Set-1

1. Mr. S. Ghosh is an employee of a Private Firm. His Basic is Rs. 8825/-. Now DA is 74% of his basic salary and HRA is 15% of basic salary. Write a program to calculate his gross salary. [Though his basic salary is 8825/- Do this program where basic is taken through keyboard.]

2. The length and breadth of a rectangle and radius of a circle are input through keyboard. Write a program to calculate the area and perimeter of the rectangle, and the area and the circumference of the circle.

3. **Temperatures of a city in Fahrenheit degree are input through a keyboard. Write a program to convert the temperature into centigrade degrees.**

4. **Two numbers are input through a keyboard into two variables. Write a program to interchange (i.e. swap) the contents of the two variables**

   i. **using a third variable.**
   ii. **without using a third variable**
   iii. without using a third variable and without using any arithmetic operator

5. Write a Program to find area of a triangle, where Area of triangle = sqrt[s(s-a)(s-b)(s-c)], where a, b and c are three sides of the triangle and s=a+b+c/2.

6. Write a program to convert a given number of days into months and days. Assume any month consists of 30 days. [For example, if number of days is input as 68, then output will be 2 months 8 days.]

7. Write a program which will take a 2-digit number from keyboard as input and print it in reverse order. [For example, if 59 is input, then output will be 95.]

8. Write a program which will take a 2-digit number from keyboard as input and check whether it is palindrome or not. [For example, 88 is a palindrome number but 78 is not.]

9. **Write a program to find the absolute value of a number using conditional operator.**

10. **Write a program to find the largest of three numbers using conditional operator.**

Set-2

1. Check whether a number is odd and even.

2. Check whether a number is positive or negative or zero.

3. **Check whether a year is leap or not.**

4. Determine whether an inputted character is a capital letter, a small case letter, a digit or a special symbol.

5. **Find the maximum / minimum of three inputted numbers.**

6. **Write a C Program to find the roots of a quadratic equation**
   $ax^2 + bx + c = 0$
   for all possible combination of a, b and c.
   [A quadratic equation will have two roots which are obtained using the following expression:
   $x = -b \pm (\text{sqrt of } (b^2-4ac))/2a$
   Note: when $b^2-4ac > 0$ the roots are real and unequal
   $b^2-4ac = 0$ the roots are real and equal i.e. $x = -b/2a$
   $b^2-4ac < 0$ the roots are imaginary]

7. **Print Grade of a student whose marks is inputted through keyboard according to following rules:**

Marks	Grade
90 to 100	**O**
80 to 89	**E**
70 to 79	**A**
60 to 69	**B**
50 to 59	**C**
40 to 49	**D**
0 to 39	**F**

   i. **using if-else statement**
   ii. using switch-case statement

8. Write a C Program to find the value of y using

$$y(x, n) = \begin{cases} 3 - 2x & \text{when } n = 0 \\ 2 + x/n & \text{when } n = 1 \\ 1 + x^2 & \text{when } n = 2 \\ 1 - nx & \text{when } n > 2 \text{ or } n < 0 \end{cases}$$

   i. using if-else statement
   ii. using switch-case statement

9. Write a C Program which will accept two integers A and B from keyboard and will perform either of the following operations according to the corresponding key pressed:

Key Pressed	Result
+	A + B
−	A − B
*	A * B
/	A / B
%	A % B

i. using if-else statement
ii. using switch-case statement

10. Write a C Program for the following…….
An electric bill distribution company arranges its domestic consumers as Follows:

Consumption in units	Rate of charge
0 − 200	Rs. 0.40 per unit
201 − 300	Rs. 50 plus Rs. 0.60 per unit excess to 200
301 − 400	Rs. 100 plus Rs. 0.80 per unit excess to 300
401 − 500	Rs. 150 plus Rs. 1.05 per unit excess to 400
Above 500	Rs. 250 plus Rs. 1.20 per unit excess to 500

Print the amount to be paid by the consumer.

11. Check whether a given alphabet is vowel or not.

12. Identify the type of a triangle.

Set-3

1. **Calculate X^Y without using pow() function**
2. **Calculate the Factorial value of a number**

3. **Generate the following Fibonacci series:**
0 1 1 2 3 5 8 13 · · · upto n terms
4. Generate the following series:
0 1 2 3 6 11 20 · · · upto n terms
5. Generate the following series:
1 2 4 7 11 · · · upto n terms
6. Generate the following series:
1 −3 6 −10 15 · · · upto 10 terms

5. Calculate the following:
   1+3+5+7+ · · · upto n terms
6. **Calculate the following:**
   1 + 1/2+ 1/3 + 1/4 + · · · upto n terms
7. Calculate the following:
   1+2+4+7+11 · · · upto n terms
8. Calculate the following:
   1 + 1/⌊2 + 1/⌊3 + 1/⌊4 + · · · upto n terms
9. **Calculate the following:**
   − 1 + 1/⌊3 − 1/⌊5 + 1/⌊7 − · · · upto n terms

10. Print all even numbers between 1 and 100.
11. Print all numbers between 1 and 100 omitting the numbers which are divisible by 7 as well as omitting the numbers which are divisible by 11.
12. Find the sum of all numbers between 1 and 100 which are divisible by both 2 as well as 3.

13. **Determine whether a given number is Prime or not.**
14. **Print all prime numbers between 1 and n.**
15. Print the very next prime number of a given number.
16. Print all prime factors of a number.
17. **Determine whether a 3-digit number is Armstrong or not. [**A 3-digit number is said to be Armstrong if summation of the cubes of its individual digits is the number itself, e.g., $153 = 1^3+5^3+3^3$]
18. Determine whether an N-digit number is Armstrong or not.
19. Print all Armstrong numbers between 0 and 10000.
20. Determine whether a number is Perfect or not. [A number is said to be perfect if summation of its factors(except the number itself) is the number itself, e.g., 6 = 1+2+3]
21. Determine whether a number is Strong or not. [A number is said to be strong if summation of the factorials of its individual digits is the number itself, e.g., 145 = ⌊1+⌊4+⌊5]
22. Check whether a number is power of 2 or not.

23. Calculate the number of digits of a given number.
24. **Calculate the sum of digits of an N-digit number.**
25. Calculate the sum of first and last digit of an N-digit number.
26. **Reverse an N-digit number.**
27. Determine whether an N-digit number is Palindrome or not. [A number is said to be palindrome if number is same from either direction, i.e., the number is equal to its reverse number. e.g., 373]

28. **Find HCF of two numbers (by at least two methods). From this, find the LCM of those two numbers.**

29. Print all ASCII values.

30. Fill the entire output black screen by the letter A (row_{max} = 24, $colomn_{max}$ = 80).

31. Print binary equivalent of a positive integer.
32. Print decimal equivalent of a positive binary number.

33. Generate the following Pyramid Patterns:

A.

i.
```
*
**
***
```

ii.
```
1
22
333
```

iii.
```
1
12
123
```

iv.
```
1
23
345
```

v.
```
1
01
101
```

vii.
```
1
23
456
```

viii.
```
1
01
010
```

B.

i.
```
***
**
*
```

C.

i.
```
***
 **
  *
```

D.

i.
```
  *
 **
***
```

ii.
```
  *
 * *
* * *
```

iii.
```
1
23
345
```

E.

i.
```
  *
 ***
*****
```

ii.
```
  1
 232
34543
```

F.

i.
```
*****
 ***
  *
```

ii.
```
  *
```

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

iii.
```
**   * *
*     *

*     *
* *  * *
```

G.

i.
```
*       *
* *   * *
* * * * *
```

ii.
```
* * * * *
* *   * *
*       *
```

H.
```
ABCDEDCBA
ABCD  DCBA
ABC    CBA
AB      BA
A        A
```

Set-4

DO EACH OF THE FOLLOWING PROGRAMS

(a) WITHOUT USING POINTER and (b) USING POINTER

1. Create an array of size 10 such that 0-th element of that array contains the value 1, 1st element contains the value 2, 2nd element contains the value 3 and so on. Display the array. Do not initialize the array and do not use any scanf function.
2. Create an array of size 10 such that 0-th element of that array contains the square value of 0, 1st element contains square value of 1, 2nd element contains square value of 2 and so on. Display the array. Do not initialize the array and do not use any scanf function.
3. Five numbers are entered through the keyboard into an array. Print the square values of them.
4. **Find the largest number of an array of 5 numbers.**
5. Find the largest and smallest number of an array of 5 numbers.

6. **Find the total number of even numbers and total numbers of odd numbers in an array of 10 numbers.**
7. **Find the sum of the numbers of an array of 10 numbers.**
8. **Search whether an element is present or not within an integer array of size 10. Print the position of the key value if it is a successful search.**
9. **Sort a series of numbers in either ascending or descending order.**
10. Swap the odd and even components of an array of size 10 .
11. Reverse the elements of an array without using another array.
12. Insert an element to an existing array.
13. Delete an element from an array
14. Remove the redundant (duplicate) elements of an array.
15. Convert a decimal integer into its equivalent binary form using array.

16. Print the Pascal's triangle.
17. Print the largest number from any M × N matrix.
18. Find the Determinant of a 3 × 3 matrix.
19. Find the Trace of a matrix.
20. **Find the Transpose of an M × N matrix.**
21. Determine whether a matrix is symmetric or not.
22. *Sort all the elements of an M × N matrix*.
23. Add two M × N matrices.
24. Multiply two matrices.
25. **Create the following 2−D Array without initializing and scanning from keyboard and then print the following pattern through printing the array elements.**

1 0 0 0 0
0 1 0 0 0
0 0 1 0 0
0 0 0 1 0
0 0 0 0 1

Set-5

DO EACH OF THE FOLLOWING PROGRAMS (a) WITHOUT USING POINTER AND (b) USING POINTER

1. **Find the length of an inputted string without using strlen( ) function.**
2. **Copy one inputted string to another string without using strcpy( ) function.**
3. **Check whether two inputted strings are equal or not without using strcmp( ) function.**
4. **Concatenate two inputted string without using strcat( ) function.**
5. Rewrite an inputted word in alphabetical order (e.g., COMPUTER−CEMOPRTU)
6. **Determine whether an inputted string is Palindrome or not.**
7. Print all rotations of an inputted word.
8. Replace two or more consecutive blanks in an inputted string by single blank.
9. Exchange two names using 2-D array of characters.
10. Sort a list of names inputted from keyboard in alphabetical order.
11.
    i. **Read a string from keyboard and Reverse it.**

ii. Reverse a number of strings

12.
   i. Count the number of words within an inputted string.
   ii. Count the number of lines, words and characters within an inputted text.

13.
   i. Read a line and count all the occurrences of a particular/each letter.
   ii. Read a line and count all the occurrences of a particular word.
   iii. Count all the occurrences of a particular letter in a 2-Dimensional array of characters.
   iv. Count all the occurrences of a particular word in a 2-Dimensional array of characters.
   v. Count all the occurrences of a particular line in a 2-Dimensional array of characters.

14.
   i. Read a line and replace all the occurrences of a particular letter by another letter.
   ii. Read a line and replace all the occurrences of a particular word by another word.
   iii. Replace all the occurrences of a particular letter in a 2-Dimensional array of characters by another letter.
   iv. Replace all the occurrences of a particular word in a 2-Dimensional array of characters by another word.
   v. Replace all the occurrences of a particular line in a 2-Dimensional array of characters by another line.

15. Count the number of vowels and consonants within an inputted string.

16. Covert a lower case line to upper case line.
17. Write a program in C to print the abbreviation of any name given as input. e.g "A. J.C.Bose" from the given input "Acharya Jagadish Chandra Bose".
18. Read a text and count all the occurrences of a particular/each letter.

Set-6

DO EACH OF THE FOLLOWING PROGRAMS (a) WITHOUT USING POINTER AND (b) USING POINTER

1. Build a function which receives a float and an int from main(), finds the product of these two and returns product which is printed through main().

2. Swap the values of two variables using function. (Assume that the two variables are defined as global variables).

3. Write a C function to find the square of a number and use this function in the main to evaluate $x^2 + y^2 + z^2$ where x, y and z are input through keyboard.

4. **Calculate Factorial of a given number using function**
   i. without recursion
   ii. with recursion

5. Find all prime factors of a given number using function

i. without recursion
ii. with recursion

6. Calculate the sum of a 5-digit number entered through keyboard using function
   i. without recursion
   ii. with recursion

7. Generate Fibonacci series using function
   i. without recursion
   ii. with recursion

8. Use a recursive function to evaluate
   $F(x) = x - x^3/\lfloor 3 + x^5/\lfloor 5 - x^7/\lfloor 7 + \cdots$ upto n terms

9. Use a recursive function to calculate HCF of two numbers. Using this calculate HCF of three numbers.

10. Use a recursive function to find maximum of three two numbers.
11. *Use a recursive function to solve Tower of Hanoi Problem*.
12. **Write a program in C to find the real roots of a quadratic equation using user defined function Quad( )**

Set-7

DO EACH OF THE FOLLOWING PROGRAMS USING POINTER

19. Swap two inputted number by using the concept of Call by Reference.
20. Calculate area and perimeter of a circle whose radius is inputted through keyboard by using the concept of call by reference.

21. Write the definition of the strlen( ) function.
22. Write the definition of the strcpy( ) function.
23. Write the definition of the strcmp( ) function.
24. Write the definition of the strcat( ) function.

25. Write the definition of the strupr( ) function.
26. Write the definition of the strlwr( ) function.
27. Write the definition of the strleft( ) function.
28. Write the definition of the strright( ) function.
29. Write the definition of the substr( ) function.

Set-8

1. Find the bigger of two entered number using a macro.

2. **A program which uses a file called "areaperi.h" (where definitions with arguments for area and perimeter of a triangle, a square and a circle are present) for calculating area and perimeter for different squares, triangles and circles.**

Typical question

1. #define SQUARE(X) (X*X)

```
main()
{
        printf("%d",SQUARE(2 + 3));
}
```

TYPICAL QUESTION:

1.

```
#include<stdio.h>

void f( void);

main()
{
        f( );
        f( );
}

void f(void)
{
        static int a;
        printf("%d",a);
        a = a + 1;
}
```

Set-9

1. **Define a structure called cricket which contains player name, team name and bating average. Input name, team name and bating average for 50 players and print the details of the player having highest bating average.**

2. **Declare a structure of a student with details like roll no, student name and total marks. Assume that there are not more than 150 students in college. Write a C program to read details of n students and print the list of students who have scored 75 marks and above.**

Set-10

1. Write a C Program to create a text file.

2. Write a C Program to read the text file and also count the number of characters present in the file.

3. Write a C Program to read the text file and also count the number of vowels present in the file.

4. Write a C program to display the frequency of each alphabetic character in a given file.

5. Write a C Program to copy the content of the file to another file.

6. **Write a C program to read a file and display its contents along with line numbers before each line.**

7.

Set-11

1. Write a program in C that will receive two filenames as **command line arguments** and will copy the contents of the first one to second one.

2. Write a C Program that will receive a file name and a line of text as **command line argument** and write the text to the file.

3. Write a C Program to find largest number among three numbers inputted by **command line argument**.