

CSE 1002 Problem Solving Using Computers

B.Tech (First Year), Semester II,
Session Jan 2025 – May 2025

Assignment-I

(Answer Any 10 Questions)

Date of Floating: 01-03-2025

Date of Submission: 07-03-2025

Note: Kindly submit it in handwritten only. If an assignment is found to be copied, then zero marks will be awarded.

1. Draw a block diagram of Von Neuman architecture of a computer, with its major components showing the transfer of data amongst its units. Also discuss the various registers used in Von Neuman stored program architecture.
2. Write a program in C to test whether a 4-digit number is Armstrong number or not.

[A number is said to be Armstrong if sum of its digits raised to the power of length of the number is equal to the number]

Example: $371 = 3^3 + 7^3 + 1^3$

$1634 = 1^4 + 6^4 + 3^4 + 4^4$

$54748 = 5^5 + 4^5 + 7^5 + 4^5 + 8^5$

Thus 371, 1634 and 54748 are all examples of Armstrong numbers.]

3. Write a program in C to enter a number and find the sum of the digits of the number.

For example:

Sample Input: 478

Sample Output: $4+7+8=19$.

4. Find the output of the following program.

```
#include<stdio.h>
#define SQR(x) (x*x)
int main()
{
    int a;
    int b=4;
    a=SQR(b+2);
    printf("%d\\n",a);
    return 0;
}
```

5. Develop a flowchart to find the roots and nature of roots of a quadratic equation.

6. Write a program to input Calls and calculate the total amount of a telephone bill for the following criteria using **switch case** statement.

Calls	Charge per call
1-150	0
151-250	.9
251-400	1.2
401 onwards	1.5

7. Write a program in C to find the sum of the given series after accepting the value of 'a' and 'n' from the console:
 $S = 1 + a^2 + a^3 + \dots +$ to n terms.

8. Find the output of the following programs. (a)

```
#include <stdio.h>
int main()
{
    int a = 60;
    int b = 13;
    int c;
    c = a & b;
    printf("%d\n", c );
    c = a | b;
    printf("%d\n", c );
    c = a ^ b;
    printf("%d", c );
    return 0;
}
```

(b)

```
#include <stdio.h>
int main()
{
    printf("%d",5<<3<<2<<1>>6);
    return 0;
}
```

9. Write a C program to check whether a given number (N) is a perfect number or not? [Perfect Number - A perfect number is a positive integer number which is equals to the sum of its proper positive divisors. For example 6 is a perfect number because its proper divisors are 1, 2, 3 and it's sum is equals to 6.]

10. Print the following pattern

```
1
2   4
3   5   7
6   8   10   12
9   11   13   15   17
```

11. Write a program to find the sum of the following series:

1-3+5-7+9-. . . upto n terms.

12. The length of three sides are taken as input. Write a C program to find whether a triangle can be formed or not. If not display "This Triangle is NOT possible." If the triangle can be formed then check whether the triangle formed is equilateral, isosceles, scalene or a right-angled triangle. (If it is a right-angled triangle then only print Right-angle triangle do not print it as Scalene Triangle).

13. Write a C program to print the following Pyramid pattern upto Nth row. Where N (number of rows to be printed) is taken as input.

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

14. Write a C Program to find Largest Element of an Integer Array. Here the number of elements in the array 'n' and the elements of the array is read from the test

data.

Use the printf statement given below to print the largest element. printf("Largest element = %d", largest);

15. Write a C Program to print the array elements in reverse order (Not reverse sorted order. Just the last element will become first element, second last element will become second element and so on) Here the size of the array, 'n' and the array elements is accepted from the test case data. The last part i.e. printing the array is also written. You have to complete the program so that it prints in the reverse order.