Computer Science (083) Practical File for Class XII

Index for C++ Programming

Name: _____ Section: ___ Roll No.: ____

Last Date of Submission (Program No. 1 – 21) 31/05/2019
Last Date of Submission (Program No. 22 – 29) 31/07/2019
Last Date of Submission (Program No. 30 – 40) 31/08/2019

<table>
<tr><th>SN.</th><th>Program Description</th><th>Topic</th></tr>
<tr><td>1.</td><td>Write a program to play the following game:
The player guesses a number from 2 to 19 and then the program generates three random numbers from 101 to 199. If the sum of the digits of any of these numbers matches the player's number, then the player is declared a winner otherwise the player looses the game.</td><td>C++ Revision (Class XI)</td></tr>
<tr><td>2.</td><td>Write a function to generate the nth term in a Fibonacci sequence. Use this function to print first N terms of the sequence.</td><td>C++ Revision (Class XI)</td></tr>
<tr><td>3.</td><td>Write programs to input the values of x and n and sum up n terms of each of the following series:
$1 - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} \ldots$</td><td>C++ Revision (Class XI)</td></tr>
<tr><td>4.</td><td>WAP to generate n lines of the following patterns on the computer screen:
<table>
<tr><td>(i) If n is 4, the output is
<pre>
   1
  121
 12321
1234321
</pre></td><td>(ii) If n is 4, the output is
<pre>
****
 *****
  ***
   *
</pre></td></tr>
<tr><td>(iii) If n is 7, the output is
<pre>
   *
  * *
 *   *
*   *
 *   *
  * *
   *
</pre></td><td>(iv) If n is 9, the output is
<pre>
    *
* *
      *   *
     *   *
    ****
     ****
      *****
***
        *
</pre></td></tr>
</table></td><td>C++ Revision (Class XI)</td></tr>
<tr><td>5.</td><td>Write a program to read a string and print out the following :
1) No. of capital alphabets,
2) No. of small alphabets,
3) No. of non-alphabets,
4) No. of Words.
(Use suitable functions for each operation)</td><td>C++ Revision (Class XI)</td></tr>
<tr><td>6.</td><td>Write a program to read a string and print it after replacing each of its capital alphabets by the corresponding small alphabet and each small alphabet by its corresponding capital alphabet.</td><td>C++ Revision (Class XI)</td></tr>
</table>

7.	Write a program to input a string. If the string is a palindrome then concatenate "Hello Palindrome ", otherwise concatenate "Hello Non-palindrome " with the given string. Then display the resultant string.	C++ Revision (Class XI)
8.	Write a program in C++ which accepts an integer array and its size as arguments/parameters and exchanges the values of first half side elements with the second half side elements of the array. Example: If an array of eight elements has initial contents as 2,4,1,6,7,9,23,10 The function should rearrange the array as 7,9,23,10,2,4,1,6	C++ Revision (Class XI)
9.	Write a program to input n (<=20) integers in an array and then display the array after removing all the duplicate entries from it.	C++ Revision (Class XI)
10.	Write a program to input the elements in a matrix of size m x n and do the following operations on it: (i) find the row sums (ii) find the column sums (iii) find the diagonal sums (iv) find the transpose (v) display the upper half (vi) display the lower half	C++ Revision (Class XI)
11.	Write a program to input the morning, noon, and evening temperature for each of the seven days of a week and then display a report showing the following: 1. Maximum and minimum morning temperature 2. Maximum and minimum noon temperature 3. Maximum and minimum evening temperature 4. Average morning temperature 5. Average noon temperature 6. Average evening temperature 7. Average temperature of the week (Use a 2D array)	C++ Revision (Class XI)
12.	Write a menu driven program to use a macro, an inline function, and an outline function to find the square of an integer input from the use.	C++ Revision (Class XI)
13.	Write a program to sort a list of character, integers, floats, or strings depending upon the user's choice. Use function overloading to do this.	C++ Revision (Class XI)
14.	Write a program to input two numbers n and x and then calculate x^n using a function power() with suitable parameters and return data type. If the value of n is not passed to the function, it should calculate x^1.	C++ Revision (Class XI)
15.	Write a program to input two numbers and increment the smaller by 10%. (Use the concept of return by reference).	C++ Revision (Class XI)
16.	Write a program to input Name and Aggregate marks of each of the n (<=20) students of a class using structures. The program should then display this marks list in the ascending order of names or descending order of marks depending upon the user's choice. The lists should be displayed in the following format using the **gotoxy()** function: S.No. Name Marks ----- ---------- -----	Structures

17.	Write a program to input two distances in feet and inches and then display the sum of these distances. Use a function for this purpose. The function should take the two distances as parameters and return the resultant distance. The program should also use a function Adjust() that adjusts a given distance so that if the number of inches in a distance is more than or equal to 12, it should be properly adjusted into feet.	Structures
18.	Define a class STUDENT that has the following data members: **Name, Roll Number, Marks of 5 subjects** and member functions to input and display data. It also has a function member to assign stream on the basis of the table given below: **Average Marks** **Stream** 96% or more Computer Science 91% - 95% Electronics 86% - 90% Mechanical 81% - 85% Electrical 75% - 80% Chemical 71% - 75% Civil Write a program to define the class STUDENT and input the data (excluding Stream) of ***n*** (<=20) students and for each student allot the stream. Display a formatted report using the functions and declarations available in **iomanip.h.**	Classes and Objects
19.	Write a program to find out the sum, difference, and product of two rational numbers. Use a class with suitable data and function members to this job. The class should also have two constructors – one non-parameterised constructor which initializes a rational no. to 0/1 and the other a parameterized constructor to initialize a rational number.	Constructors and Destructors
20.	Write a program to define a class POINT with data members *x* and *y* and function members to input and display the co-ordinates of a point. Also write a function member to find the distance of a point from another point given as a parameter and a copy constructor. Then define a class Triangle which has three data member each of type POINT. Define function members to input the co-ordinates of three vertices, display the co-ordinates of the vertices, and calculate and return the area of a triangle.	Copy Constructor and Containership
21.	Write a program to define a class STUDENT as specified in program no. 18. From this class derive a class WORKING_STUDENT with extra data members JOB and OFFICE_ADDRESS. Write appropriate function members and complete the program to demonstrate the use of inheritance.	Inheritance
22.	Write a program to input the name of a text file from the user and display: a) The number of blanks present in the file. b) The number of lines present in the file. c) The number of capital alphabets present in the file. d) The number of small alphabets present in the file. e) The number of lines starting with a capital alphabet. f) The number of words present in the file. g) The number of digits present in the file.	Text File (Reading)

	h) The number of words ending with a vowel	
23.	Write a program to input the name of a text file from the user. Then input a string and search for it in the file and display the status whether it is present in the file or not. The program should also check the existence of the file in the beginning.	Text File (Reading)
24.	Write a program to input a text file name, read the contents of the file and create a new file named COPY.TXT, which shall contain only those words from the file (which has been specified by the user) that don't end with a vowel. For example, if the original file contains Physical, Mental, or Emotional harm to anyone is a crime. *–Anonymous* Then the text file COPY.TXT shall contain Physical, Mental, or Emotional harm is . – *Anonymous*	Text File (Reading and Writing)
25.	Write a program to perform SEARCH and REPLACE operation on a text file. For this, input the name of a text file from the user. Then input two characters and search for the first character in the file and replace it with the second character. Do it for all the occurances of the first character in the text file. (Use a temporary file for this purpose)	Text File (Modification)
26.	Declare a structure *telerec* in C++, containing name (20 characters) and telephone number. Write a program to maintain a binary file of telephone records. The program should allow the following functions on the file: 1) To append records in the file. 2) Display the name for a given telephone number. If the telephone number does not exist then display error message "record not found". 3) Display the telephone number(s) for a given name. If the name does not exist then display error message "record not found".	Binary File (Reading and Writing)
27.	A blood bank maintains a data file that contains the following information for every donor: Name, Date of Birth, Telephone number, Blood group. Write a program in C++ to do the following: 1) Given a blood group, display name, date of birth and phone number of all the persons of the given blood group. 2) Append records in the file. 3) Input a telephone number and modify the corresponding record.	Binary File (Reading and Writing)
28.	Create two payroll files COMP1.DAT and COMP2.DAT. Each of the files should have records with the following fields: EmpNo : Integer Name : A string of 20 characters Salary : A floating point number. Both the files should be created in the increasing order of the EmpNo. Your program should then merge the two files and obtain a third file NEWCOMP.DAT. The program should also display the data from all the three files. Do not use arrays for merging and sorting of the files.	Binary File (Reading and Writing)
29.	Write a menu driven program in C++ to perform the following functions on a binary file "BOOK.DAT" containing objects of the following class:	Binary File

	class Book
	{ int BookNo;
	char Book_name[20];
	public:
	// function to enter book details
	void enterdetails();
	//function to display Book details
	void showdetails();
	//function to return Book_no
	int Rbook_no() {return Book_no;}
	//function to return Book_name
	int Rbook_name() {return Book_name;}
	};
	1. Append Records
	2. Modify a record for a given book no.
	(Use seekg(), tellg() for this purpose)
	3. Delete a record with a given book no.
	4. Search for a record with a given Book name
	5. Display a sorted list of records (sort on Book No.)
	6. Display a sorted list of records (Sort on Book Name)
	Note: (i) Use dynamic array for sorting of the file.
	(ii) Use gotoxy() to display the formatted reports.
	(iii) The program should be password protected.
		(Reading, Writing, and Modification)

30.	Write a program to create a linked list in which each node contains the roll number and name of a student. Then perform search operations for name as well as roll no. on this list.	Data Structures (Self Referential Structures)
31.	Write a menu driven program which allows the user to perform the following operations on a one dimensional array: Insertion, deletion, sorting (selection, insertion), display.	Data Structures (Arrays)
32.	Write a menu driven program to search an integer in a list of integers using any of the following techniques. (i) Linear Search (ii) Binary Search Use bubble sort to sort the list, if required.	Data Structures (Arrays)
33.	Write a program to input integer data in two arrays. Sort one of the arrays in ascending order and the other in descending order. Then merge them into a third array so that the data in the third array is in ascending order. The program should then display the data from all the three arrays.	Data Structures (Arrays)
34.	Write a function in C++ which accepts an integer array and its size as arguments/parameters and assigns the elements into a two-dimensional array of integers in the following format: If the array is 1, 2, 3, 4, 5, 6 If the array is 1, 2, 3 The resultant 2-D array is: The resultant 2-D array is: 1 2 3 4 5 6 1 2 3 1 2 3 4 5 0 1 2 0 1 2 3 4 0 0 1 0 0 1 2 3 0 0 0 1 2 0 0 0 0	Data Structures (Arrays)

	1 0 0 0 0 0 .	
35.	Suppose a company keeps a single dimensional array YEAR[100] such that YEAR[K} contains the number of employees appointed in year K. Write a C++ which stores random number of employees (0 – 50) in the array and then performs the following tasks: a) To find each of the years in which no employee was appointed. b) To find the number of years in which no employee was appointed. c) To find the number of employees who were appointed 5 years ago or before.	Data Structures (Array)
36.	Write a menu driven program which allows the user to perform the following operations on a stack (Array implementation): 1) Push 2) Pop 3) Display	Data Structures (Array Stack)
37.	Write a menu driven program which allows the user to perform the following operations on a queue (Array implementation): 1) Insert 2) Delete 3) Display	Data Structures (Array Queue)
38.	Write a menu driven program which allows the user to perform the following operations on a stack (Linked implementation): 1) Push 2) Pop 3) Display	Data Structures (Linked Stack)
39.	Write a menu driven program which allows the user to perform the following functions on a queue (Linked implementation): 1) Insert 2) Delete 3) Display	Data Structures (Linked Queue)
40.	Write a program using a stack to input a number and display it as a product of its prime factors in the descending order. E.g., if the number input is 252, then the output should be 7 x 3 x 3 x 2 x 2. (The smallest factor of any number is guaranteed to be a prime)	Data Structures (Stack)

Index for SQL

Name: Section: Roll No.:

Consider the tables given below and answer the questions that follow:

Table: **Employee**

No	Name	Salary	Zone	Age	Grade	Dept
1	Mukul	30000	West	28	A	10
2	Kritika	35000	Centre	30	A	10
3	Naveen	32000	West	40		20
4	Uday	38000	North	38	C	30
5	Nupur	32000	East	26		20
6	Moksh	37000	South	28	B	10
7	Shelly	36000	North	26	A	30

Write SQL commands to:

Create Table / Insert Into

1. Create the above tables and insert tuples in them.

Simple Select

2. Display the details of all the employees.
3. Display the Salary, Zone, and Grade of all the employees.
4. Display the records of all the employees along with their annual salaries. The Salary column of the table contains monthly salaries of the employees.
5. Display the records of all the employees along with their annual salaries. The Salary column of the table contains monthly salaries of the employees. The new column should be given the name "Annual Salary".

Conditional Select using Where Clause

6. Display the details of all the employees who are below 30 years of age.
7. Display the names of all the employees working in North zone.
8. Display the salaries of all the employees of department 10.

Using NULL

9. Display the details of all the employees whose Grade is NULL.
10. Display the details of all the employees whose Grade is not NULL.

Using DISTINCT Clause

11. Display the names of various zones from the table Employee. A zone name should appear only once.
12. Display the various department numbers from the table Employee. A department number should be displayed only once.

Using Logical Operators (NOT, AND, OR)

13. Display the details of all the employees of department 10 who are above 30 years of age.
14. Display the details of all the employees who are getting a salary of more than 35000 in the department 30.
15. Display the names and salaries of all the employees who are working neither in West zone nor in Centre zone.
16. Display the names of all the employees who are working in department 20 or 30.
17. Display the details of all the employees whose salary is between 32000 and 38000.
18. Display the details of all the employees whose grade is between 'A' and 'C'.

Using IN Operator

19. Display the names of all the employees who are working in department 20 or 30. (Using IN operator)

20. Display the names and salaries of all the employees who are working neither in West zone nor in Centre zone. (Using IN operator)

Using BETWEEN Operator

21. Display the details of all the employees whose salary is between 32000 and 38000. (Using BETWEEN operator)
22. Display the details of all the employees whose grade is between 'A' and 'C'. (Using BETWEEN operator)

Using LIKE Operator

23. Display the name, salary, and age of all the employees whose names start with 'M'.
24. Display the name, salary, and age of all the employees whose names end with 'a'.
25. Display the name, salary, and age of all the employees whose names contain 'a'
26. Display the name, salary, and age of all the employees whose names do not contain 'a'
27. Display the details of all the employees whose names contain 'a' as the second character.

Using Aggregate functions

28. Display the sum and average of the salaries of all the employees.
29. Display the highest and the lowest salaries being paid in department 10.
30. Display the number of employees working in department 10.

Using ORDER BY clause

31. Display the details of all the employees in the ascending order of their salaries.
32. Display the details of all the employees in the descending order of their names.
33. Display the details of all the employees in the ascending order of their grades and within grades in the descending order of their salaries.

Using GROUP BY clause

34. Display the total number of employees in each department.
35. Display the highest salary, lowest salary, and average salary of each zone.
36. Display the average age of employees in each department only for those departments in which average age is more than 30.

Using UPDATE, DELETE, ALTER TABLE

37. Put the grade B for all those whose grade is NULL.
38. Increase the salary of all the employees above 30 years of age by 10%.
39. Delete the records of all the employees whose grade is C and salary is below 30000.
40. Delete the records of all the employees of department 10 who are above 40 years of age.
41. Add another column HireDate of type Date in the Employee table.

Creating and Using VIEWs

42. Create a view West_Zone which displays the records of employees working in West zone only.
43. Create a view Above_30 which displays the records of only those employees who are above 30 years of age.
44. Display the data from the view West_Zone.
45. Display the records of the employees from the view Above_30 who work in the Sales department.
46. Using the view West_Zone increase the salary of all the employees by 12%.

JOIN of two tables

47. Display the details of all the employees who work in Sales department.
48. Display the Name and Department Name of all the employees.

DROP TABLE, DROP VIEW

49. Drop the views created above.
50. Drop the tables Employee and Department.