TECHNOLOGY ARE EVER CHANGING.

Sample Output: Total number of words starting with letter 'A' = 4.

Question 20.

A tech number has even number of digits. If the number is split in two equal halves, then the square of sum of these halves is equal to the number itself. Write a program to generate and print all four digits tech numbers.

Example:

Consider the number 3025.

Square of sum of the halves of 3025 = $(30 + 25)^2 = (55)^2$

= 3025 is a tech number.

Question 21.

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

(i) void joyString(String s, char ch1, char ch2) with one string argument and two character arguments that replaces the character argument ch1 with the character argument ch2 in the given string s and prints the new string.

Example:

INPUT:

s = "TECHNALAGY"

ch1 = 'A'

ch2 = 'O'

OUTPUT:

"TECHNOLOGY"

(ii) voidjoyString(String s) with one string argument that prints the position of the first space and the last space of the given string s.

Example:

INPUT:

s = "Cloud computing means Internet-based computing"

OUTPUT:

First index: 5

Last index: 36

(iii) voidjoyString(String s1, String s2) with two string arguments that combines the two strings with a space between them and prints the resultant string.

Example:

INPUT:

s1 = "COMMON WEALTH"

s2 = "GAMES"

OUTPUT:

COMMON WEALTH GAMES

Question 22.

Write a program to input twenty names in an array. Arrange these names in descending order of alphabets, using the bubble sort technique.

Question 23.

Using the switch statement, write a menu-driven program to:

(i) To find and display all the factors of a number input by the user (including 1 and excluding the number itself).

Example:

INPUT:

n = 15

OUTPUT:

1, 3, 5

(ii) To find and display the factorial of a number input by the user. The factorial of a non-negative integer n, denoted by n!, is the product of all integers less than or equal to n.

Example:

INPUT:

n = 5

OUTPUT:

5! = 1 × 2 × 3 × 4 × 5 = 120.

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

Question 24.

A company manufactures packing cartons in four sizes, i.e. cartons to accommodate 6 boxes, 12 boxes, 24 boxes and 48 boxes. Design a program to accept the number of boxes to be packed (N) by the user (maximum up to 1000 boxes) and display the break-up of the cartons used in descending order of capacity (i.e. preference should be given to the highest capacity available, and if boxes left are less than 6, an extra carton of capacity 6 should be used.)

Example:

INPUT : N = 140

OUTPUT :

48 X 2 = 96

24 x 1 = 24

12 x 1 = 12

6 x 1 = 6

Remaining boxes 2 x 1 = 2

Total number of boxes = 140

Total number of cartons = 6

Question 25.

The names of the teams participating in a competition should be displayed on a banner vertically, to accommodate as many teams as possible in a single banner.

Design a program to accept the names of N teams, where 2 < N < 9 and display them in vertical order, side by side with a horizontal tab (i.e.,

eight spaces).
Example:
INPUT: N = 3
Team 1: Emus
Team 2: Road Rols
Team 3: Coyote
OUTPUT:

E	R	C
M	O	O
S	D	O
		T
	R	E
	O	
	I	
	S	

Question 26.
An Evil number is a positive whole number which has even number of 1's in its binary equivalent. Example: Binary equivalent of 9 is 1001, which contains even number of 1's. Thus, 9 is an Evil Number. A few Evil numbers are 3, 5, 6, 9.... Design a program to accept a positive whole number 'N' where N>2 and N<100. ><100. Find the binary equivalent of the number and count the number of 1s in it and display whether it is an Evil number or not with an appropriate message. Test your program with the following data and some random data:

Question 27.
The potential of a word is found by adding the ASCII value of the alphabets. (ASCII values of A to Z are 65 to 90). Example: BALL Potential = 66 + 65 + 76 + 76 = 283 Write a program to accept a sentence which may be terminated by either " . " , " ? " or " ! " only. The words of sentence are separated by single blank space and are in UPPER CASE. Decode the words according to their potential and arrange them in ascending order of their potential strength. Test your program with the following data and some random data:
Example:
INPUT: HOW DO YOU DO?
OUTPUT:
HOW = 238 DO = 147 YOU = 253 DO = 147
DO DO HOW YOU

Question 28.
Write a program that reads two integer numbers as input and check and print whether they are twin prime numbers or not. Twin Primes are consecutive prime numbers whose difference is 2.Example 3 and 5.

Question 29.

Write a program to accept a sentence which may be terminated by either '.', '?', or '!' only. The words may be separated by more than one blank space and are in UPPER CASE.

Perform the following tasks:

(a) Find the number of words beginning and ending with a vowel.

(b) Place the words which begin and end with a vowel at the beginning, following by the remaining words as they occur in the sentence.

Example:

Input: ANAMIKA AND SUSAN ARE NEVER GOING TO QUARREL ANYMORE.

Output : NUMBER OF WORDS BEGINNING AND ENDING WITH A VOWEL = 3

ANAMIKA ARE ANYMORE AND SUSAN NEVER GOING TO QUARREL

Question 30.

Write a program to accept the numbers M and N from the user and print the smallest required number whose sum of all its digits is equal to N. Also, print the total number of digits present in the required number. Given two positive numbers M and N, such that M is between 100 and 10000 and N is less than 100. Find the smallest integer that is greater than M and whose digits add up to N. For example, if M = 100 and N = 11, then the smallest integer greater than 100 whose digits add up to 11 is 119.required number.

Example

INPUT :M = 100

N = 11

OUTPUT :

The required number = 119

Total number of digits = 3

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