

STEPHENS INTERNATIONAL PUBLIC SCHOOL

Holidays' Homework for Class – 12th (2019-20)

ENGLISH:

1. Department of Science and Technology, Government of India, is organizing a science exhibition in your school. Make an attractive poster announcing the event and inviting the general public to visit it.
 2. Design a poster against the ill-effects of plastics on the environment. Suggest alternative solutions as well.
 3. Jet Airlines have come up with a new airline 'Super Jet'. Draft an advertisement launching this new airline. Invent necessary details for promoting it. You can also offer attractive discounts on bookings.
 4. The ITA School of Performing Arts, Goregaon (W) Mumbai is inviting students to join. Draft a suitable commercial advertisement.
 5. Animation courses are popular as career option. Draft a suitable advertisement offering animation courses to be published in the 'educational column' of a popular newspaper.
 6. Draft a matrimonial advertisement on behalf of your neighbour who is seeking a suitable match for his physically handicapped daughter.
 7. You are Rohan/Diksha of class XII. Write an article for your school magazine in 150–200 words for your school magazine on the topic 'Aping of western culture by the younger generation'.
 8. Write an article in not more than 200 words condemning the use of furs and animal skins for making clothes and accessories. You are Bharti/Rajesh.
 9. Prepare a speech in 200-250 words on the topic 'Newspapers ought to contain more news and fewer advertisements'.
 10. Recently your town experienced a cloudburst during heavy rains. Write a newspaper report covering the incident in 150-200 words.
-

PHYSICS

- I. Solve all the textual numerical problems of the following chapters:-
 1. Electrostatics (Electric charges and fields, Electric potential and flux)
 2. Current Electricity
 3. Magnetic Effects of Current
 - II. Write down the first six practicals on your practical file.
-

CHEMISTRY

1. Make a project report of chemistry on allotted topic
 2. Solve all numericals related chapter 1 to 3.
 3. Write a short note on following topics of chapter – Chemistry in everyday life.
 - (a) Chemistry in medicines – analgesics, tranquilizers, antiseptics, disinfectants, antimicrobials, antifertility drugs, antibiotics, antacids, antihistamines.
 - (b) Chemistry in food – preservatives, artificial, sweetening agents, elementary idea of antioxidants.
 - (c) Cleansing agents – soaps and detergents, cleansing action.
-

BIOLOGY

1. Write answers to all the NCERT questions in your notes copies.
 2. Complete your practical files.
 3. Make an investigatory Biology project as directed by the teacher.
-

BUSINESS STUDIES

- Project on any product
-

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ECONOMICS

1. Calculate NVA_{FC} from the following data.

S.No.	Contents	₹ (in lakh)
1	Sales	700
2.	Purchase of machine for installation in factory	100
3.	Subsidies	50
4.	Change in stock	(-) 30
5.	Purchase of raw materials	400
6.	Rent	60
7.	Consumption of fixed capital	20

2. Calculate GNP_{FC} by

(a) Income method

(b) Expenditure method

S.No.	Contents	₹ (in crore)
1.	Net domestic capital formation	500
2.	Compensation of employees	1850
3.	Consumption of fixed capital	100
4.	Government final consumption expenditure	1100
5.	Private final consumption expenditure	2600
6.	Rent	400
7.	Dividend	200
8.	Interest	500
9.	Net exports	(-) 100
10.	Profit	1100
11.	Net factor income from abroad	(-) 50
12.	Net indirect taxes	250

3. Given the following data, find the values of 'Government final consumption expenditure' and 'Mixed income of self-employed'.

1.	National income	7100
2.	Govt. final consumption expenditure	?
3.	Gross domestic capital formation	1000
4.	Mixed income of self-employed	?
5.	Net indirect taxes	200
6.	Net factor income from abroad	100
7.	Private final consumption expenditure	4000
8.	Consumption of fixed capital	300
9.	Profits	120
10.	Wages and salaries	1500
11.	Net exports	500
12.	Operating surplus	3000

4. Write down the formula of National Income by value added method. What precautions are necessary while estimating national income by save method?
5. If the real GDP ₹ 500 and price index (base = 100) is 125, calculate Nominal GDP.
6. How 'externalities are a limitation in taking gross domestic product as an index of welfare? Explain.
7. What is the problem of double counting? How to avoid the problems relating to double counting?

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Guidelines for Project work in Economics (2019-20)

1. Every student has to compulsory undertake any **one project** on the following topics:-

- Demonetisation in India
- Rising demand for LPG in India
- Make in India – The way ahead
- Bharat Mala Project
- Contemporary employment situations in India
- Monetary policy committee and its functions
- Organic farming – Back to Nature

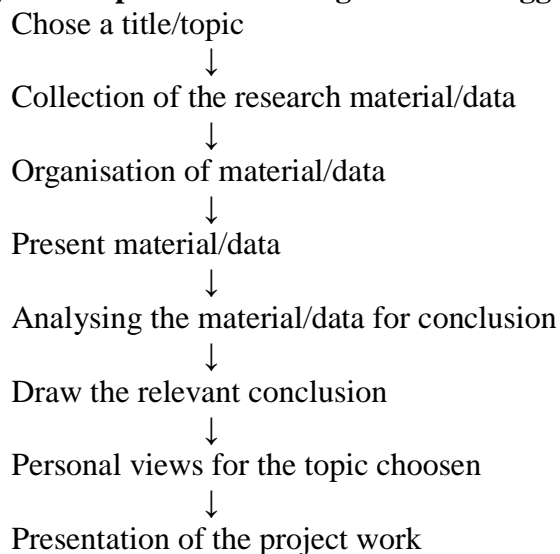
2. **Marking scheme**

S.No.	Heading	Marks allotted
1.	Relevance of the topic	3
2.	Knowledge content / Research work	6
3.	Presentation technique	3
4.	Viva – Voce	8
	Total	20 marks

3. The project should be 3500 – 4000 words. (excluding diagrams and graphs), preferably handwritten.

4. The project should be independent, self-directed piece of study.

5. Learners may work upon the following lines as a suggested flow chart:



6. **Expected checklist:-**

- Introduction of topic
- Identifying the causes, consequences, remedies
- Various stakeholders and effect on each of them
- Advantages and disadvantages of situations or issues identified
- Short term and long term implications
- Validity, reliability, appropriateness and relevance of data
- Citation of the materials referred to, in the file in footnotes, resources section, bibliography etc.

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POLITICAL SCIENCE

1. Read the chapters thoroughly.
 - (a) The End of Bipolarity
 - (b) US Hegemony in World Politics
 - (c) Politics of Planned Development
2. Prepare the chapters thoroughly. (Read & Learn)
 - (a) Cold War Era
 - (b) Challenges of Nation – Building
 - (c) Era of Our – Party Dominance
3. Prepare a project work on “the implementation of Mandal Commission report and its aftermath.
(On file)

HISTORY

- Make any one project on the following topics on scrap book at least (750- 800) words.
1. The mysteries behind the mound of dead Mohenjo-Daro.
 2. Buddha's path to enlightenment.
 3. Insight and reflection of Bernier's Nations of the Mughal Empire.
 4. “Mahatma Gandhi” - A legendary soul.
 5. Divine Apostle of Guru Nanak Dev.
 6. The process behind the framing of the Indian Constitution.
- Allocation of marks [20]
The allocation of marks is as follows:-

1.	Project synopsis	2 marks
2.	Timeline / Explanation and interpretation and map work	5 marks
3.	Visual / Overall presentation	4 marks
4.	Analysis / Data / Statistical analysis	4 marks
5.	Bibliography	1 mark
6.	Viva	4 marks
	Total	20 marks

PHE

- Prepare the practical file report in accordance with the instruction given by your PHE teacher.

APPLIED ART

1. Take a printed picture of Rajasthani, Pahari, Mughal and Deccan school of miniature painting and write their descriptions.
 2. Draw an illustration related to family and friend in daily life, games and sports, nature, national events and celebrations.
 3. Make a poster related to community and nature development, commercial products and calligraphy.
(Each topic you have to prepare four sheets).
-

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HINDUSTANI MUSIC (VOCAL)

Theory

Q:1. Write all definitions in theory notebook.

Q:2. Contribution of musicians:-

- (i) Ustad Abdul Karim Khan
- (ii) Ustad Faiyaz Khan
- (iii) Ustad Bade Ghulam Ali Khan

Practical

Q:3. Describe in detail Thah (single), Dugun (Double) with diagram.

- (i) Taal Jhaptal
- (ii) Taal Rupak
- (iii) Damar Taal
- (iv) Tilwada Taal

ACCOUNTS

→ Project with 1 comprehension problem and 2 specific problems.

Note:- All the projects should be hand written only.

Mathematics

Q:1. The function $f(x) = \begin{cases} x^2 + 3x + a, & x \leq 1 \\ bx + 2, & x > 1 \end{cases}$ is differentials at $x = 1$. Find a and b .

Q:2. The function $f(x) = \begin{cases} ax^2 - bx + 2, & x < 3 \\ bx^2 - 3, & x \geq 3 \end{cases}$ is differentiable at $x = 3$. Find a and b .

Q:3. The function $f(x) = \begin{cases} x + a\sqrt{2} \sin x, & 0 \leq x < \frac{\pi}{4} \\ 2x \cot x + b, & \frac{\pi}{4} \leq x \leq \frac{\pi}{2} \\ a \cos 2x - b \sin x, & \frac{\pi}{2} < x \leq \pi \end{cases}$ is continuous in $[0, \pi]$. Find $a + b$.

Q:4. Solve:- $\tan^{-1}(x-1) + \tan^{-1}x + \tan^{-1}(x+1) = \tan^{-1}3x$.

Q:5. Solve:- $\sin^{-1}(1-x) + \sin^{-1}x = \cos^{-1}x$.

Q:6. Solve:- $\sin^{-1}(6x) + \sin^{-1}(6\sqrt{3}x) = \frac{-\pi}{2}$

Q:7. If $\tan^{-1} \left[\frac{\sqrt{1+x^2} - \sqrt{1-x^2}}{\sqrt{1+x^2} + \sqrt{1-x^2}} \right] = \alpha$ then prove that $x^2 = \sin 2\alpha$.

Q:8. Consider $f: R_+ \rightarrow [-5, \infty)$ given by $f(x) = 9x^2 + 6x - 5$. Show that f is invertible with $f^{-1}(y) = \frac{\sqrt{y+6}-1}{3}$. Hence find (i) $f^{-1}(10)$, (ii) y if $f^{-1}(y) = \frac{4}{3}$.

Q:9. If $f, g, R \rightarrow R$ be two f^n defined as $f(x) = |x| + x$ and $g(x) = |x| - x \forall x \in R$, then $f \circ g$ and $g \circ f$. Hence find $(f \circ g)(-3)$, $(g \circ f)(-2)$.

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Q:10. Let $A = \{x \in \mathbb{Z} : 0 \leq x \leq 12\}$. Show that $R = \{(a, b) : a, b \in A, |a - b| \text{ is divisible by } 4\}$ is an equivalence relation. Find the set of all elements related to 1. Find equivalence class [2].

Q:11. Prove that $2 \tan^{-1} \frac{1}{5} + \cos^{-1} \frac{7}{5\sqrt{2}} + 2 \tan^{-1} \frac{1}{8} = \frac{\pi}{4}$.

Q:12. Solve the equation for x if $\sin^{-1} x + \sin^{-1} 2x = \frac{\pi}{3}$, $x > 0$.

Q:13. If $\sin[\cot^{-1}(x+1)] = \cos(\tan^{-1} x)$, then find x .

Q:14. Find the inverse of matrix using elementary operations.

$$A = \begin{bmatrix} 1 & 2 & -2 \\ -1 & 3 & 0 \\ 0 & -2 & 1 \end{bmatrix}$$

Q:15. Find the maximum value of $\begin{vmatrix} 1 & 1 & 1 \\ 1 & 1 + \sin \theta & 1 \\ 1 & 1 & 1 + \cos \theta \end{vmatrix}$

Q:16. If $f(x) = \begin{cases} \frac{\sin(a+1)x + 2 \sin x}{x}, & x < 0 \\ \frac{x}{2}, & x = 0 \\ \frac{\sqrt{1+bx} - 1}{x}, & x > 0 \end{cases}$ is continuous at $x = 0$ then find a and b .

Q:17. Find K if $f(x) = \begin{cases} K \sin \frac{\pi}{2}(x+1), & x \leq 0 \\ \frac{\tan x - \sin x}{x^3}, & x > 0 \end{cases}$ is continuous at $x = 0$.

Q:18. If the function $f(x) = |x-3| + |x-4|$ then show that $f(x)$ is not differentiable at $x = 3$ and $x = 4$.

Q:19. Find the values of a and b if the function f defined by $f(x) = \begin{cases} x^2 + 3x + a & \text{if } x \leq 1 \\ bx + 2 & \text{if } x > 1 \end{cases}$ is differentiable

$$a + x = 1.$$

Q:20. Find a and b if the function given by $f(x) = \begin{cases} ax^2 + b & \text{if } x < 1 \\ 2x + 1 & \text{if } x \geq 1 \end{cases}$ is differentiable at $x = 1$.

(Computer Science)

- ❖ **Revise unit 1 and unit 2 complete**
- ❖ **Make a project from the following ideas and generate synopsis and report of the project and also project file insert into the CD or Dvd or pendrive.**

- I. **Tic Tac Toe Game Project**
- II. **Banking System Project**
- III. **Library Management System Project**
- IV. **Student Report Card Project**

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- V. Supermarket Billing Project
- VI. Hangman Game Project
- VII. Casino Number Guessing Game
- VIII. Snake and Ladder Game Project
- IX. Hospital management system
- X. Hostel management system
- XI. School management system
- XII. Super Mario Game
- XIII. Cyber café management system
- XIV. Restaurant management system
- XV. Hotel management system

Answers should be screenshots taken from the laptop or computer

- ❖ For Practical work Do the following Assignments, make at least 50 programmers related to c++ programming that you were studied in 11th as well as in 12th class.

Answers should be screenshots taken from the laptop or computer

Assignments

Flow of Control

[Set – 1]

1. Any integer is input by the user. Write a program to find out whether it is an odd number or even number. .
2. Find the absolute value of a number entered by the user. .
3. Write a program to calculate the total expenses. Quantity and price per item are input by the user and discount of 10% is offered if the expense is more than 5000. .
4. Write a program to determine whether the seller has made profit or incurred loss. Also determine how much profit he made or loss he incurred. Cost price and selling price of an item is input by the user. .
5. If the ages of Ram, Sulabh and Ajay are input by the user, write a program to determine the youngest of the three. .
6. Write a program to check whether a triangle is valid or not, when the three angles of the triangle are entered by the user. A triangle is valid if the sum of all the three angles is equal to 180 degrees. .
7. Any year is input by the user. Write a program to determine whether the year is a leap year or not. .
8. In a company an employee is paid as under:
If his basic salary is less than Rs. 1500, then HRA = 10% of basic salary and DA = 90% of basic salary.
If his salary is either equal to or above Rs. 1500, then HRA = Rs. 500 and DA = 98% of basic salary.
If the employee's salary is input by the user write a program to find his gross salary. .

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9. Write a program to calculate the monthly telephone bills as per the following rule:

Minimum Rs. 200 for upto 100 calls.

Plus Rs. 0.60 per call for next 50 calls.

Plus Rs. 0.50 per call for next 50 calls.

Plus Rs. 0.40 per call for any call beyond 200 calls. .

10. Write a program to find the roots of and quadratic equation of type ax^2+bx+c where a is not equal to zero. .

11. The marks obtained by a student in 5 different subjects are input by the user. The student gets a division as per the following rules:

Percentage above or equal to 60 - First division

Percentage between 50 and 59 - Second division

Percentage between 40 and 49 - Third division

Percentage less than 40 - Fail

Write a program to calculate the division obtained by the student. .

12. Any character is entered by the user; write a program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol. The following table shows the range of ASCII values for various characters.

Characters	ASCII Values
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
special symbols	0 - 47, 58 - 64, 91 - 96, 123 – 127

Flow of Control

[Set – 2]

1. Write a program to print number from 1 to 10. .

2. Write a program to calculate the sum of first 10 natural number. .

3. Write a program to find the factorial value of any number entered through the keyboard. .

4. Two numbers are entered through the keyboard. Write a program to find the value of one number raised to the power of another. .

5. Write a program to reverses any given integer number. .

6. Write a program to sum of digits of given integer number. .

7. Write a program to check given number is prime or not. .

8. Write a program to calculate HCF of Two given number. .

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9. Write a program to enter the numbers till the user wants and at the end it should display the count of positive, negative and zeros entered. .
10. Write a program to enter the numbers till the user wants and at the end it should display the maximum and minimum number entered. .
11. Write a program to print out all Armstrong numbers between 1 and 500. If sum of cubes of each digit of the number is equal to the number itself, then the number is called an Armstrong number.
For example, $153 = (1 * 1 * 1) + (5 * 5 * 5) + (3 * 3 * 3)$.
12. Write a program to print Fibonacci series of n terms where n is input by user : 0 1 1 2 3 5 8 13 24
13. Write a program to calculate the sum of following series where n is input by user.
 $1 + 1/2 + 1/3 + 1/4 + 1/5 + \dots + 1/n$.
14. Compute the natural logarithm of 2, by adding up to n terms in the series
 $1 - 1/2 + 1/3 - 1/4 + 1/5 - \dots + 1/n$
where n is a positive integer and input by user. .

Flow of Control

[Set – 3]

1. Write a program to print following : .

i)

```
*****  
*****  
*****  
*****
```

ii)

```
*  
**  
***  
****  
*****
```

iii)

```
*  
**  
***  
****  
*****
```

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iv)

*

v)

1
222
33333
4444444
555555555

vi)

1
212
32123
4321234
543212345

2. Write a program to compute $\sin x$ for given x . The user should supply x and a positive integer n . We compute the sine of x using the series and the computation should use all terms in the series up through the term involving x^n

$$\sin x = x - x^3/3! + x^5/5! - x^7/7! + x^9/9! \dots\dots .$$

3. Write a program to compute the cosine of x . The user should supply x and a positive integer n . We compute the cosine of x using the series and the computation should use all terms in the series up through the term involving x^n

$$\cos x = 1 - x^2/2! + x^4/4! - x^6/6! \dots\dots .$$

Library Function

[Set – 1]

1. Write a program which input principal, rate and time from user and calculate compound interest. You can use library function.

$$CI = P(1+R/100)^T - P .$$

2. Write a program to compute area of triangle. Sides are input by user.

$$\text{Area} = \sqrt{s(s-a)(s-b)(s-c)}$$

$$\text{where } s = (a+b+c)/2 . .$$

3. Write a program to check character entered is alphabet, digit or special character using library functions. .

4. Write a program which display a number between 10 to 100 randomly. .

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5. Write a program which accept a letter and display it in uppercase letter. .
6. Write a C++ program to implement the Number Guessing Game. In this game the computer chooses a random number between 1 and 100, and the player tries to guess the number in as few attempts as possible. Each time the player enters a guess, the computer tells him whether the guess is too high, too low, or right. Once the player guesses the number, the game is over. .

User Defined Function

[Set – 1]

1. Write a program using function which accept two integers as an argument and return its sum. Call this function from main() and print the results in main(). .
2. Write a function to calculate the factorial value of any integer as an argument. Call this function from main() and print the results in main(). .
3. Write a function that receives two numbers as an argument and display all prime numbers between these two numbers. Call this function from main(). .
4. Raising a number to a power p is the same as multiplying n by itself p times. Write a function called power that takes two arguments, a double value for n and an int value for p, and return the result as double value. Use default argument of 2 for p, so that if this argument is omitted the number will be squared. Write the main function that gets value from the user to test power function. .
5. Write a function called zero_small() that has two integer arguments being passed by reference and sets the smaller of the two numbers to 0. Write the main program to access the function. .
6. Write the Answer of the following program :

```
#include <iostream>
using namespace std;

void X(int &A, int &B)
{
    A = A + B;
    B = A - B;
    A = A - B;
}

int main()
{
    int a = 4, b = 18;
    X(a,b);
    cout << a << ", " << b;

    return 0;
}
```

Answer

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7. Write the Answer of the following program:

```
#include <iostream>
using namespace std;

void X(int A, int &B)
{
    A = A + B;
    B = A - B;
    A = A - B;
}

int main()
{
    int a = 4, b = 18;
    X(a,b);
    cout << a << ", " << b;

    return 0;
}
```

Answer

8. Write the Answer of the following program:

```
#include <iostream>
using namespace std;

void Execute(int &B, int C = 100)
{
    int temp = B + C;
    B += temp;
    if (C == 100)
        cout << temp << " " << B << " " << C << endl;
}

int main()
{
    int M = 90, N = 10;
    Execute(M);
    cout << M << " " << N << endl;
    Execute(M, N);
    cout << M << " " << N << endl;

    return 0;
}
```

Answer

9. Give the Answer of the following program

```
#include <iostream>
using namespace std;

int global = 10;
```

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```
void func(int &x, int y)
{
    x = x - y;
    y = x * 10;
    cout << x << ", " << y << '\n';
}

int main()
{
    int global = 7;
    func (::global, global);
    cout << global << ", " << ::global << '\n';

    func(global, ::global);
    cout << global << ", " << ::global << '\n';

    return 0;
}
```

Answer

10. Write the Answer of the following program :

```
#include <iostream>
using namespace std;

static int i = 100;
void abc()
{
    static int i = 8;
    cout << "first = " << i++ << endl;
}

int main()
{
    static int i = 2;
    abc();
    cout << "second = " << i << endl;
    abc();

    return 0;
}
```

Answer

11. Write the Answer of the following program:

```
#include <iostream>
using namespace std;

int func(int &x, int y = 10)
{
    if (x % y == 0)
        return ++x;
    else
        return y--;
}
```

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```
int main()
{
    int p = 20, q = 23;

    q = func(p, q);
    cout << p << " " << " " << q << endl;

    p = func (q);
    cout << p << " " << " " << q << endl;

    q = func (p);
    cout << p << " " << " " << q << endl;

    return 0;
}
```

Answer

User Defined Function

[Set – 2]

1. Write a program that lets the user perform arithmetic operations on two numbers. Your program must be menu driven, allowing the user to select the operation (+, -, *, or /) and input the numbers. Furthermore, your program must consist of following functions:

1. Function showChoice: This function shows the options to the user and explains how to enter data.
2. Function add: This function accepts two number as arguments and returns sum.
3. Function subtract: This function accepts two number as arguments and returns their difference.
4. Function multiply: This function accepts two number as arguments and returns product.
5. Function divide: This function accepts two number as arguments and returns quotient. .

Array - Single Dimension

[Set – 1]

1. Write a C++ program to find the sum and average of one dimensional integer array. .
2. Write a C++ program to swap first and last element of an integer 1-d array. .
3. Write a C++ program to reverse the element of an integer 1-D array. .
4. Write a C++ program to find the largest and smallest element of an array. .
5. Write a menu driven C++ program with following option
 - a. Accept elements of an array
 - b. Display elements of an array
 - c. Sort the array using insertion sort method
 - d. Sort the array using selection sort method
 - e. Sort the array using bubble sort methodWrite C++ functions for all options. The functions should have two parameters name of the array and number of elements in the array. .

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6. P is one-dimensional array of integers. Write a C++ function to efficiently search for a data VAL from P. If VAL is present in the array then the function should return value 1 and 0 otherwise. .
7. Suppose a one-dimensional array AR containing integers is arranged in ascending order. Write a user-defined function in C++ to search for an integer from AR with the help of Binary search method, returning an integer 0 to show absence of the number and integer 1 to show presence of the number in the array. Function should have three parameters : (i) array AR (ii) the number to be searched and (iii) the number of elements N in the array. .
8. Suppose A, B, C are arrays of integers of size M, N, and M + N respectively. The numbers in array A appear in ascending order while the numbers in array B appear in descending order. Write a user defined function in C++ to produce third array C by merging arrays A and B in ascending order. Use A, B and C as arguments in the function. .
9. Suppose X, Y, Z are arrays of integers of size M, N, and M + N respectively. The numbers in array X and Y appear in descending order. Write a user-defined function in C++ to produce third array Z by merging arrays X and Y in descending order. .
10. Given two arrays of integers A and B of sizes M and N respectively. Write a function named MIX () with four arguments, which will produce a third array named C. such that the following sequence is followed.
All even numbers of A from left to right are copied into C from left to right.
All odd numbers of A from left to right are copied into C from right to left.
All even numbers of B from left to right are copied into C from left to right.
All old numbers of B from left to right are copied into C from right to left.
A, B and C are passed as arguments to MIX (). e.g., A is {3, 2, 1, 7, 6, 3} and B is {9, 3, 5, 6, 2, 8, 10} the resultant array C is {2, 6, 6, 2, 8, 10, 5, 3, 9, 3, 7, 1, 3}

String

[Set – 1]

1. Write a program to find the length of string. .
2. Write a program to display string from backward. .
3. Write a program to count number of words in string. .
4. Write a program to concatenate one string contents to another. .
5. Write a program to compare two strings they are exact equal or not. .
6. Write a program to check a string is palindrome or not. .
7. Write a program to find a substring within a string. If found display its starting position. .
8. Write a program to reverse a string. .
9. Write a program to convert a string in lowercase. .
10. Write a program to convert a string in uppercase. .
11. Write the Answer of the following program. Assume that all necessary header files are included.

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```
void Encrypt(char T[])
{
    for (int i = 0; T[i] != '\0'; i += 2)
        if (T[i] == 'A' || T[i] == 'E')
            T[i] = '#';
        else if (islower(T[i]))
            T[i] = toupper(T[i]);
        else
            T[i] = '@';
}

int main()
{
    char text[]="SaVE EArtH";
    Encrypt(text);
    cout << text << endl;

    return 0;
}
```

Answer

12. Write the Answer of the following program

```
int main()
{
    char name[] = "CoMPuTER";
    for (int x = 0; x < strlen(name); x++)
        if (islower(name [x]))
            name [x] = toupper(name[x]);
        else
            if (isupper(name[x]))
                if (x % 2 == 0)
                    name[x] = tolower(name[x]);
                else
                    name[x] = name[x-1];

    cout << name;

    return 0;
}
```

Answer

Array - Two Dimension

[Set – 1]

1. Write a menu driven C++ program to do following operation on two dimensional array A of size m x n. You should use user-defined functions which accept 2-D array A, and its size m and n as arguments. The options are:

- To input elements into matrix of size m x n
- To display elements of matrix of size m x n
- Sum of all elements of matrix of size m x n
- To display row-wise sum of matrix of size m x n
- To display column-wise sum of matrix of size m x n
- To create transpose of matrix B of size n x m

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2. Write user defined functions for square matrix to calculate

1. Left diagonal sum
2. Right diagonal sum

3. Write a user-defined function in C++ to display the multiplication of row element of two-dimensional array A[4][6] containing integer.

4. Write a user defined function named Upper-half() which takes a two dimensional array A, with size N rows and N columns as argument and prints the upper half of the array.

e.g.,

```
2 3 1 5 0           2 3 1 5 0
7 1 5 3 1           1 5 3 1
2 5 7 8 1 Answer will be: 1 7 8
0 1 5 0 1           0 1
3 4 9 1 5           5
```

5. Write a function in C++ which accepts a 2D array of integers and its size as arguments and displays the elements of middle row and the elements of middle column.

[Assuming the 2D Array to be a square matrix with odd dimension i.e. 3x3, 5x5, 7x7 etc...]

Example, if the array contents is

```
3 5 4
7 6 9
2 1 8
```

Answer through the function should be :

Middle Row : 7 6 9

Middle column : 5 6 1

6. Write a program to add two array A and B of size m x n.

7. Write a program to multiply array A and B of order NxL and LxM

Structure

[Set – 1]

1. Give the Answer of the following program. Assuming all the desired header files are already included, which are required to run the code.

```
struct Pixel
{
    int C, R;
};
```

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```
void Display(Pixel P)
{
    cout << "Col " << P.C << " Row " << P.R << endl;
}

int main()
{
    Pixel X = {40,50}, Y, Z;
    Z = X;
    X.C += 10;
    Y = Z;
    Y.C += 10;
    Y.R += 20;
    Z.C -= 15;
    Display(X);
    Display(Y);
    Display(Z);

    return 0;
}
```

Answer

2. Find the Answer of the following program. Assuming all the desired header files are already included, which are required to run the code.

```
struct Play
{
    int score, bonus;
};

void calculate(Play &P, int N = 10)
{
    P.score++;
    P.bonus += N;
}

int main()
{
    Play PL = {10, 15};
    calculate(PL, 5);
    cout << PL.score << ":" << PL.bonus << endl;
    calculate(PL);
    cout << PL.score << ":" << PL.bonus << endl;
    calculate(PL, 15);
    cout << PL.score << ":" << PL.bonus << endl;

    return 0;
}
```

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Answer

3. Find the Answer of the following program. Assuming all the desired header files are already included, which are required to run the code.

```
struct MyBox
{
    int length, breadth, height;
};

void dimension (MyBox M)
{
    cout << M.length << "x" << M.breadth << "x";
    cout << M.height << endl;
}

int main ()
{
    MyBox B1 = {10, 15, 5}, B2, B3;
    ++B1.height;
    dimension(B1);
    B3 = B1;
    ++B3.length;
    B3.breadth++;
    dimension(B3);
    B2 = B3;
    B2.height += 5;
    B2.length--;
    dimension(B2);

    return 0;
}
```

Answer

4. Rewrite the following program after removing the syntactical errors (if any). Underline each correction.

```
struct Pixels
{
    int color, style;
}

void showPoint(Pixels P)
{
    cout << P.color, P.style << endl;
}
```

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```
int main()
{
    Pixels Point1 = (5, 3);
    showPoint(Point1);
    Pixels Point2 = Point1;
    color.Point1 += 2;
    showPoint(Point2);

    return 0;
}
```

Answer

5. Declare a structure to represent a complex number (a number having a real part and imaginary part). Write C++ functions to add, subtract, multiply and divide two complex numbers.
6. An array stores details of 25 students (rollno, name, marks in three subject). Write a program to create such an array and print out a list of students who have failed in more than one subject.

Structure

[Set – 1]

1. Give the Answer of the following program. Assuming all the desired header files are already included, which are required to run the code.

```
struct Pixel
{
    int C, R;
};

void Display(Pixel P)
{
    cout << "Col " << P.C << " Row " << P.R << endl;
}

int main()
{
    Pixel X = {40,50}, Y, Z;
    Z = X;
    X.C += 10;
    Y = Z;
    Y.C += 10;
    Y.R += 20;
    Z.C -= 15;
    Display(X);
    Display(Y);
    Display(Z);
}
```

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```
    return 0;
}
```

Answer

2. Find the Answer of the following program. Assuming all the desired header files are already included, which are required to run the code.

```
struct Play
{
    int score, bonus;
};

void calculate(Play &P, int N = 10)
{
    P.score++;
    P.bonus += N;
}

int main()
{
    Play PL = {10, 15};
    calculate(PL, 5);
    cout << PL.score << ":" << PL.bonus << endl;
    calculate(PL);
    cout << PL.score << ":" << PL.bonus << endl;
    calculate(PL, 15);
    cout << PL.score << ":" << PL.bonus << endl;

    return 0;
}
```

Answer

3. Find the Answer of the following program. Assuming all the desired header files are already included, which are required to run the code.

```
struct MyBox
{
    int length, breadth, height;
};

void dimension (MyBox M)
{
    cout << M.length << "x" << M.breadth << "x";
    cout << M.height << endl;
}
```

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```
int main ()
{
    MyBox B1 = {10, 15, 5}, B2, B3;
    ++B1.height;
    dimension(B1);
    B3 = B1;
    ++B3.length;
    B3.breadth++;
    dimension(B3);
    B2 = B3;
    B2.height += 5;
    B2.length--;
    dimension(B2);

    return 0;
}
```

Answer

4. Rewrite the following program after removing the syntactical errors (if any). Underline each correction.

```
struct Pixels
{
    int color, style;
}

void showPoint(Pixels P)
{
    cout << P.color, P.style << endl;
}

int main()
{
    Pixels Point1 = (5, 3);
    showPoint(Point1);
    Pixels Point2 = Point1;
    color.Point1 += 2;
    showPoint(Point2);

    return 0;
}
```

Answer

5. Declare a structure to represent a complex number (a number having a real part and imaginary part). Write C++ functions to add, subtract, multiply and divide two complex numbers.

6. An array stores details of 25 students (rollNo, name, marks in three subject). Write a program to create such an array and print out a list of students who have failed in more than one subject.

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Class and Object

[Set – 1]

1. Define a class student with the following specification

Private members of class student

admno integer

sname 20 character

eng. math, science float

total float

ctotal() a function to calculate eng + math + science with float return type.

Public member function of class student

Takedata() Function to accept values for admno, sname, eng, science and invoke ctotal() to calculate total.

Showdata() Function to display all the data members on the screen. .

2. Define a class batsman with the following specifications:

Private members:

bcode 4 digits code number

bname 20 characters

innings, notout, runs integer type

batavg it is calculated according to the formula –
batavg = runs/(innings-notout)

calcavg() Function to compute batavg

Public members:

readdata() Function to accept value from bcode, name, innings, notout and invoke the function
calcavg()

displaydata() Function to display the data members on the screen. .

3. Define a class TEST in C++ with following description:

Private Members

TestCode of type integer

Description of type string

NoCandidate of type integer

CenterReqd (number of centers required) of type integer

A member function CALCNTR() to calculate and return the number of centers as
(NoCandidates/100+1)

Public Members

- A function SCHEDULE() to allow user to enter values for TestCode, Description, NoCandidate & call function
CALCNTR() to calculate the number of Centres

- A function DISPTST() to allow user to view the content of all the data members .

4. Define a class in C++ with following description:

Private Members

A data member Flight number of type integer

A data member Destination of type string

A data member Distance of type float

A data member Fuel of type float

A member function CALFUEL() to calculate the value of Fuel as per the following criteria

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Distance	Fuel
<=1000	500
more than 1000 and <=2000	1100
more than 2000	2200

Public Members

A function FEEDINFO() to allow user to enter values for Flight Number, Destination, Distance & call function CALFUEL() to calculate the quantity of Fuel

A function SHOWINFO() to allow user to view the content of all the data members .

5. Define a class BOOK with the following specifications :

Private members of the class BOOK are

BOOK NO integer type

BOOKTITLE 20 characters

PRICE float (price per copy)

TOTAL_COST() A function to calculate the total cost for N number of copies where N is passed to the function as argument.

Public members of the class BOOK are

INPUT() function to read BOOK_NO, BOOKTITLE, PRICE

PURCHASE() function to ask the user to input the number of copies to be purchased. It invokes TOTAL_COST() and prints the total cost to be paid by the user.

Note : You are also required to give detailed function definitions .

6. Define a class REPORT with the following specification:

Private members :

adno 4 digit admission number

name 20 characters

marks an array of 5 floating point values

average average marks obtained

GETAVG() a function to compute the average obtained in five subject

Public members:

READINFO() function to accept values for adno, name, marks. Invoke the function GETAVG()

DISPLAYINFO() function to display all data members of report on the screen.

You should give function definitions .

Class and Object

[Set – 2]

1. Write the definition for a class called **Rectangle** that has floating point data members length and width. The class has the following member functions:

void setlength(float) to set the length data member

void setwidth(float) to set the width data member

float perimeter() to calculate and return the perimeter of the rectangle

float area() to calculate and return the area of the rectangle

void show() to display the length and width of the rectangle

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int sameArea(Rectangle) that has one parameter of type Rectangle. sameArea returns 1 if the two Rectangles have the same area, and returns 0 if they don't.

1. Write the definitions for each of the above member functions.
2. Write main function to create two rectangle objects. Set the length and width of the first rectangle to 5 and 2.5. Set the length and width of the second rectangle to 5 and 18.9. Display each rectangle and its area and perimeter.
3. Check whether the two Rectangles have the same area and print a message indicating the result. Set the length and width of the first rectangle to 15 and 6.3. Display each Rectangle and its area and perimeter again. Again, check whether the two Rectangles have the same area and print a message indicating the result. .

2. Write the definition for a class called **complex** that has floating point data members for storing real and imaginary parts. The class has the following member functions:

void set(float, float) to set the specified value in object

void disp() to display complex number object

complex sum(complex) to sum two complex numbers & return complex number

1. Write the definitions for each of the above member functions.
2. Write main function to create three complex number objects. Set the value in two objects and call sum() to calculate sum and assign it in third object. Display all complex numbers. .

3. Write the definition for a class called **Distance** that has data member feet as integer and inches as float. The class has the following member functions:

void set(int, float) to give value to object

void disp() to display distance in feet and inches

Distance add(Distance) to sum two distances & return distance

1. Write the definitions for each of the above member functions.
2. Write main function to create three Distance objects. Set the value in two objects and call add() to calculate sum and assign it in third object. Display all distances. .

4. Write the definition for a class called **time** that has hours and minutes as integer. The class has the following member functions:

void settime(int, int) to set the specified value in object

void showtime() to display time object

time sum(time) to sum two time object & return time

1. Write the definitions for each of the above member functions.
2. Write main function to create three time objects. Set the value in two objects and call sum() to calculate sum and assign it in third object. Display all time objects. .

Constructor

[Set – 1]

1. Answer the questions (i) and (iii) after going through the following class:

```
class Seminar
{
    int time;
public:
    Seminar()           //Function 1
    {
```

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```
        time = 30;
        cout << "Seminar starts now" << endl;
    }

    void lecture()          //Function 2
    {
        cout << "Lectures in the seminar on" << endl;
    }

    Seminar(int duration)  //Function 3
    {
        time = duration;
        cout << "Seminar starts now" << endl;
    }

    ~Seminar()            //Function 4
    {
        cout << "Thanks" << endl;
    }
};
```

- i. Write statements in C++ that would execute Function 1 and Function 3 of class Seminar.
- ii. In Object Oriented Programming, what is Function 4 referred as and when does it get invoked/called?
- iii. In Object Oriented Programming, which concept is illustrated by Function 1 and Function 3 together?

Answer:-

2. Answer the questions (i) and (ii) after going through the following class:

```
class Test
{
    char paper[20];
    int marks;
public:
    Test ()    // Function 1
    {
        strcpy (paper, "Computer");
        marks = 0;
    }

    Test (char p[])    // Function 2
    {
        strcpy(paper, p);
        marks = 0;
    }

    Test (int m)    // Function 3
    {
        strcpy(paper,"Computer");
        marks = m;
    }

    Test (char p[], int m)    // Function 4
    {
```

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```
        strcpy (paper, p);  
        marks = m;  
    }  
};
```

i. Write statements in C++ that would execute Function 1, Function 2, Function 3 and Function 4 of class Test.

ii. Which feature of Object Oriented Programming is demonstrated using Function 1, Function 2, Function 3 and Function 4 together in the above class Test?

Answer:-

3. Consider the definition of the following class:

```
class Sample  
{  
private:  
    int x;  
    double y;  
public :  
    Sample(); //Constructor 1  
    Sample(int); //Constructor 2  
    Sample(int, int); //Constructor 3  
    Sample(int, double); //Constructor 4  
};
```

i. Write the definition of the constructor 1 so that the private member variables are initialized to 0.

ii. Write the definition of the constructor 2 so that the private member variable x is initialized according to the value of the parameter, and the private member variable y is initialized to 0.

iii. Write the definition of the constructors 3 and 4 so that the private member variables are initialized according to the values of the parameters. Answer:-

Constructor and Destructor

[Set – 2]

1. A common place to buy candy is from a machine. The machine sells candies, chips, gum, and cookies. You have been asked to write a program for this candy machine.

The program should do the following:

1. Show the customer the different products sold by the candy machine.
2. Let the customer make the selection.
3. Show the customer the cost of the item selected.
4. Accept money from the customer.
5. Release the item.

The machine has two main components: a built-in cash register and several dispensers to hold and release the products.

Define class cashRegister in C++ with the following descriptions :

Private Members:

cashOnHand of type integer

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Public Members:

A default constructor cashRegister() sets the cash in the register to 500.

A constructor cashRegister(int) sets the cash in the register to a specific amount.

A function getCurrentBalance() which returns value of cashOnHand

A function acceptAmount(int) to receive the amount deposited by the customer and update the amount in the register

Define class dispenserType in C++ with the following descriptions :

Private Members:

numberOfItems of type integer

cost of type integer

Public Members:

A default constructor dispenserType () sets the cost and number of items in the dispenser to 50 each.

A constructor dispenserType (int,int) sets the cost and number of items in the dispenser to the values specified by the user.

A function getNoOfItems() to return the value of numberOfItems.

A function getCost() to return the value of cost.

A function makeSale() to reduce the number of items by 1.

When the program executes, it must do the following:

1. Show the different products sold by the candy machine.
2. Show how to select a particular product.

Once the user has made the appropriate selection, the candy machine must act accordingly. If the user has opted to buy a product and that product is available, the candy machine should show the cost of the product and ask the user to deposit the money. If the amount deposited is at least the cost of the item, the candy machine should sell the item and display an appropriate message.

Divide this program into three functions: showSelection, sellProduct, and main.

The function sellProduct must have access to the dispenser holding the product (to decrement the number of items in the dispenser by 1 and to show the cost of the item) as well as the cash register (to update the cash). Therefore, this function has two parameters: one corresponding to the dispenser and the other corresponding to the cash register. .

Inheritance

[Set – 1]

Question 1. Consider the following declaration and answer the questions given below :

```
class PPP
{
    int H;
protected :
    int S;
public :
    void input (int);
    void out();
};

class QQQ : private PPP
{
    int T;
protected :
    int U;
public :
    void indata(int, int);
```

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```
    void outdata();
};

class RRR : public QQQ
{
    int M;
    public :
    void disp();
};
```

- i. Name the base class and derived class of the class **QQQ**.
- ii. Name the data member(s) that can be accessed from function **disp()**.
- iii. Name the member function(s), which can be accessed from the objects of class **RRR**.
- iv. Is the member function **out()** accessible by the object of the class **QQQ**?

Answer:-

Question 2. Answer the questions (i) to (iv) based on the following:

```
class Publisher
{
    char pub[12];
    double turnover;
protected:
    void register();
public:
    Publisher();
    void enter();
    void display();
};
```

```
class Branch
{
    char city[20];
protected:
    float employees;
public:
    Branch();
    void haveit();
    void giveit();
};
```

```
class Author : private Branch, public Publisher
{
    int acode;
    char aname[20];
    float amount;
public:
    Author();
    void start();
    void show();
};
```

- i. Write the names of data members, which are accessible from objects belonging to class **Author**.
- ii. Write the names of all the member functions which are accessible from objects belonging to class **Branch**.
- iii. Write the names of all the members which are accessible from member functions of class **Author**.
- iv. How many bytes will be required by an object belonging to class **Author**?

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Answer:-

Question 3. Consider the following declarations and answer the question given below :

```
class Vehicle
{
    private:
        int wheels;
    protected :
        int passenger;
    public :
        void inputdata(int, int);
        void Answerdata();
};

class Heavyvehicle : protected Vehicle
{
    int diesel_petrol;
    protected :
        int load;
    public:
        void readdata(int, int);
        void writedata();
};

class Bus : private Heavyvehicle
{
    char make[20];
    public :
        void fetchdata(char);
        void displaydata();
};
```

- (i) Name the base class and derived class of the class **Heavyvehicle**.
- (ii) Name the data member(s) that can be accessed from function **displaydata()**.
- (iii) Name the data member's that can be accessed by an object of **Bus** class.
- (iv) Is the member function **Answerdata()** accessible to the objects of **Heavyvehicle** class.

Question 4. Answer the questions (i) to (iv) based on the following code :

```
class Drug
{
    char category[10];
    char date_of_manufacture[10];
    char company[20];
    public:
        Drug();
        void enterdrugdetails();
        void showdrugdetails();
};

class Tablet : public Drug
{
    protected:
        char tablet_name[30];
        char volume_label[20];
```

```
public:
    float price;
    Tablet();
    void entertabletdetails();
    void showtabletdetails ();
};

class PainReliever : public Tablet
{
    int dosage_units;
    char side_effects[20];
    int use_within_days;
public:
    PainReliever();
    void enterdetails();
    void showdetails();
};
```

- (i) How many bytes will be required by an object of class **Drug** and an object of class **PainReliever** respectively ?
- (ii) Write names of all the data members which are accessible from the object of class **PainReliever**.
- (iii) Write names of all the members accessible from member functions of class **Tablet**.
- (iv) Write names of all the member functions which are accessible from objects of class **PainReliever**.

File Handling - Text File

[Set – 1]

1. Write a C++ program to write number 1 to 100 in a data file NOTES.TXT. .
2. Write a C++ program, which initializes a string variable to the content "Time is a great teacher but unfortunately it kills all its pupils. Berlioz" and Answers the string to the disk file OUT.TXT. you have to include all the header files if required. .
3. Write a user-defined function in C++ to read the content from a text file OUT.TXT, count and display the number of alphabets present in it. .
4. Write a function to count the number of blank present in a text file named "OUT.TXT". .
5. Write a function to count number of words in a text file named "OUT.TXT". .
6. Write a function in C++ to print the count of word the as an independent word in a text file STORY.TXT. for example, if the content of the file STORY.TXT is
There was a monkey in the zoo. The monkey was very naughty.

Then the ouput of the program should be 2. .

7. Write a function in C++ to count and display the number of lines not starting with alphabet 'A' present in a text file "STORY.TXT".

Example:

If the file "STORY.TXT" contains the following lines,

The rose is red.

A girl is playing there.

There is a playground.

An aeroplane is in the sky.

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Numbers are not allowed in the password.

The function should display the Answer as 3. .

8. Assuming that a text file named FIRST.TXT contains some text written into it, write a function named copyupper(), that reads the file FIRST.TXT and creates a new file named SECOND.TXT contains all words from the file FIRST.TXT in uppercase. .

9. Assuming that a text file named FIRST.TXT contains some text written into it, write a function named vowelwords(), that reads the file FIRST.TXT and creates a new file named SECOND.TXT, to contain only those words from the file FIRST.TXT which start with a lowercase vowel (i.e., with 'a', 'e', 'i', 'o', 'u').

For example, if the file FIRST.TXT contains
Carry umbrella and overcoat when it rains
Then the file SECOND.TXT shall contain
umbrella and overcoat it .

File Handling - Binary File

[Set – 2]

Question 1. Assuming the class EMPLOYEE given below, write functions in C++ to perform following:

(i) Write the objects of EMPLOYEE to a binary file.

(ii) Read the objects of EMPLOYEE from binary file and display them on screen.

class EMPLOYEE

```
{
    int ENO;
    char ENAME[10];
public :
    void GETIT()
    {
        cin >> ENO;
        gets (ENAME);
    }
    void SHOWIT()
    {
        cout <<ENO << ENAME <<endl;
    }
};
```

Question 2. Assuming the class Computer as follows :

class computer

```
{
    char chiptype[10];
    int speed;
public:
    void getdetails()
    {
        gets(chiptype);
        cin>>speed;
    }
    void showdetails()
```


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```
{
    cout << "Chip" << chitype << " Speed = " << speed;
}
};
```

Write a function **readfile()** to read all the records present in an already existing binary file SHIP.DAT and display them on the screen, also count the number of records present in the file.

Question 3. Given a binary file STUDENT.DAT, containing records of the following class Student type

```
class Student
{
    char S_Admno[10]; //Admission number of student
    char S_Name[30]; //Name of student
    int Percentage; //Marks Percentage of student
public:
    void EnterData()
    {
        gets(S_Admno);
        gets(S_Name);
        cin>>Percentage;
    }
    void DisplayData()
    {
        cout << setw(12) << S_Admno;
        cout << setw(32) << S_Name;
        cout<<setw(3) << Percentage << endl;
    }
    int ReturnPercentage()
    {return Percentage;}
};
```

Write a function in C++, that would read contents of file STUDENT.DAT and display the details of those Students whose Percentage is above 75.

Question 4. Observe the program segment given below carefully and fill the blanks marked as Statement 1 and Statement 2 using seekg() and tellg() functions for performing the required task.

```
#include <fstream.h>
class Employee
{
    int Eno;
    char Ename[20];
public:
    //Function to count the total number of records
    int Countrec();
};

int Item::Countrec()
{
    fstream File;
    File.open("EMP.DAT", ios::binary | ios::in);
    ___ ___ ___ //Statement 1
    int Bytes = ___ ___ ___ //Statement 2
```

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```
int Count = Bytes / sizeof(Item);
File.close();
return Count;
}
```

Question 5. Write a function in C++ to add new objects at the bottom of a binary file "STUDENT.DAT", assuming the binary file is containing the objects of the following class.

```
class STUD
{
    int Rno;
    char Name[20];
public:
    void Enter()
    {cin >> Rno; gets(Name); }
    void Display()
    {cout << Rno << Name << endl;}
};
```

Question 6. Observe the program segment given below carefully and fill the blanks marked as Statement 1 and Statement 2 using seekp() and seekg() functions for performing the required task.

```
#include <fstream.h>
class Item
{
    int Ino;
    char Item[20];
public:
    //Function to search and display the content from a particular record number
    void Search(int );
    //Function to modify the content of a particular record number
    void Modify(int);
};
```

```
void Item::Search(int RecNo)
{
    fstream File;
    File.open( "STOCK.DAT", ios::binary | ios::in);
    ___ ___ ___ //Statement 1
    File.read((char*)this, sizeof(Item));
    cout << Ino << "==" << Item << endl;
    File.close();
}
```

```
void Item::Modify(int RecNo)
{
    fstream File;
    File.open( "STOCK.DAT", ios::binary | ios::in | ios::out);
    cin >> Ino;
    cin.getline(Item, 20);
    ___ ___ ___ //Statement 2
    File.write( (char*)this, sizeof(Item));
}
```

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```
File.close();  
}
```

Data Structure - Link, Stack and Queue

[Set – 2]

Question 1. Complete the class with all function definitions for a stack

```
class stack  
{  
    int data[10];  
    int top;  
public :  
    stack(){top=-1;}  
    void push();  
    void pop();  
}
```

Question 2. Change the following infix expression postfix expression.

$(A + B) * C + D / E - F$

Question 3. Convert the expression $(True \ \&\& \ False) \ || \ !(False \ || \ True)$ to postfix expression. Show the contents of the stack at every step.

Question 4. Use a stack to evaluate the following postfix expression and show the content of the stack after execution of each operation. Don't write any code. Assume as if you are using push and pop member functions of the stack.

$AB-CD+E^*+$ (where $A=5, B=3, C=5, D=4,$ and $E=2$)

Question 5. Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation :

$50,40,+,18,14,-,*,+$

Question 6. Evaluate the following postfix expression using a stack and show the contents of stack after execution of each operation :

$TRUE, FALSE, TRUE, FALSE, NOT, OR, TRUE, OR, OR, AND$

Question 7. Complete the class with all function definitions for a circular queue

```
class queue  
{  
    int data[10];  
    int front, rear;  
public :  
    queue(){front=-1;rear=-1}  
    void add();  
    void remove();  
}
```

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Question 8. Each node of a STACK contains the following information, in addition to required pointer field :

i) Roll number of the student

ii) Age of the student

Give the structure of node for the linked stack in question TOP is a pointer which points to the topmost node of the STACK. Write the following functions.

i) PUSH() - To push a node to the stack which is allocated dynamically

ii) POP() - To remove a node from the stack and release the memory.

Question 9. Write a function in C++ to perform a DELETE operation in a dynamically allocated queue considering the following description :

```
struct Node
{
    float U,V;
    Node *Link;
};
class QUEUE
{
    Node *Rear,*Front;
public:
    QUEUE(){Rear=NULL; Front=NULL;}
    void INSERT();
    void DELETE();
    ~QUEUE();
};
```

Question 10. Give the necessary declaration of a linked list implemented queue containing float type values. Also write a user-defined function in C++ to delete a float type number from the queue.