

**INDIAN SCHOOL MUSCAT  
COMPUTER SCIENCE(083)  
CLASS XI 2017-2018**

**Worksheet No. 1**

**Topic : Getting Started With C++**

1. Write a program to generate the following output:

Year	Profit%
2011	18
2012	27
2013	32
2. Write a program to input breadth(b) and height (h) and the area of a triangle using the formula  $\frac{1}{2}bh$ .
3. Write a program to input X and n and find  $X^n$  and  $\sqrt{X}$  using built-in functions.
4. Write a program to convert temperature in degree Celsius to Fahrenheit using the formula  $F=C*9/5+32$ .

**WORKSHEET – 2**

**TOPIC: Getting started with C++**

1. Write a program to accept a character and find its ASCII code and display it.
2. Write a program to accept the total number of days, find the number of years, remaining number of weeks and remaining number of days and display it.
3. An electricity board charges according to the following rates :  
For the first 100 units – 40 p per unit (p- paise)  
For the next 200 units – 50 p per unit  
Beyond 300 units – 60 p per unit  
All users are charged meter charge also which is Rs.50  
Write a Program to read a customer's number and the number of units consumed (more than 300) and print out the charges along with the customer number.

**WORKSHEET – 3**

**Topic : Operators and Expressions**

1. Write a C++ Program to input an integer and print whether it is positive or negative.
2. Write a C++ Program to input three integers and print the largest of three.
3. Write a C++ Program that inputs experience as number of years and age of a person and assigns his salary based on the following criteria.  
If the person is experienced (>0)
  - The salary of the person is 6000 if his age is more than 35,
  - If his age is more than 28 but less than 35 then the salary should be 4800
  - Otherwise the salary should be 3000.For inexperienced person the salary should be 2000.
4. Write a C++ Program that reads an alphabetic character c from the keyboard and then displays one of the following messages :

- If c is a lowercase letter, the message is “The uppercase character corresponding to it is ....”
- If c is an uppercase letter, the message is “The lowercase character corresponding to it is ...”

**Note:** The ASCII value for uppercase characters is 65 – 90 and lowercase characters is 97 – 122.

### **WORKSHEET – 4**

#### **Topic: if...else statements**

1. Write a program to print the smallest of 3 given integers.
2. Write a program to accept the monthly salary from the user. Compute and display income tax with the help of the following rules.

<b>Monthly Salary</b>	<b>Income tax</b>
9000 or more	40% of monthly salary
7500 -8999	30% of monthly salary
7499 or less	20% of monthly salary

3. Write a Program to input the code of a particular item, the quantity purchased and the rate. Calculate the total purchase and print it along with the gifts to be presented. The gifts to the customers are given in the following manner :

<b>Amount of Purchase (Rs.)</b>	<b>Gift</b>
100 and above but less than 500	A pen drive
500 and above but less than 1000	A leather purse
1000 and above	Scientific calculator

4. Write a Program which reads employee code(long int), department code(long int), salary(float) and experience(in years - int type) of an employee and categorise as Grade ‘A’, ‘B’ or ‘C’ based on the following conditions:
  - \* employees who have 20 or more than 20 years of experience and salary above 10000 belong to grade ‘A’
  - \* employees who have more than 10 years of experience but less than 20 years of experience and salary above 5000 belong to grade ‘B’
  - \* all employees of department code 12121 belong to grade ‘B’
  - \* all others belong to grade ‘C’

### **WORKSHEET – 5**

#### **Topic: switch...case statement**

1. Write a program to accept an integer( 1-7) and print the day corresponding to it. (1- Sunday, 2- Monday, ..... ,7- Saturday).

- Write a menu driven program to input a choice from user. If choice is 'S', program should find the volume of a sphere. If choice is 'C' it should find volume of a cylinder. Otherwise error message.
- Write a menu driven program to accept a choice from the user(1-4). If the choice is 1, input a character and check whether it is uppercase, lowercase or other character. If the choice is 2, input a number and check whether it is even or odd. If the choice is 3, input a character(A or S or W or R)and print the corresponding season(A-Autumn,S-Summer,W-Winter,R-Rainy) using switch ...case.If the choice is 4, it should exit from the program.

**WORKSHEET – 6**  
**Topic: Loop Structures**

- Write a program to print all the odd numbers from 100 to 5 using for loop.
- Write a Program to input a number and check whether it is palindrome or not using for loop.
- Write a program to print the multiplication table of a given number. For eg if number inputted is 5 the table should be printed in the format using while loop.  
 $1 * 5 = 5$   
 $2 * 5 = 10 \dots$  Upto  $10 * 5 = 50$
- Write a program to accept a number and check whether it is a perfect number or not and display the result using while loop.
- Write a program to find and print the sum of first n natural numbers using do..while loop.
- Write to print first 50 fibonacci numbers using do .. while loop .

**WORKSHEET – 7**  
**TOPIC: Loop Structures**

- Write a Program to input a number and print all prime numbers below the number using nested while loop.
- Write a C++ Program to read the value of x and the number of terms n from the user and compute the sum of the following series

$$\frac{x^2}{2!} - \frac{x^4}{4!} + \frac{x^6}{6!} - \frac{x^8}{8!} + \dots \pm \frac{x^{2n}}{(2n)!}$$

- Write a program to print the following pattern:

```
A
A B
A B C
A B C D
A B C D E
```

- Write a program to print the following pattern:

```
1
1 3
1 3 5
1 3 5 7
```

## WORKSHEET – 8

### Topic: Single dimensional arrays

1. Write a Program to read the noon day temperature for each day of a month (30 days) and display the month's average temperature, the hottest and coolest temperature of the month.
2. Write a program to input a list of 10 integers and sort them in ascending order using bubble sort method. Display the sorted array.
3. Write a program to input two arrays of 5 real numbers. Store these elements in a third array (merge) consisting of the numbers from the first array and second array in the same order. Display the third array.
4. Write a program to input an array of 5 integers, display the array. Input a number to be searched in the array. Display the position of the element in the array, if found, or an error message, otherwise. Use Linear Search method.

## WORKSHEET – 9

### Topic: Single dimensional arrays

1. Write a program to accept a sentence and count the number of words, number of vowels, number of consonants in it and display with appropriate message.
2. Write a program to accept a string and check whether it is palindrome or not.
3. Write a program to input a string. Accept a position in the string and display the string up to that position.

## WORKSHEET – 10

### Topic: Two dimensional arrays

1. Write a menu driven program to perform the operations as per the following menu.  
MENU
  1. Read a m x n matrix.
  2. Transpose
  3. Display the diagonal elements and their sum
  4. Display the border elements and their sum
  5. Display the upper triangular matrix
  6. Display the lower triangular matrix
  7. Display the row total
  8. Display the column total
  9. Display the matrix
  10. Exit
2. Write a program to accept two 3 X 3 matrices, add them and store it in another matrix and display the resultant matrix.
3. Write a program to input 2 matrices of the order M X N and P X Q. Check if it is possible to multiply these matrices. If possible, multiply them and store it in another matrix and display the resultant matrix.

## WORKSHEET – 11

### Topic: Two dimensional character arrays

1. Write a program to input 5 strings and change each string to toggle case(change uppercase character to lowercase and viceversa) and display the strings.
2. Write a program to input 5 strings and sort the strings in the ascending order.
3. Write a program to input 5 strings in uppercase. Convert them in lowercase & find the number of vowels ,digits and other characters in each string.
4. Write a program input 5 strings and display each string in the reverse order.

## WORKSHEET – 12 Topic: Structures

1. Define a structure student with the following members :rollno, name and marks in 5 subjects, total and average. Write a C++ Program to read roll number, name and marks of a student using the above structure and compute total and average and display all the details.
2. Define a structure customer with the following members : Idno, name and units and amount. Write a C++ Program to read Idno, name and number of units consumed for n customers and compute amount as per the following criteria :

Units	Amount
1 - 100	200 baiza per unit
101 – 300	400 baiza per unit
> 300	500 baiza per unit

For example , if the units consumed is 350, then  
amount = 100\*0.200 + 200\*0.400 + 50\*0.500

Display Idno, name, number of units and total amount for n customers.

3. Write a program to do the following : Define a structure TIME with three integer elements : Hr, Mn, Ss. Declare a variable T1 of type TIME and simultaneously initialize it with 0,0,0. Declare another variable T2 of type TIME and copy the values of T1 in T2. Display the values in T1 and T2. Obtain new values of T1 and T2 from the user. Display the values in T1 and T2. Add T1 and T2 and store the sum in third variable T3 (Keeping in mind that seconds and minutes can't be greater or equal to 60). Display the values in T3.

## WORKSHEET – 13 Topic: FUNCTIONS

1. Write a program using function to print the sum of the following series. Give the function name as “**series**”.Accept the value of “x” and the number of terms “n” within the function. Display the result from the main( ) function.

$$x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$$

2. Write a program using function to check whether a number is prime or not. Give the function name as “**prime**”. Accept the number in the main( ) function, Pass this number to the function and display the result from the function.
3. Write a program to show the working of **call by reference** method of function invoking. Accept two integers in the main( ) function and display it, pass this numbers to the function named **swap( )** which does not return any value,

interchange these numbers within the function **swap()** and display there itself. Now again display the values of the original variables from the **main()** function.

4. Write a program using functions to accept an array of 10 integers. Accept the integers in the **main()** function. Pass the numbers to a function named **sort()** which does not return any value, and sort the numbers in descending order within the function **sort()**. Display the sorted numbers from the **main()** function.

5. Write a program to accept a string and a character in the **main()** function. Pass this string and the character to a function named **check()**, check how many times the character is present in the string and display the result within the function **check()**.

6. Write a program using function to find the compound interest. Give the function name as **interest**. Accept principal amount and number of years in the **main()** function, fix the rate 10% as **default argument**. Pass principal amount and number of years to the function **interest**, calculate the compound interest and display the result within the function.

7. Write a function in C++ that checks for matching braces in a parenthesized algebraic expression. Function returns a value 1 if the match is successful and zero otherwise. The program reads an expression, passes it to function and displays the result.