PROJECT WORK – 2024–25
CLASS – XII

PROJECT WORK (SUBMISSION DATE: 1ˢᵗ July 2024

ENGLISH LANGUAGE

Length 500 words

Question 1)   Make a project on these two topics: (BOTH COMPULSORY)

(1)   Cinema influences us a lot and also the lives of famous personalities depicted in the movies/series/documentaries affect us in a big way. Some lives mould us to be enthusiastic and motivated, the others teach us what should not be done. Both try to make us better individuals. Write about any such personality (negative/positive) depicted in a biopic that you have watched recently stating what did it offer for the viewers to learn from it. (250 words)

(2)   Write a review of any of the books on fantasy category taking into view the following points: (250 words)

(i)   Title, price, publisher, cover and design.
(ii)   The contents and its critical evaluation
(iii)   Some interesting, memorable lines from the text
(iv)   Comparisons and contrasts with the other books of same genre
(v)   Final opinion/ recommendation to the readers.
Speaking skill – 5
Listening skill – 5

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ENGLISH LITERATURE

Length – 1000 to 1500 words

Question 1)   Choose any one topic and make a project on the same. (CHOOSE ONE)

(1)   In 'Macbeth' The witches constantly instigate Macbeth to do the good mischief. Why? What's the outcome.

OR

(2)   The writers often tend to use Nature and its elements to display their temperament and mood in their writings which supports the underlying theme of it. William Shakespeare brings about the stark reality of love to display his hope of a better whereas Seamus Heaney presents it with symbolism and deep meaning revealing a philosophy of life.
Bring out the similarity and the differences in their approach in treating Nature in their poems Sonnet 116 and Death of a Naturalist with special reference to their themes.
INSTRUCTIONS TO THE CANDIDATES:

(i)   The Projects are for ISC Board.
(ii)   Handwriting should be neat and clear.
(iii)   Make these Projects separately; one for language and one for literature.
(iv)   Write relevant matter and make it very creative.
(v)   Relevant pictures and quotations must be there. Pictures only on the non-ruled sheet and write on the ruled side.
(vi)   Proper heading should be written in BOLD.
(vii)   Significant lines, phrases and dialogues should be highlighted.
(viii)   Do not use red and green ink.
(ix)   Cover the projects neatly with relevant details on the cover-page itself.

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HINDI

Topic to be mentioned

Sequence-   1. आत्म परिचय,   2. विषय सूची   3. प्राक्कथन
4. विषय विस्तार   5. संदर्भ ग्रन्थ सूची

It will include.   A.   Listening Skill (Aural)
B.   Speaking Skill (Oral)
C.   Writing Skill – Literature / Language

(A)   Listening Skill (Aural) (Student need to Listen) An unseen passage of about 500 words or a poem (of appropriate length) may be read aloud, twice, the first time at normal reading speed and next time slower speed. The passage / poem may be taken from any book, newspaper, magazine and so on but not from ISCE or ISC text book.

(B)   Speaking Skill (Oral)
Students are to be assessed through an individual presentation e.g. giving a speech on a selected topic

''जीवन में खेलों का महत्व''

या

''मेरे सपनों का भारत''

(C)   Writing Skill (Literature)

Candidates will be required to undertake one written assignment of 1000-1500 words on a text / texts studied in the Literature syllabus.

''उद्यमी नर'' कविता पर आधारित लघु कथा लिखो।

या

''भक्तिन'' कहानी पर आधारित कविता लिखकर उसका विश्लेषण करो।

या

''सती'' कहानी का नाट्य रूपांतरण कीजिए।

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PHYSICS

Select any two topics from the following-

(i)   Alternating Current

(ii)   Optics: Reflection and Refraction of light, Interference, Diffraction of light.

(iii)   Electronic Devices: Semiconductor electronics.

(iv)   Communication System.

Working Model

Select any one working model from the following topics:

(i)   Prepare a Half-Wave Rectifier.

(ii)   Prepare a Full – Wave Rectifier.

(iii)   Prepare an OR / AND Gate using diodes.

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CHEMISTRY

Select any one project work from the following assignment:

1.   (a)   Chemicals in food and medicines; Preservatives, artificial sweetening agents, antioxidants, analgesics, tranquilizers, antiseptics, antimicrobials, antifertility, antibiotics, antacids, antihistamines, vitamins and hormones.

     (b)   Preparation of soap, nail polish, boot polish, varnish, nail polish remover, shampoo and perfumes.

2.   (a)   Polymers: Classification, Preparation, uses, Structure and properties of:
(i) P.V.C. (ii) Polythene (iii) PTFE (iv) Nylon6 (v) Nylon66 (vi) Biodegradable polymer (vii) Buna- N (viii) Buna-S (ix) Natural rubber (x) Bakelite
Amino acids: Peptides, structure and classification, Proteins structure and there role in the growth of living beings.

     (b)   Vitamins: Classification and functions. Vitamin A, B, C, D and K. Deficiency diseases.

3.   (a)   Nucleic acid: DNA and RNA
Basic unit: Purines and pyrimidine bases, double helix structure of DNA.

     (b)   Carbohydrate and their metabolism, blood- haemoglobin and respiration.

     (c)   Chemicals and chemical process in forensic studies.

     (d)   How plastic have changed the world, both socially and economically.

     (e)   Organic chemistry in Nutrition, Food science and Biotechnology.

Note: *Pictures are required on every pages as per given topic.*

Working Model:

Make any one working model from the following:

➢   Making of Rayon fibre

➢   LPG leakage Detector

➢   Electrochemical cell.

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BIOLOGY

Topic I

Choose **any one** from the following topics:

(i)   Genetic disorders

(ii)   Gene therapy

(iii)   Role of micro-organisms in industry

(iv)   Assisted reproductive technologies

(v)   Mutation – Causes and its types.

Topic II

Prepare a Working model on **any one** of the following:
(i)   Biogas plant
                   OR
(ii)   Structure of DNA

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MATHEMATICS

Candidates will be expected to have completed two projects, one from Section A and one from either Section B or Section C.

Section – A

For a given function, give the geometrical interpretation of Mean value Theorems. Explain the significance of closed and open intervals for continuity and differentiability properties of the theorems.

OR

Explain the concept of increasing and decreasing functions, using geometrical significance of dy/dx. Illustrate with proper examples.

Section – B

Using vector algebra, find the area of a parallelogram / triangle. Also, derive the area analytically and verify the same.

OR

Describe the geometrical interpretations of scalar triple product and for a given data, find the scalar triple product.

Section – C

Draw a rough sketch of cost (C), Average cost (AC) and Marginal cost (MC).
Give their mathematical interpretation using the concept of increasing – decreasing functions and maxima minima.

OR

Using any suitable data, find the optimum cost in the manufacturing problem by formulating a linear programming problem (LPP)

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COMPUTER SCIENCE

Question 1)   For adding two binary numbers, the following rule is applied:
0+0=0

0+1=1

1+0=1

1+1=0 and 1(carry)

Write a program to input decimal numbers m, n (m>0, n>0 and they are long integer type). Convert these decimal numbers into its equivalent binary numbers. Add these binary numbers and print their sum in binary form .Your program should run on following sample data and some other random data.
The output should be exactly in the same form as given.
Sample Input:
Enter Decimal Integers
M=14
N=10
Sample Output:
Binary of 14=1110
Binary of 10=1010

Sum of 1110 and 1010=11000

Question 2)   The consecutive prime numbers are known as Prime Triplets if they satisfy the following condition:
(n,n+2,n+6) are all prime numbers OR (n,n+4,n+6) are all prime numbers. Where n is an integer number >0 if(n=5 then 5,7(5+2=7),11(5+6=11).Here 5,7, and 11 all are prime numbers so(5,7,11) are prime triplets.
If n=7, then 7, 9(7+2=9), 13(7+6=13) are prime numbers. Hence 7, 9 and 13 all are not prime numbers so (7, 9, 13) are not the prime triplets.
But, if n=7 then 11(7+4=11|) and 13(7+6=13) are primer numbers. Here 7, 11 and 13 all are prime numbers so (7, 11, 13) are the prime triplets.
Write a program to input a start limits (>0) and a last limit (>0).Print all prime triplets between S and L with suitable error message. The prime triplets may be greater or be less than L depending upon the conditions used for generating prime numbers

combination. Print the total number of prime triplets at the end. Check your program for the following sample data and some   random data.

Input:
S=3
L=15
Output

Prime triplets		
5	7	11
7	11	13
11	13	17
13	17	19
Total prime triplet combinations are =4		

Question 3) A unique-digit integer is a positive integer (without leading zeros) with no duplicates digits. For example 7, 135, 214 are all unique-digit integers whereas 33, 3121, 300 are not. Given two positive integers m and n, where m < n, write a program to determine how many unique-digit integers are there in the range between m and n (both inclusive) and output them. The input contains two positive integers m and n. Assume m < 30000 and n < 30000. You are to output the number of unique-digit integers in the specified range along with their values in the format specified below:

Sample Input:
m = 100
n = 120
Sample Output:
The Unique-Digit integers are:
102, 103, 104, 105, 106, 107, 108, 109, 120.
Frequency of unique-digit integers is : 9

Sample Input:
m = 2500
n = 2550
Sample Output:
The Unique-Digit integers are:
2501, 2503, 2504, 2506, 2507, 2508, 2509, 2510, 2513, 2514, 2516, 2517, 2518, 2517, 2530, 2519, 2530, 2531, 2534, 2536, 2537, 2538, 2539, 2540, 2541, 2543, 2546, 2547, 2548, 2549.
Frequency of unique-digit integers is: 28.

Question 4) Given the two positive integers p and q where p<q .Write a program to determine how many Smith numbers are there in the range between p and q (both inclusive) and output them. The input contains two positive integers p and q. Assume that p<5000 and q<5000.You are to output the number of Smith numbers in the specified range along with their values in the format specified below.
The following steps can be used to check whether a number is Smith number or not:
A Smith number is a composite number, the sum of whose digits is the sum of the digits of its prime factors obtained as a result of prime factorization (excluding 1)
Input: -   666
Sum of the digits 6+6+6=18
Prime factors are 2,3,37
Sum of the digits of the factors: 2+3+3+ (3+7) =18
Thus, 666 is a Smith number.
Output: -   It is Smith number
Example 1:
INPUT: p=1
q=100
Output:
The Smith Numbers are:
4, 22, 27,58,85,94
Frequency of Smith number is: 6
Example 2:
INPUT: p=100
q=500
Output:
The Smith Numbers are:
121,166,202,265,274,319,346,355,378,382,391,438,454,483
Frequency of Smith number is: 14

Question 5) A company manufacturing 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 breakup 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 1:
    INPUT: N=726

OUTPUT:	48 X 15	=	720
	6 X 1	=	6
Remaining Boxes		=	0
Total number of boxes		=	726
Total number of cartons		=	16

Example 2:
    INPUT: N=140

OUTPUT:	48 X 2	=	96
	24 X 1	=	24
	12 X 1	=	12
	6 X 1	=	6
Remaining Boxes	2 X1	=	2
Total number of boxes		=	140
Total number of cartons		=	6

Question 6) A Goldbach number is a positive even integer that can be expressed as the sum of two odd primes.

    Note: All even integer numbers greater than 4 are Goldbach numbers.
    Example:
    6 = 3 + 3
    10 = 3 + 7
    10 = 5 + 5
    Hence, 6 has one odd prime pair 3 and 3. Similarly, 10 has two odd prime pairs, i.e. 3 and 7, 5 and 5.
    Write a program to accept an even integer 'N' where N > 9 and N < 50. Find all the odd prime pairs whose sum is equal to the number 'N'.
    Test your program with the following data and some random data:

    Example 1

    INPUT:
    N = 14

    OUTPUT:
    PRIME PAIRS ARE:
    3, 11
    7, 7

    Example 2

    INPUT:
    N = 30

    OUTPUT:
    PRIME PAIRS ARE:
    7, 23
    11, 19
    13, 17

    Example 3
    INPUT:
    N = 17

    OUTPUT:
    INVALID INPUT. NUMBER IS ODD.

    Example 4

    INPUT:
    N = 126

OUTPUT:
INVALID INPUT. NUMBER OUT OF RANGE.

Question 7) 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.
Write a program to accept the numbers M and N from the user and print the smallest required number whose sum of all the digits is equal to N. Also print the total number of digits presents in the required number. The program should check for the validity of the inputs and display an appropriate message for an invalid input.

Example 1
INPUT: M=100
            N=11
OUTPUT: The required number=119
            Total Number of digits=3

Example 2:
INPUT: M=1500
            N=25
OUTPUT: The required number=1699
            Total Number of digits=4

Question 8) Write a program which first inputs two integers, the first between 1 to 12 (both inclusive) and second between 0 to 59(both inclusive) and prints out the time they represent, in words. Your program should follow the format of the above examples.
Sample data
Input: 3, 0
Output: 3:00 Three O'clock
Input: 12, 1
Output: One minute past Twelve.
Input: 6:34
Output: Twenty six minutes to Seven

Question 9) A Prime-Adam integer is a positive integer (without leading zeros) which is a prime as well as an Adam number.
Prime number: A number which has only two factors, i.e. 1 and the number itself.
Example: 2, 3, 5, 7 … etc.
Adam number: The square of a number and the square of its reverse are reverse to each other.
Example: If n = 13 and reverse of 'n' = 31, then,
$(13)^2$ = 169
$(31)^2$ = 961 which is reverse of 169
thus 13, is an Adam number.
Accept two positive integers m and n, where m is less than n as user input. Display all Prime-Adam integers that are in the range between m and n (both inclusive) and output them along with the frequency, in the format given below:
Test your program with the following data and some random data:

Example 1

INPUT:
m = 5
n = 100

OUTPUT:
THE PRIME-ADAM INTEGERS ARE:
11 13 31
FREQUENCY OF PRIME-ADAM INTEGERS IS: 3

Example 2

INPUT:
m = 100
n = 200

OUTPUT:
THE PRIME-ADAM INTEGERS ARE:
101 103 113
FREQUENCY OF PRIME-ADAM INTEGERS IS: 3

Example 3

INPUT:
m = 50
n = 70

OUTPUT:
THE PRIME-ADAM INTEGERS ARE:
NIL
FREQUENCY OF PRIME-ADAM INTEGERS IS: 0

Example 4

INPUT:
m = 700
n = 450

OUTPUT:
INVALID INPUT

Question 10) Write a program to accept a date in the string format dd/mm/yyyy and accept the name of the day on 1st of January of the corresponding year. Find the day for the given date.

Example:

Input:
Date: 5/7/2001
Day on 1st January : MONDAY

Output:
Day on 5/7/2001 : THURSDAY

Run the program on the following inputs:

Input Date	Day on 1st January	Output day for
04/9/1998	THURSDAY	FRIDAY
31/8/1999	FRIDAY	TUESDAY
06/12/2000	SATURDAY	WEDNESDAY

The program should include the part for validating the inputs namely the date and day on 1st January of that year.

Question 11) The encryption of letters are to be done as follows:
A = 1
B = 2
C = 3 . . .
Z = 26
The potential of a word is found by adding the encrypted value of the letters.

Example: KITE
Potential = 11 + 9 + 20 + 5 = 45

Accept a sentence which is terminated by either " . " , " ? " or " ! ". Each word of sentence is separated by single space. Decode the words according to their potential and arrange them in ~~alphabetical~~ ~~order~~ increasing order of their potential. Output the result in the format given below:

Example 1

Input:
THE SKY IS THE LIMIT.

Potential:
THE = 33
SKY = 55

IS = 28
THE = 33
LIMIT = 63

Output:
IS THE THE SKY LIMIT

Example 2

Input:
LOOK BEFORE YOU LEAP.

Potential:
LOOK = 53
BEFORE = 51
YOU = 61
LEAP = 34

Output:
LEAP BEFORE LOOK YOU

Question 12) Write a program in Java to display all magic umbers from m to n. When the successive sum of all the digit of a number gives 1 then that number is called magic number.

For example 298 = 2+9+8 =19
1+9 =10
1+0= 1 so 298 is a magic number
INPUT m: 6
INPUT n: 4
OUTPUT: Wrong input (n can not be smaller than m);
INPUT m: 1
INPUT n: 5
OUTPUT: Wrong input (no magic number exists');
INPUT m: 100
INPUT n: 200
OUTPUT: 100,109,118,127,136,145,154,163,172,181,190,199

Question 13) A Circular Prime is a prime number that remains prime under cyclic shifts of its digits. When the leftmost digit is removed and replaced at the end of the remaining string of digits, the generated number is still prime. The process is repeated until the original number is reached again.

A number is said to be prime if it has only two factors 1 and itself.

Example:
131
311
113
Hence, 131 is a circular prime.

Accept a positive number N and check whether it is a circular prime or not. The new numbers formed after the shifting of the digits should also be displayed.

Test your program with the following data and some random data:

Example 1
INPUT:
N = 197

OUTPUT:
197
 971
 719
 197 IS A CIRCULAR PRIME.

Example 2
INPUT:
N = 1193

OUTPUT:
1193
1931
9311
3119
1193 IS A CIRCULAR PRIME.

Example 3

INPUT:
N = 29

OUTPUT:
29
92
29 IS NOT A CIRCULAR PRIME.

Question 14) 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 task

(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 ,followed by the remaining words as they occur in the sentence.

Example 1
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

Example 2
Input: LOOK BEFORE YOU LEAP.
Output: NUMBER OF WORDS BEGINNING AND ENDING WITH A VOWEL=0
LOOK BEFORE YOU LEAP.

Question 15) A wondrous square is an n by n grid which full fills the following conditions:

1. **It contains integers from 1 to n^2, where each integer appears only once.**
2. **The sum of integers in any row or column must add up to 0.5 x n x (n^2 + 1).**

For example, the following grid is a wondrous square where the sum of each row or column is 65 when n=5.

17	24	1	8	15
23	5	7	14	16
4	6	13	20	22
10	12	19	21	3
11	18	25	2	9

Write a program to read n (2 <= n <= 10) and the values stored in these n by n cells and output if the grid represents a wondrous square.

Also output all the prime numbers in the grid along with their row index and column index as shown in the output. A natural number is said to be prime if it has exactly two divisors. For example, 2, 3, 5, 7, 11 The first element of the given grid i.e. 17 is stored at row index 0 and column index 0 and the next element in the row i.e. 24 is stored at row index 0 and column index 1.

Test your program for the following data and some random data:

Input:
n = 4

16	15	1	2
6	4	10	14
9	8	12	5
3	7	11	13

Output:
Yes, it represents a wondrous square

Prime	Row Index	Column Index
2	0	3
3	3	0
5	2	3
7	3	1
11	3	2
13	3	3
15	0	1

Input:
n = 3

1	2	4
3	7	5
8	9	6

Output:
Not a wondrous square

Prime	Row Index	Column Index
2	0	1
3	1	0
5	1	2
7	1	1

Input:
n = 2

2	3
3	2

Output: Not a wondrous square

Prime	Row Index	Column Index
2	0	0
2	1	1
3	0	1
3	1	0

Question 16) Write a program to declare a square matrix A [] [] of order N (N<20)
Allow the user to input positive integers into this matrix. Perform the following tasks on the matrix:
a) **Output the original matrix.**
b) **Find the Saddle point for the matrix. A saddle point is an element of the matrix such that it is the minimum element for the row to which it belongs and the maximum element for the column to which it belongs .Saddle point for a given matrix is always unique. If the matrix has no saddle point, show the message "NO SADDLE POINT".**

4	6	12
2	8	14
1	3	6

SADDLE POINT=4

Question 17

a) Write a program to declare a square matrix A[][] of order (M × M) where 'M' must be greater than 3 and less than 10. Allow the user to input positive integers into this matrix. Perform the following tasks on the matrix:

1. **Sort the non-boundary elements in ascending order using any standard sorting technique and rearrange them in the matrix.**

2. **Calculate the sum of both the diagonals.**

3. **Display the original matrix, rearranged matrix and only the diagonal elements of the rearranged matrix with their sum.**

Test your program for the following data and some random data:

Example 1

INPUT:
M = 4
9   2   1   5
8   13 8   4
15 6   3   11
7   12 23 8

OUTPUT:
ORIGINAL MATRIX
9   2   1   5
8   13 8   4
15 6   3   11
7   12 23 8
REARRANGED MATRIX
9   2   1   5
8   3   6   4
15 8   13 11
7   12 23 8

DIAGONAL ELEMENTS
9   5
  3   6
  8   13
7   8
SUM OF THE DIAGONAL ELEMENTS = 59

Example 2

INPUT:
M = 5
7   4   1   9   5
8   2   6   10 19
13 1   3   5   1
10 0   5   12 16
1   8   17 6   8

OUTPUT:
ORIGINAL MATRIX
7   4   1   9   5
8   2   6   10 19
13 1   3   5   1
10 0   5   12 16
1   8   17 6   8

REARRANGED MATRIX
7　4　1　9　5
8　0　1　2　19
13 3　5　5　1
10 6　10 12 16
1　8　17 6　8

DIAGONAL ELEMENTS
7　　　　5
　0　　2
　　　5
　　6　　12
1　　　　　8

SUM OF THE DIAGONAL ELEMENTS = 46
Example 3

INPUT:
M = 3

OUTPUT:
THE MATRIX SIZE IS OUT OF RANGE.

Question 17
b)　Write a program to declare a matrix a[][] of order (m × n) where 'm' is the number of rows and 'n' is the number of columns such that the values of both 'm' and 'n' must be greater than 2 and less than 10. Allow the user to input integers into this matrix. Perform the following tasks on the matrix:

1. **Display the original matrix.**

2. **Sort each row of the matrix in ascending order using any standard sorting technique.**

3. **Display the changed matrix after sorting each row.**

Test your program for the following data and some random data:

Example 1

INPUT:
M = 4
N = 3

ENTER ELEMENTS OF MATRIX:

11 -2　3
5　16　7
9　0　4
3　1　8

OUTPUT:
ORIGINAL MATRIX

11 -2　3
5　16　7
9　0　4
3　1　8

MATRIX AFTER SORTING ROWS

-2　3　11
5　7　16
0　4　9
1　3　8

Example 2

INPUT:
M = 3
N = 3

ENTER ELEMENTS OF MATRIX

22 5 19
7 36 12
9 13 6

OUTPUT:
ORIGINAL MATRIX

22 5 19
7 36 12
9 13 6

MATRIX AFTER SORTING ROWS

5 19 22
7 12 36
6 9 13

Example 3

INPUT:
M = 11
N = 5

OUTPUT:
MATRIX SIZE OUT OF RANGE.

Question 18) Write a program to accept a sentence which may be terminated by either **'.'** Or **'?'**only. The words are to be separated by a single blank space. Print an error message if the input does not terminate with **'.'** Or'**?'**.Perform the following task

I.   Convert the sentence in UPPERCASE.
ii.   Print the length of the sentence word wise.
iii. Sort each word of the sentence in alphabetical order without using any standard sorting technique.
iv.   Print the UPPER CASE sentence and the new sentence having each word in sorted form without the terminating character.

Example 1: INPUT: March is the month of ISC and ICSE Examinations.
OUTPUT: MARCH IS THE MONTH OF ISC AND ICSE EXAMINATIONS.
Length of the sentence word wise=9
ACHMR IS EHT HMNOT FO CIS CEIS AAEIIMNNOSTX

Question 19) A new advanced Operating System, incorporating the latest hi-tech features has been designed by Opera Computer Systems. The task of generating copy protection code to prevent software privacy has been entrusted to the Security Department. The Security Department has decided to have codes containing a jumbled combination of alternate uppercase letters of the alphabet starting from A up to K (namely among A, C, E, G, I, K). The code may or may not be in the consecutive series of alphabets. Each code should not exceed 6 characters and there should be no repetition of characters. If it exceeds 6 characters, display an appropriate error message.

Write a program to input a code and its length. At the first instance of an error display "Invalid" stating the appropriate reason. In case of no error, display the message "Valid".

Sample Data:

Input:
n=4
ABCE

Output:
Invalid! Only alternate letters permitted!

Input:
n=4
AcIK

Output:
Invalid! Only uppercase letters permitted!

Input:
n = 7

Output:
Error! Length of String should not exceed 6 characters!

Input:
n=3
ACE

Output:
Valid

Input:
n=5
GEAIK

Output:
Valid

Question 20) A square matrix is the matrix in which number of rows equals the number of columns. Thus, a matrix of order n*n is called a Square Matrix.
Write a program in Java to create a double dimensional array of size nxn matrix form and fill the numbers in a circular fashion (anticlock-wise) with natural numbers from 1 to n^2, taking n as an input. The filling of the elements should start from outer to the central cell. For example, if n=4, then n^2=16, then the array is filled as:

1 ↓	↓ 12	← 11	← 10
2 ↓	↓ 13	16 ↑	9 ↑
3 ↓	14 →	15 ↑	8 ↑
4 →	5 →	6 →	↑

Question 21) Write a program to declare a matrix A[][] of order (MxN) where 'M' is the number of rows and 'N' is the number of columns such that the value of 'M' must be greater than 0 and less than 10 and the value of 'N' must be greater than 2 and less than 6. Allow the user to input digits (0-7) only at each location, such that that each row represents an octal number.

Example
2   3   1   (decimal equivalent of 1st row =153 i.e. $2x8^2 + 3x8^1 + 1x8^0$)
4   0   5   (decimal equivalent of 1st row =261 i.e. $4x8^2 + 0x8^1 + 5x8^0$)
1   5   6   (decimal equivalent of 1st row =110 i.e. $1x8^2 + 5x8^1 + 6x8^0$)
Perform the following tasks on the matrix
a. Display the original matrix.
b. Calculate the decimal equivalent for each row and display as per the format given below

Example 1
Input: M=3
　　　　N=4

　　　　Enter elements for row 1: 1 1 3 7
　　　　Enter elements for row 2: 2 1 0 6

Enter elements for row   3: 0 2 4 5

OUTPUT:	FILLED MATRIX			DECIMAL EQUIVALENT
	1	1	3	7	607
	2	1	0	6	1094
	0	2	4	5	165

Question 22) A string is said to be valid if it contains pair of parenthesis having text / alphabet such as (TY) and the string is said to be invalid if it contains nested parenthesis such as (Y (UP)).

For   example:

SUN (A(X) RISE) BEGINS FROM (RT) EAST is an "Invalid" string because in this string nested parenthesis are present, but SUN (A) RISE BEGINS FROM (RT) EAST is a "Valid" string because there is no nested parenthesis.

Write a program to:Read a string / sentence and convert in capitals.
Check the validity of the given string.

If the string is valid, output the given string omitting the portion enclosed in brackets otherwise, output a message "Sorry, and invalid string".

Test your program for the given sample data and also some other random data:

Sample Data:
Input:
SUN   (a)   RISE   BEGINS   FROM   (RT)   EAST

Output:
SUN RISE BEGINS FROM EAST

Input:
SUN   (A   (X)   RISE)   BEGINS   FROM   (RT)   EAST

Output:
Sorry, an invalid string

Input:
COM(IPX)PUTER   IS   (MY)   JUNK   (GOOD)   SYSTEM

Output:
COMPUTER IS JUNK SYSTEM.

Question 23) The result of a quiz competition is to be prepared as follows.
The quiz has five questions with four multiple choices**(A,B,C,D)** with each question carrying 1 mark for the correct answer. Design a program to accept the number of participant's N such that N must be greater than 3 and less than 11. Create a double dimensional array of size **(NX5)** to store the answers of each participant row-wise. Calculate the marks for each participant by matching the correct answer stored in a single dimensional array of size 5.Display the scores for each participant and also the participants having the highest score.
Example 1: If the value of N=4 then the array would be

	Q1	Q2	Q3	Q4	Q5
Participant 1	A	B	B	C	A
Participant 2	D	A	D	C	B
Participant 3	A	A	A	A	C
Participant 4	A	A	B	A	C

Key to the Question

D	C	C	A	B

OUTPUT: **Scores**
Participant 1=0

Participant 2=2

Participant 3=1

Participant 4=1

Highest Scorer is Participant 2

Question 24) Write a Program in Java to input a 2-D square matrix and check whether it is a Lower Triangular Matrix or not.
Lower Triangular Matrix: A Lower Triangular matrix is a square matrix in which all the entries above the main diagonal (↘) are zero. The entries below or on the main diagonal themselves may or may not be zero.
Example:

$$\begin{bmatrix} 5 & 0 & 0 & 0 \\ 3 & 1 & 0 & 0 \\ 4 & 9 & 4 & 0 \\ 6 & 8 & 7 & 2 \end{bmatrix}$$

Question 25) The input in this question will consist of a number of lines of English text consisting of the letters of the English alphabet, the punctuation marks (') apostrophe, (.) full stop (,) comma, (;) semicolon, (:) colon and white space characters (blank, new line). Your task is to print the words of the text in reverse order without any punctuation marks other than blanks.
For example, consider the following input text:
This is a sample piece of text to illustrate this question.
If you are smart you will solve this right.
The corresponding output would read as:
right this solve will you smart are you if question this illustrate to text of piece sample a is this
Note: Individual words are not reversed.

Input Format:
This first line of input contains a single integer n (< = 20), indicating the number of lines in the input.
This is followed by lines of input text. Each line should accept a maximum of 80 characters.

Output Format:
Output the text containing the input lines in reverse order without punctuations except blanks as illustrated above.
Test your program for the following data and some random data.

Sample Data:
Input:
2
Emotions controlled and directed to work, is character.
By Swami Vivekananda.

Output:
Vivekananda Swami By character is work to directed and controlled Emotions
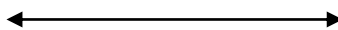
Input:
1
Do not judge a book by its cover.
Output:
cover its by book a judge not Do

Guidelines:
i) **Students have to work on project regularly through out the year according to instructions of the teacher.**
ii) **Use comments in the program wherever it is required.**
iii) **Mention the output of each program after execution of it at right place.**

←————————————→

PHYSICAL EDUCATION

Project - Prepare a file containing following points on any two games, given in your text book.
1. Brief History of the Game.
2. Interpretation of Laws.
3. Duties and responsibilities of Officials and Players.
4. Measurements and Dimensions Related to Game.
5. Terminologies

6. Fundamental Skills
7. Strategies and Formations
8. Names and Abbreviations of the National and Major International Tournaments and Governing Bodies.
9. Diagram and Dimensions of Play Area as well as Equipments of the Game.

←——————→
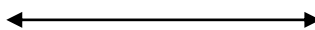
ECONOMICS

[SEQUENCE-: Name, Contents, Acknowledgement, Introduction of Project Work- *All the topics are to be mentioned*, Objectives of Project Work, Detailed Matter, Conclusion, Bibliography.]

TOPIC – I

Explain Cardinal and Ordinal Utility Analysis covering the following points in detail:-
(i)   Cardinal Utility Analysis:- meaning of utility, total utility, marginal utility, their formulas, relationship of TU and MU, Law of Diminishing Marginal Utility (schedule and diagram, Only assumptions to be taken, criticisms not required, Consumer's equilibrium-one commodity model (schedule and diagram), Law of Equimarginal Utility (statement and schedule) and conditions of consumer's equilibrium using marginal utility.
(ii) Ordinal Utility Analysis:- Indifference Curve - its meaning and properties (including MRS and DMRS), indifference map, consumer's budget line, Consumer's equilibrium- condition (to be explained with the help of diagram).
(iii) Each topic must be supported with the necessary schedule and diagram. Your one passport size photograph in school uniform should be pasted on the cover page of the file.

TOPIC – II

Prepare a report on the basic understanding of the functions of Commercial Banks, high powered money, credit creation process with limitation. The regulatory role of the Central Bank, its functions and the way it controls the flow of credit needs to be explained. A brief mention may be made of Quantitative CRR, SLR, Bank Rate Policy (Repo Rate and Reverse Repo Rate) and Open Market Operations and Qualitative Methods.
Make a comparative analysis of lending performance of five Commercial Banks in the past six years with reference to the changing CRR and SLR.

←——————→

ACCOUNTS

[SEQUENCE-: Name, Contents, Acknowledgement, Introduction of Project Work- *All the topics are to be mentioned*, Objectives of Project Work, Detailed Matter, Conclusion, Bibliography.]

TOPIC – I

Preparation of Journal / sub-division of Journal, Ledger, Trial Balance and Financial Statements of a partnership form of business on the basis of a case study.

● Develop a case study showing how two or more friends decide to come together and start a business with a certain amount of capital.

● Prepare their Partnership Deed including interest on capital, partner's salary, commission, interest on drawings, interest on partner's loan and rent paid to a partner.

● Write in detail, their transactions during the year: purchases - cash and credit, sales - cash and credit, expenses, purchase of fixed assets and depreciation charged on them, any outstanding expenses, prepaid expenses, accrued income, drawing bills of exchange, accepting bills payable etc.

● From this case study developed (which should have at least 15 transactions) pass the journal

entries, post them into the ledger, prepare a Trial Balance and the Trading and Profit and Loss

Account, Profit and Loss Appropriation Account and Balance Sheet.

● The various expenses, for comparison purposes, could be depicted in the form of bar diagrams and pie charts.

● Calculate relevant accounting ratios like liquidity, solvency, activity and profitability giving their formulae and computation (all this could be part of the viva-voce).

● The ratios could also be shown graphically and/ or pictorially (bar diagrams and pie charts) and if possible, could be compared with the ratios of the industry.

TOPIC – II

● Preparation of a Cash Flow Statement with the help of audited / unaudited / imaginary Balance Sheets of a company for two consecutive accounting years or two consecutive quarters of an accounting year could be taken along with at least five additional information (depreciation, purchase/ sale of fixed assets, dividend paid/ proposed, tax paid/ proposed, amortization of intangible assets, profit or loss on sale of fixed assets including provision for depreciation on them and profit or loss on sale of investment).

● The results of the operating, investing and financing activities could be shown graphically and/ or pictorially (bar diagrams and pie charts).

● Your one passport size photograph in school uniform should be pasted on the cover page of the file.

COMMERCE

[SEQUENCE-: Name, Contents, Acknowledgement, Introduction of Project Work- *All the topics are to be mentioned*, **Objectives of Project Work, Detailed Matter, Conclusion, Bibliography.]**

TOPIC – I

Visit a Commercial Bank. Find out the procedure to open a savings account. Find out the details of various Agency and General utility services provided by the bank.
Write a report on Banking – latest trends.
Online services- transfer of funds through Real Time Gross Settlement (RTGS), National Electronic Funds Transfer (NEFT), Immediate Payment Service (IMPS), issue of demand drafts online meaning and features.
Online Payments, e-Banking – meaning and features, advantages and disadvantages.
Mobile Banking – SMS alerts, transfer of funds, making payments – advantages and disadvantages.
Debit Cards vs Credit Cards, ATM (Automated Teller Machine) – Meaning; Debit Card and Credit Card: features and differences.
Your Photograph in the organisation should be pasted on the cover page of your file (Date and time must be mentioned on it).

TOPIC – II

Write a report on the need for consumer protection; methods of consumer protection - self-help, legislative measures and consumer associations/NGOs, Consumer Protection Act, 2019 - Rights of consumers. The Consumer Disputes Redressal Commissions (National, State and District).
Difference between Consumer Protection Act, 1986 and Consumer Protection Act, 2019.
Collect newspaper/magazine/internet clippings of five cases filed by consumers in the Consumer Court.
Find out the rights violated, and the redressal mechanism used.
What was the outcome of each case?

S.U.P.W

1. **File work:**
   Write on the following topics:
   (a) Photography
   (b) Tie and Dye
   (c) Leather Work

2. **Community Service:**
   Awareness drive on 'Small Savings'.
   Students are required to visit nearby village and contact the village leaders and people and guide them different methods of savings.
   Students are required to take one Piggy Bank to endorse and educate people about small savings.

3. **Project:**
   Students are required to make a decorative piece using Plaster of Paris/Clay.