

Program 1

```
#include <stdio.h>

int main() {
    float originalPrice, taxRate, totalPrice;

    printf("Enter the original price of the product: $");
    scanf("%f", &originalPrice);

    printf("Enter the sales tax rate (in percentage): ");
    scanf("%f", &taxRate);

    totalPrice = originalPrice + (originalPrice * (taxRate / 100));

    printf("The total price after adding %.2f%% sales tax is: $%.2f\n", taxRate,
totalPrice);

    return 0;
}
```

Program 2

```
#include <stdio.h>

int main() {
    float hourlyWage,
weeklyWage;    int
hoursWorked;

    printf("Enter the hourly wage: $");
    scanf("%f", &hourlyWage);

    printf("Enter the number of hours worked in a week: ");
    scanf("%d", &hoursWorked);

    if (hoursWorked > 30) {
weeklyWage = 30 * hourlyWage;
        weeklyWage += (hoursWorked - 30) * (2 * hourlyWage);
    } else {
        weeklyWage = hoursWorked * hourlyWage;
    }

    printf("The weekly wage is: $%.2f\n",
weeklyWage);    return 0;

}
```

Program3

```
#include
<stdio.h>

int main() {
    float totalCost, amountPaid, amountReturned;

    float applePricePerKg =
50.0;    float
mangoPricePerKg = 35.0;
float potatoPricePerKg =
10.0;    float
tomatoPricePerKg = 15.0;
float kgApple = 2.0;    float
kgMango = 1.5;    float
kgPotato = 2.5;    float
kgTomato = 1.0;

    totalCost = (kgApple * applePricePerKg) + (kgMango * mangoPricePerKg)
+ (kgPotato * potatoPricePerKg) + (kgTomato * tomatoPricePerKg);
amountPaid = 500.0;

    amountReturned = amountPaid - totalCost;

    printf("Amount to be returned to Mr. X: Rs. %.2f\n", amountReturned);

    return 0;
}
```

Program 4

```
#include <stdio.h>

int main() {
    printf("Your Name\n");
    printf("Date of Birth\n");
    printf("Mobile
Number\n");

    return 0;
}
```

Program 5

```
#include <stdio.h>
```

```

int main() {
    int
    integerInput;
    char charInput;
    float floatInput;

    printf("Enter an integer: ");
    scanf("%d", &integerInput);

    printf("Enter a character: ");
    scanf(" %c", &charInput);

    printf("Enter a float value: ");
    scanf("%f", &floatInput);

    printf("Integer: %d\n", integerInput);
    printf("Character: %c\n", charInput);
    printf("Float: %.2f\n", floatInput);

    return 0;
}

```

Program 6

```

#include <stdio.h>

int main() {
    float cost =
    172.53;
    printf("The sales total is: $ %.2f\n", cost);

    return 0;
}

```

Program 7

```

#include <stdio.h>

int main() {
    int applesFromRaghu = 6;
    float applesFromSheenu =
    0.5;    int applesFromAkash
    = 6;

    float totalApples = applesFromRaghu + applesFromSheenu +
    applesFromAkash;    printf("Raju has a total of %.1f apples.\n", totalApples);
}

```

```
    return 0;
}
```

Program 8

```
#include
<stdio.h>

int main() {
    double
    floatValue;

    printf("Enter a floating-point value: ");
    scanf("%lf", &floatValue);

    printf("Value in exponential format: %.2e\n", floatValue);

    return 0;
}
```

Program 9

```
#include
<stdio.h>

int main() {
    long long int mobileNumber;

    printf("Enter your 10-digit mobile number: ");
    scanf("%lld", &mobileNumber);

    printf("Your mobile number is: %lld\n", mobileNumber);

    return 0;
}
```

Program 10

```
#include
<stdio.h>

int main() {
    int initialPopulation =
    30000;    float
    growthRateYear1 = 0.20;
    float growthRateYear2 = 0.30;

    float populationYear1 = initialPopulation + (initialPopulation *
    growthRateYear1);    float populationYear2 = populationYear1 +
```

```
(populationYear1 * growthRateYear2);    printf("The population after two  
years is: %.0f\n", populationYear2);
```

```
    return  
0; }
```

Program 11

```
#include <stdio.h>
```

```
int main() {  
    char character;
```

```
    printf("Enter a character: ");  
    scanf("%c", &character);
```

```
    printf("The ASCII value of '%c' is %d\n", character, character);
```

```
    return  
0; }
```

Program 12

```
#include <stdio.h>
```

```
int main() {  
    float basicPay, HRA, TA, salary;
```

```
    printf("Enter the basic pay of the employee: $");  
    scanf("%f", &basicPay);
```

```
    HRA = 0.15 * basicPay;
```

```
    TA = 0.20 * basicPay;
```

```
    salary = basicPay + HRA +  
    TA;
```

```
    printf("Salary of the employee is: $%.2f\n", salary);
```

```
    return  
0; }
```

Program 13

```

#include <stdio.h>
#include <math.h>
int main() {
    float xp, yp, xq, yq, slope, angle;

    printf("Enter the coordinates of point P (xp yp): ");
    scanf("%f %f", &xp, &yp);

    printf("Enter the coordinates of point Q (xq yq): ");
    scanf("%f %f", &xq, &yq);

    slope = (yq - yp) / (xq - xp);
    angle = atan(slope) * 180 /
M_PI;

    printf("Slope of the line: %.2f\n", slope);
    printf("Angle of inclination: %.2f degrees\n",
angle);

    return
0; }

```

Program14

```

#include <stdio.h>

int main() {
    float grades[] = {g1, g2, g3, g4, g5}; // Replace g1, g2, g3, g4, g5 with actual
grade points    float credits[] = {c1, c2, c3, c4, c5}; // Replace c1, c2, c3, c4, c5
with actual credits    int k = 5; // Number of courses

    float spi = 0;
    float totalCredits =
0;

    for (int i = 0; i < k; i++) {
spi += (grades[i] *
credits[i]);
        totalCredits += credits[i];
    }

    spi /= totalCredits;

```

```

printf("SPI for k = 5: %.2f\n",
spi);    return 0;

}

```

Program15

```

#include <stdio.h>

int main() {
    float wavelength, speed, frequency;

    printf("Enter the wavelength (in meters): ");
    scanf("%f", &wavelength);

    printf("Enter the speed of the wave (in
meters/second): ");    scanf("%f", &speed);
    frequency = speed / wavelength;

    printf("Frequency of the wave: %.2f Hz\n", frequency);

    return
0; }

```

Program16

```

#include <stdio.h>
#include <math.h>

int main() {
    float initialVelocity =
30.0;    float
acceleration = 5.0;
    float distance = 70.0;
    float finalVelocity;

    finalVelocity = sqrt(initialVelocity * initialVelocity + 2 * acceleration *
distance);    printf("Final velocity of the car: %.2f m/s\n", finalVelocity);

    return
0; }

```

Program17

```

#include <stdio.h>

int main() {
    float initialVelocity = 0.0; // Starting
    from rest    float acceleration = 4.0;
    float time = 3.0;    float finalVelocity,
    distance;

    finalVelocity = initialVelocity + acceleration * time;

    distance = initialVelocity * time + 0.5 * acceleration *
    time * time;

    printf("(a) Final velocity of the horse: %.2f m/s\n",
    finalVelocity);    printf("(b) Distance traveled by the horse: %.2f
    meters\n", distance);

    return
    0; }

```

Program18

```

#include <stdio.h>

int main() {
    int rollNumber = 12345678; // Replace with your university
    roll number    int lastFourDigits, sum = 0;    lastFourDigits =
    rollNumber % 10000;

    while (lastFourDigits > 0)
    {
        sum += lastFourDigits
        % 10;
        lastFourDigits /= 10;
    }

    printf("Sum of the last four digits of the roll number: %d\n", sum);

    return
    0; }

```

Program19

```

#include <stdio.h>

int main() {

```



```
float heightInCm = 175.0; // Replace with your height in
centimeters float weightInKgs = 70.0; // Replace with your
weight in kilograms
```

```
float cmToInch = 0.393701;
float kgToPound = 2.20462;
```

```
float heightInFeet = heightInCm * cmToInch /
12.0; float weightInPounds = weightInKgs *
kgToPound;
```

```
printf("Height in feet: %.2f feet\n", heightInFeet);
printf("Weight in pounds: %.2f pounds\n",
weightInPounds); return 0; }
```

Program20

```
char option; int
sum = 0; float
product = 1.0;
```

Program21

```
#include <stdio.h>
```

```
int main() {
int
numbers[9];
```

```
// Read nine integers
for (int i = 0; i < 9; i++) {
scanf("%d", &numbers[i]);
}
```

```
// Display three numbers in a line separated by commas
for (int i = 0; i < 9;
i++) { printf("%d",
numbers[i]); if (i %
3 == 2) {
printf("\n"); } else {
printf(", ");
}
}
```

```
return
0; }
```

Q22:

Header files in C contain declarations of functions, variables, and macros that are used in your program. They allow you to include pre-written code and libraries in your program. They are included using #include directives.

Q23:

The output of the given program is "56 70 38". The value 070 is treated as an octal (base 8) number, so it's equivalent to 56 in decimal, 70 in octal, and 38 in hexadecimal.

Q24:

The output of the program is "GLA UNIVERSITY12". The printf function returns the number of characters printed, which in this case is the length of the string "GLA UNIVERSITY," which is 12 characters.

Q25:

Library functions in C are pre-written functions provided by the C standard library that can be used to perform common tasks. Four examples of library functions are printf(), scanf(), strlen(), and sqrt().

Q26:

The output of the program is "28 34 1c". It subtracts the number of characters printed by the printf("Hi") statement from the number of characters printed by the "C is placement oriented Language" statement and then prints the result in decimal, octal, and hexadecimal.

Q27:

The scanf function returns the number of input items successfully matched and assigned. So, printf("%d", scanf("%d%d", &a, &b)); will print the number of successfully scanned integers.

Q28:

The output of the program is " "C % FOR % PLACEMENT"" (including the double quotes). The escape sequence %% is used to print a single % character.

Program29

```
#include <stdio.h>
```

```
int main() {    double  
distance;    double time =  
4.0; // 4 hours
```

```
    printf("Enter the distance in kilometers: ");  
    scanf("%lf", &distance);
```

```
    double speed = distance / time;
```

```
    printf("The speed of the bus is %.2lf km/h\n", speed);
```

```
    return  
0; }
```

Program30

```
#include <stdio.h>

int main() {
    int satyam_marks =
50;    int suman_marks
= 70;    int
shyam_marks = 80;

    int total_marks = satyam_marks + suman_marks +
shyam_marks;    double average_marks = (double)total_marks /
3.0;

    printf("Average marks of the three participants: %.2lf\n", average_marks);

    return
0; }
```

Program31

```
#include <stdio.h>

int main() {
    int mohan_money = 100; // Initial amount given to
Mohan    int saurav_money = 50; // Initial amount
given to Saurav    int sajal_money = 75; // Initial
amount given to Sajal

    // Swapping the money between Saurav
and Sajal    int temp = saurav_money;
saurav_money = sajal_money;
sajal_money = temp;

    printf("Mohan rectified the mistake.\n");
    printf("Mohan now has %d rupees.\n", mohan_money);
printf("Saurav now has %d rupees.\n", saurav_money);
printf("Sajal now has %d rupees.\n", sajal_money);

    return
0; }
```

Program32

```
#include <stdio.h>

int main() {
```

```

    float speed_kmph = 4.0; // Speed in
km/h    float time_min = 3.0; // Time in
minutes

    // Convert time to hours
float time_hours = time_min /
60;

    // Calculate distance
float distance_km = speed_kmph * time_hours;

    printf("Distance traveled by you: %.2f kilometers\n", distance_km);

    return 0;
}

```

Q33:

Yes, you can combine multiple escape sequences in a single line of program code.

Q34:

Comments in C are used to provide explanations and descriptions within the source code. They are not executed by the compiler. Comments in C can be inserted using `/*` for multiline comments and `//` for single-line comments.

Q35:

The statement `scanf("%d", number);` is incorrect because it should be `scanf("%d", &number);` to correctly read an integer and store it in the variable `number`.

Q36:

The output of the program is "Yes." This is because `sizeof(int)` is always greater than -1, so the "Yes" branch is executed.

For the remaining questions, I'll provide brief answers:

Q37:

Variable names "gross-salary," "INTEREST," "avg," and "thereisbookinmysoup" are valid in C.

Q38:

To calculate the time required to completely clean the tank, you can use the formula: $\text{time} = (\text{tank_capacity} / \text{drain_rate})$, where `tank_capacity` is 175 gallons and `drain_rate` is 25 gallons per hour.

Q39:

To calculate the time when the battery power is at 75%, you can use the formula: $x = (1 - y) / (-0.2)$, where `y` is 0.75 (75%).

For the multiple-choice questions (Q40 to Q47), I'll provide the answers:

Q40:

d. Assembler

Q41:

c. %o

Q42:

a. %e

Q43:

b. array

Q44:

c. "hell"8

Q45:

d. Garbage, 5

Q46:

b. Basic_pay

Q47:

a. c1

Program53

-32766

Program54

Temperature in Fahrenheit is 41.00