



**भारतीय सूचना प्रौद्योगिकी संस्थान गुवाहाटी**  
**Indian Institute of Information Technology Guwahati**  
**COMPUTER PROGRAMMING LAB (CS110)**  
**ASSIGNMENTS-03**

[Note: Do not use the scanf () function, switch-case and/or any loop construct.]

1. Execute the following program considering x in {0, 1, 5, 7, 10} and y in {0, 1}. Realize the causes of different outputs:

```
1  #include <stdio.h>
2
3  int main() {
4      int n = 7; // try with 0, 1, 5, 7, 10, and 20
5      int condition = 0; // try with 0 and 1
6
7      if (n == 5) {
8          printf("%d\n", __LINE__);
9      } else if (n % 2 == 0) {
10         if (n == 10 && condition == 1) {
11             printf("%d\n", __LINE__);
12         } else {
13             printf("%d\n", __LINE__);
14         }
15         printf("%d\n", __LINE__);
16     } else if (condition) {
17         printf("%d\n", __LINE__);
18     } else if (0) {
19         printf("%d\n", __LINE__);
20     } else {
21         printf("%d\n", __LINE__);
22     }
23
24     printf("%d\n", __LINE__);
25
26     return 0;
27 }
```

2. Write a program in C to find whether a given number is odd or even. Do not use the ?: operator.

3. Write a program in C to check whether a number is divisible by either 7 or 13, or not.
4. Write a program in C to check whether a number is divisible only by either of 7 and 13 (but not both), or not.
5. Write a program in C to check whether a number is negative, positive, or zero.
6. Write a program in C to find the maximum of two numbers. Do not use the ?: operator.
7. Write a program in C to check whether a character is an alphabet in English or not.
8. Write a program in C to check whether a character is an uppercase or lowercase alphabet.
9. Write a program in C to check whether a character is a vowel or consonant.
10. Write a program in C to check whether a character is an alphabet in English, a digit, or something else.
11. Write a program in C to input month as a number and print the number of days in that month.
12. Write a program in C to check whether a triangle is valid or not. Consider all angles of the triangles as inputs.
13. Write a program in C to check whether a triangle is valid or not. Consider all sides of the triangles as inputs.
14. Write a program in C to check whether a triangle is an equilateral, isosceles, or scalene triangle. Consider all sides of the triangles as inputs.
15. Write a program in C to check whether a number is Armstrong or not.
16. Write a program in C to input the basic salary of an employee and calculate his/her gross salary according to the following rules:
  - i. If basic salary is up to 30000 rupees, he/she gets 20% HRA and 30% DA.
  - ii. If basic salary is up to 60000 rupees but more than 30000 rupees, he/she gets 25% HRA and 35% DA.
  - iii. If the basic salary is more than 60000 rupees, he/she gets 30% HRA and 40% DA.
17. Write a program in C to calculate total electricity bill according to the given conditions:

- i. For the first 50 units, the cost is rupees 2.50/unit.
  - ii. For the next 75 units, the cost is rupees 3.00/unit.
  - iii. For the next 100 units, the cost is rupees 3.50/unit.
  - iv. For units above 225, the cost is Rs. 4.00/unit.
  - v. An additional surcharge of 20% applies to the total amount if more than 200 units are consumed.
18. Write a program in C to find if a year is a leap year. Do not use `&&`, `||`, and `?:` operators.
19. Write a program in C to find a minimum of three numbers. Do not use `&&`, `||`, and `?:` operators.
20. Consider a grading scheme as follows:

Marks	Grade
90 — 100	A
80 — 89	B
70 — 79	C
60 — 69	D
50 — 59	E
40 — 49	P
0 — 40	F

- i. Given marks, write a program in C to find the corresponding grade. If the input marks are more than 100 or less than 0, you should assign the grade 'X' to indicate an error with the input marks.
  - ii. Given marks, write a program in C to find the corresponding grade. If the input marks are more than 100 or less than 0, you should assign the grade 'X' to indicate an error with the input marks. Do not use `&&`, `||`, and `?:` operators.
  - iii. Given marks, write a program in C to find the corresponding grade. If the input marks are more than 100 or less than 0, you should assign the grade 'X' to indicate an error with the input marks. Do not use any `if-else` construct.
21. Write a program in C to check an input alphabet is in which category among the four:
- i. A small letter and a vowel.
  - ii. A capital letter and a consonant.
  - iii. A character in English but does not fall in the last two categories.
  - iv. Not a character in English (maybe a special character, e.g., \$).