**Assignment:**

**Q-1:**

**Sol:**

#include <stdio.h>

int main() {

float originalPrice, taxRate;

printf("Enter the original price of the product: $");

scanf("%f", &originalPrice);

printf("Enter the tax rate (in percentage): ");

scanf("%f", &taxRate);

float taxAmount = (originalPrice \* taxRate) / 100;

float finalPrice = originalPrice + taxAmount;

printf("Original Price: Rs.%.2f\n", originalPrice);

printf("Tax Amount: Rs.%.2f\n", taxAmount);

printf("Final Price (including tax): Rs.%.2f\n", finalPrice);

return 0;

}

**Q-2**

**Sol.**

#include <stdio.h>

int main() {

double HourlyWage, TotalHoursWorked, WeeklyWages;

printf("Enter the hourly wage: $");

scanf("%lf", &HourlyWage);

printf("Enter the total hours worked in a week: ");

scanf("%lf", &TotalHoursWorked);

// Calculate the weekly wages

if (TotalHoursWorked <= 30) {

WeeklyWages = HourlyWage \* TotalHoursWorked;

} else {

double BasePay = 30 \* HourlyWage;

double ExtraHours = TotalHoursWorked - 30;

double ExtraPay = ExtraHours \* (HourlyWage \* 2);

WeeklyWages = BasePay + ExtraPay;

}

printf("Weekly wages: $%.2lf\n", WeeklyWages);

return 0;

}

**Q-3**

**Sol.**

#include <stdio.h>

int main() {

float apple\_price\_per\_kg = 50.0;

float mango\_price\_per\_kg = 35.0;

float potato\_price\_per\_kg = 10.0;

float tomato\_price\_per\_kg = 15.0;

float apple\_weight = 2.0;

float mango\_weight = 1.5;

float potato\_weight = 2.5;

float tomato\_weight = 1.0;

float total\_cost = (apple\_weight \* apple\_price\_per\_kg) + (mango\_weight \* mango\_price\_per\_kg) + (potato\_weight \* potato\_price\_per\_kg) + (tomato\_weight \* tomato\_price\_per\_kg);

float currency\_with\_x = 500.0;

if (total\_cost > currency\_with\_x) {

printf("Mr. X does not have enough money to make the purchase.\n");

} else {

float amount\_returned = currency\_with\_x - total\_cost;

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

}

return 0;

}

**Q-4**

**Sol.**

#include <stdio.h>

int main() {

printf("Name : Sarthak Srivastava\n");

printf("Date of Birth: December 13, 2003\n"); // Replace with your actual date of birth

printf("Mobile Number: 8299059023\n"); // Replace with your actual mobile number

return 0;

}

**Q-5**

**Sol.**

#include <stdio.h>

int main() {

int intValue;

char charValue;

float floatValue;

printf("Enter an integer: ");

scanf("%d", &intValue);

printf("Enter a character: ");

scanf(" %c", &charValue);

printf("Enter a float value: ");

scanf("%f", &floatValue);

printf("Integer: %d\n", intValue);

printf("Character: %c\n", charValue);

printf("Float: %.2f\n", floatValue);

return 0;

}

**Q-6**

**Sol.**

#include <stdio.h>

int main() {

double cost = 172.53;

printf("The sales total is : $ %.2lf\n", cost);

return 0;

}

**Q-7**

**Sol.**

#include <stdio.h>

int main() {

float apples\_from\_Raghu, apples\_from\_Sheenu, apples\_from\_Akash;

printf("Enter the number of apples Raju got from Raghu: ");

scanf("%f", &apples\_from\_Raghu);

printf("Enter the number of apples Raju got from Sheenu: ");

scanf("%f", &apples\_from\_Sheenu);

printf("Enter the number of apples Raju got from Akash: ");

scanf("%f", &apples\_from\_Akash);

float total\_apples = apples\_from\_Raghu + apples\_from\_Sheenu + apples\_from\_Akash;

printf("Raju has a total of %.2f apples without adding them manually.\n", total\_apples);

return 0;

}

**Q-8**

**Sol.**

#include <stdio.h>

int main() {

double value = 1234.56789;

printf("%.2e\n", value);

return 0;

}

**Q-9**

**Sol.**

#include <stdio.h>

int main() {

long long int mobileNumber;

printf("Please enter your 10-digit mobile number: ");

scanf("%lld", &mobileNumber);

if (mobileNumber >= 1000000000LL && mobileNumber <= 9999999999LL) {

printf("You entered the mobile number: %lld\n", mobileNumber);

} else {

printf("Invalid input. Please enter a 10-digit mobile number.\n");

}

return 0;

}

**Q-10**

**Sol.**

#include <stdio.h>

int main() {

int population = 30000;

population = population + (0.20 \* population);

population = population + (0.30 \* population);

printf("Population after two years: %d\n", population);

return 0;

}  
**Q-11**

**Sol.**

#include <stdio.h>

int main() {

char character;

printf("Enter a character: ");

scanf("%c", &character);

// Use the %d format specifier to print the ASCII value

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

return 0;

}

**Q-12**

**Sol.** #include <stdio.h>

int main() {

float basicPay, hra, ta, salary;

printf("Enter the basic pay: ");

scanf("%f", &basicPay);

hra = 0.15 \* basicPay;

ta = 0.20 \* basicPay;

salary = basicPay + hra + ta;

printf("Basic Pay: %.2f\n", basicPay);

printf("HRA: %.2f\n", hra);

printf("TA: %.2f\n", ta);

printf("Total Salary: %.2f\n", salary);

return 0;

}

**Q-13**

**Sol.**

#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;

}

**Q-14**

**Sol.**

#include <stdio.h>

int main() {

float grades[] = {g1, g2, g3, g4, g5};

float credits[] = {c1, c2, c3, c4, c5};

int k = 5;

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);

return0;

**Q-15**

**Sol.** #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;

}

**Q-16**

**Sol.**

#include <stdio.h>

#include <math.h>

int main() {

float initialVelocity =3 0.0;

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;

}

**Q-17**

**Sol.**

#include <stdio.h>

int main() {

float initialVelocity = 0.0;

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;

}

**Q-18**

**Sol.**

#include <stdio.h>

int main() {

int roll\_number = 1234567;

int last\_four\_digits = roll\_number % 10000;

int sum = 0;

while (last\_four\_digits > 0) {

sum += last\_four\_digits % 10;

last\_four\_digits /= 10;

}

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

return 0;

}

**Q-19**

**Sol.**

#include <stdio.h>

int main() {

float heightInCm = 165.0;

float weightInKgs = 70.0;

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;

}

**Q-20**

**Sol.**

a) char option;

b) int sum = 0;

c) float product = 1.0;

**Q-21**

**Sol.**

#include <stdio.h>

int main() {

int numbers[9];

printf("Enter nine integers:\n");

for (int i = 0; i < 9; i++) {

scanf("%d", &numbers[i]);

}

printf("Numbers in groups of three separated by commas:\n");

for (int i = 0; i < 9; i++) {

printf("%d", numbers[i]);

if ((i + 1) % 3 != 0) {

printf(", ");

} else {

printf("\n");

}

}

return 0;

}

**Q-22**

**Ans.** Header files in C contain declarations of functions, variables, and macros that are used in your program. These are the preprocessor directive to include standard input/output functions in the program.

Example- #include<stdio,h>, #include<conio.h>, int main(void), etc.

**Q-23**

**Ans.** 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.

**Q-24**

**Ans.** 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.

**Q-25**

**Ans.** Library functions, also known as standard library functions, are pre-written functions that are part of a programming language's standard library. Library functions are designed to be reusable and save time in software development.

Four examples of library functions are printf(), scanf(), strlen(), and sqrt().

**Q-26**

**Ans.** 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.

**Q-27**

**Ans.** 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.

**Q-28**

**Ans.** The output of the program is " "C % FOR % PLACEMENT"" (including the double quotes). The

escape sequence %% is used to print a single % character.

**Q-29**

**Sol.**

#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;

}

**Q-30**

**Sol.**

#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;

}

**Q-31**

**Sol.**

#include <stdio.h>

int main() {

int mohan\_money = 100;

int saurav\_money = 50;

int sajal\_money = 75;

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;

}

**Q-32**

**Sol.**

#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;

}

**Q-33**

**Ans.** Yes, we can combine multiple escape sequences in a single line of program code.

**Q-34**

**Ans.** 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.

**Q-35**

**Ans.** 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.

**Brief Answers for next questions:**

**Q-36**

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

**Q-37**

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

**Q-38**

**Ans.** 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.

**Q-39**

**Ans.** 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%).

**Correct options for Multiple-Choice Questions (Q-40 to Q-47):**

**Q-40**

**Ans.**(d) Assembler.

**Q-41**

**Ans.** (c) %o.

**Q-42**

**Ans.**(a) %e.

**Q-43**

**Ans.**  (b) array.

**Q-44**

**Ans.** (c) "hell"8.

**Q-45**

**Ans.** (d) Garbage, 5.

**Q-46**

**Ans.** (b) Basic\_pay.

**Q-47:**

**Ans** (a) c1.

**Q-53**

**Ans.** -32766.

**Q-54**

**Ans.** Temperature in Fahrenheit is 41.00.