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;

}

Program 3 #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; }

Program 14

#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;

}

Program 15

#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; }

Program 16

#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; }

Program 17

#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; }

Program 18

#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; }

Program 19

#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; }

Program 20 char option; int sum = 0; float product = 1.0;

Program 21

#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. Program 29

#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; }

Program 30

#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; }

Program 31

#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; }

Program 32

#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: time =

(tank\_capacity / 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:

1. %e

Q43:

1. array

Q44:

1. "hell"8

Q45:

1. Garbage, 5

Q46:

b. Basic\_pay

Q47:

a. c1

Program 53

-32766

Program 54

Temperature in Fahrenheit is 41.00