**Assignment**

Q1. Write a C program for calculating the price of a product after adding the sales tax to its original price. Where rate of tax and price is inputted by user.

#include<stdio.h>

int main(){

int cost,tax\_rate,sales\_tax,final\_price;

printf("enter product price");

scanf("%d",&cost);

printf("enter rate of tax");

scanf("%d",&tax\_rate);

sales\_tax = cost\*(tax\_rate)/100;

printf("Sales tax; %d\n",sales\_tax);

final\_price= cost+sales\_tax;

printf("Final price of product is: %d",final\_price);

return 0;

}

Q2. Write a C program to calculate the weekly wages of an employee. The pay depends on wages per hour and number of hours worked. Moreover, if the employee has worked for more than 30 hours, then he or she gets twice the wages per hour, for every extra hour that he or she has worked.

#include <stdio.h>

int main() {

float HourlyWage, WeeklyWages;

int HoursWorked;

printf("Enter hourly wage ");

scanf("%f", &HourlyWage);

printf("Enter hours worked this week ");

scanf("%d", &HoursWorked);

if (HoursWorked <= 30) {

WeeklyWages = HourlyWage \* HoursWorked;

} else {

int RegularHours = 30;

int OvertimeHours = HoursWorked - RegularHours;

WeeklyWages = (HourlyWage \* RegularHours) + (HourlyWage \* 2 \* OvertimeHours);

}

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

return 0;

}

Q.3 Mr. X goes to market for buying some fruits and vegetables. He is having a currency of Rs 500 with him for marketing. From a shop, he purchases 2.0 kg Apple priced Rs. 50.0 per kg, 1.5 kg Mango priced Rs.35.0 per kg, 2.5 kg Potato priced Rs.10.0 per kg, and 1.0 kg Tomato priced Rs.15 per kg. He gives the currency of Rs. 500 to the shopkeeper. Find out the amount shopkeeper will return to X by writing a C program.

#include <stdio.h>

int main() {

float applePricePerKg = 50.0;

float mangoPricePerKg = 35.0;

float potatoPricePerKg = 10.0;

float tomatoPricePerKg = 15.0;

float appleQty = 2.0;

float mangoQty = 1.5;

float potatoQty = 2.5;

float tomatoQty = 1.0;

float appleCost = applePricePerKg \* appleQty;

float mangoCost = mangoPricePerKg \* mangoQty;

float potatoCost = potatoPricePerKg \* potatoQty;

float tomatoCost = tomatoPricePerKg \* tomatoQty;

float totalCost = appleCost + mangoCost + potatoCost + tomatoCost;

float currencyWithMrX = 500.0;

float amountToReturn = currencyWithMrX - totalCost;

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

return 0;

}

Q4.Write a C program to print your name, date of birth and mobile number in 3 different lines.

#include <stdio.h>

int main() {

printf("Name: Aditya Raj\n");

printf("Date of Birth: 17/03/2005\n");

printf("Mobile Number: 7070347016\n");

return 0;

}

Q5.Write a program to read an integer, a character and a float value from keyboard and display the same in different lines on the screen.

#include <stdio.h>

int main() {

int integerInput;

char charInput;

float floatInput;

printf("Enter an integer: \n");

scanf("%d", &integerInput);

while (getchar() != '\n');

printf("Enter a character: \n");

scanf("%c", &charInput);

printf("Enter a float value: \n");

scanf("%f", &floatInput);

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

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

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

return 0;

}

Q6.Write a program to print the following line ( Assume the total value is contained in a variable named cost)

The sales total is : $ 172.53

#include <stdio.h>

int main() {

float cost = 172.53;

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

return 0;

}

Q7.Raju got 6 and half apples from each of Raghu, Sheenu and Akash. He wants to know how many apples he has in total without adding them. Write a program which could help Raju in doing this.

#include <stdio.h>

int main() {

float applesFromRaghu = 6.5;

float applesFromSheenu = 6.5;

float applesFromAkash = 6.5;

float totalApples = applesFromRaghu + applesFromSheenu + applesFromAkash;

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

return 0;

}

Q8.Write a program that prints the floating point value in exponential format correct to two decimal places.

**NOT UNDERSTOOD**

Q9.Write a program to input and print your mobile number (i.e. of 10 digits).

#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;

}

Q10.The population of a city is 30000. It increases by 20 % during first year and 30% during the second year. Write a program to find the population after two years? (Ans: 46800)

#include <stdio.h>

int main() {

int initialPopulation = 30000;

float growthRate1 = 0.20;

float growthRate2 = 0.30;

int populationAfterYear1 = initialPopulation + (initialPopulation \* growthRate1);

int populationAfterYear2 = populationAfterYear1 + (populationAfterYear1 \* growthRate2);

printf("Population after two years: %d\n", populationAfterYear2);

return 0;

}

Q11. Write a program to find the ASCII value of a character.

#include <stdio.h>

int main() {

char ch;

printf("Enter a character: ");

scanf(" %c", &ch);

int asciiValue = (int)ch;

printf("ASCII value of '%c' is %d\n", ch, asciiValue);

return 0;

}

Q12. Write a program to calculate salary of an employee, given his basic pay (entered by user), HRA=15% of the basic pay and TA=20% of the basic pay.

#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("Salary = %.2f\n", salary);

return 0;

}

Q13. Write a program to find the slope of a line and angle of inclination that passes through two points P and Q with coordinates (xp, yp) and (xq, yq) respectively.

#include <stdio.h>

#include <math.h>

int main() {

double xp, yp, xq, yq;

double slope, angle;

printf("Enter the coordinates of point P (xp yp): ");

scanf("%lf %lf", &xp, &yp);

printf("Enter the coordinates of point Q (xq yq): ");

scanf("%lf %lf", &xq, &yq);

if (xq - xp != 0) {

slope = (yq - yp) / (xq - xp);

} else {

printf("The line is vertical, and the slope is undefined.\n");

return 0;

}

angle = atan(slope) \* 180.0 / M\_PI;

printf("Slope of the line: %.2lf\n", slope);

printf("Angle of inclination (degrees): %.2lf\n", angle);

return 0;

}

Q14. The SPI (Semester Performance Index) is a weighted average of the grade points earned by a student in all the courses he registered for in a semester. If the grade points associated with the letter grades awarded to a student are g1, g2, g3,…….gk etc. and the corresponding credits are c1, c2, c3,.…..ck, the SPI is given by:

Where, k is the number of courses for which the candidate remains registered for during the semester/ trimester. Write a program in C to calculate SPI for k =5.

Q 15. Write a program to calculate the frequency (f) of a given wave with wavelength (λ) and speed (c), where c=λ\*f.

#include <stdio.h>

int main() {

double wavelength, speed, frequency;

printf("Enter the wavelength (in meters): ");

scanf("%lf", &wavelength);

printf("Enter the speed of the wave (in meters per second): ");

scanf("%lf", &speed);

frequency = speed / wavelength;

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

return 0;

}

Q 16A car travelling at 30 m/s accelerates steadily at 5 m/s2 for a distance of 70 m. What is the final velocity of the car? [Hint: v2 = u2 + 2as]

#include <stdio.h>

#include <math.h>

int main() {

double initialVelocity = 30.0;

double acceleration = 5.0;

double distance = 70.0;

double finalVelocity = sqrt(pow(initialVelocity, 2) + 2 \* acceleration \* distance);

printf("The final velocity of the car is %.2lf m/s\n", finalVelocity);

return 0;

}

Q 17.A horse accelerates steadily from rest at 4 m/s2 for 3s. (a) What is its final velocity? (b) How far has it travelled? [Hint: (a) v = u + at (b) s = ut + ½at2 ]

#include <stdio.h>

int main() {

double u = 0.0;

double a = 4.0;

double t = 3.0;

double v = u + (a \* t);

double distance = (u \* t) + (0.5 \* a \* t \* t);

printf("(a) The final velocity of the horse is %.2lf m/s\n", v);

printf("(b) The horse has traveled a distance of %.2lf meters\n", distance);

return 0;

}

Q 18. Write a program to find the sum of your four last digit of your university roll number .

#include <stdio.h>

int main() {

char rollNumber[20];

int lastFourDigits = 0;

printf("Enter your university roll number: ");

scanf("%s", rollNumber);

int i = 0;

int len = printf("rollNumber");

if (len >= 4) {

for (i = len - 4; i < len; i++) {

if (rollNumber[i] >= '0' && rollNumber[i] <= '9') {

lastFourDigits += (rollNumber[i] - '0');

}

}

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

} else {

printf("Invalid roll number format. It should have at least four digits.\n");

}

return 0;

}

Q19. Write a program to initialize your height and weight in cm. and kgs respectively demonstrating compile time initialization and convert them in feets and pounds respectively. **Note :- 1 cm = 0.393701inch , 1 Kg = 2.20462**

#include <stdio.h>

int main() {

double heightInCm = 175.0;

double weightInKg = 70.0;

double cmToInch = 0.393701 ;

double kgToPounds = 2.20462;

double heightInInch = heightInCm \* cmToInch;

double weightInPounds = weightInKg \* kgToPounds;

printf("Height: %.2f cm\n", heightInCm);

printf("Height: %.2f inch\n", heightInInch);

printf("Weight: %.2f kg\n", weightInKg);

printf("Weight: %.2f pounds\n", weightInPounds);

return 0;

}

Q 20 . Code the variable declarations for each of following:

1. A character variable named option.

Ans – char option;

1. An integer variable sum initialized to 0

Ans- int sum=0

1. A floating point variable, product, initialized to

Ans- float product = 1.0;

Q21. Write a program that reads nine integers. Display these numbers by printing three numbers in a line separated by commas.

#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(",\n");

} else {

printf(", ");

}

}

return 0;

}

Q22. What are header files and what are its uses in C programming?

Ans-A header file is a text file that contains pieces of code written in the C programming language. The name of a header file, by convention, ends with the . h extension. It is inserted inside a program by coding the #include preprocessor directive.

Q23. What will be the output of following program?

#include<stdio.h>

int main()

{ int num=070;

printf(“%d\t%o\t%x”,num,num,num);

}

Ans- 56 70 38

Q 24. What will be the output of following program?

#include <stdio.h>

void main()

{

int x = printf("GLA UNIVERSITY");

printf("%d", x);

Ans – . GLA UNIVERSITY14

Q25. What are library functions? List any four library functions.

Ans- Library functions in programming are pre-defined functions that are part of a standard library or libraries provided by the programming language or operating system. The four library functions are – printf, scanf, **strlen and rand.**

Q26. What will be the output of following program?

#include <stdio.h>

void main()

{

int x = printf("C is placement oriented Language") – printf(“Hi”);

printf("%d %o %x", x,x,x);

}

Ans – 31 37 1f

Q27. What is the meaning of following statement? printf(“%d”,scanf(“%d%d”,&a,&b));

Ans- In this program fir the input will be taken from user in variables a and b then then both will be printed.

Q28. What will be the output of following program?

#include <stdio.h>

void main()

{

printf(" \"C %% FOR %% PLACEMENT\"");

}

Ans- “C % FOR % PLACEMENT”

Q29. Suppose distance between GLA University and Delhi is m km (to be entered by user), by BUS you can reach Delhi in 4 hours. Develop a ‘C’ program to calculate speed of bus.

#include <stdio.h>

int main() {

double distance, time, speed;

printf("Enter the distance between GLA University and Delhi (in kilometers): ");

scanf("%lf", &distance);

time = 4.0;

speed = distance / time;

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

return 0;

}

Q30. In an exam Satyam got 50 marks, Suman got 70 marks and Shyam got 80 marks, Write a ‘C’ program to find average marks of these three participants.

#include <stdio.h>

int main() {

int satyamMarks = 50;

int sumanMarks = 70;

int shyamMarks = 80;

int totalMarks;

float averageMarks;

totalMarks = satyamMarks + sumanMarks + shyamMarks;

averageMarks = (float)totalMarks / 3;

printf("Average marks of Satyam, Suman, and Shyam: %.2f\n", averageMarks);

return 0;

}

Q31. One day, Mohan called Saurav and Sajal and gave some money to them, later he realized that money that was given to Saurav should be given to Sajal and vice-versa. Develop a ‘C’ program to help Mohan so that he can rectify his mistake.

#include <stdio.h>

int main() {

double sauravMoney, sajalMoney, temp;

printf("Enter the amount of money given to Saurav: ");

scanf("%lf", &sauravMoney);

printf("Enter the amount of money given to Sajal: ");

scanf("%lf", &sajalMoney);

temp = sauravMoney;

sauravMoney = sajalMoney;

sajalMoney = temp;

printf("After rectifying the mistake:\n");

printf("Amount given to Saurav: %.2lf\n", sauravMoney);

printf("Amount given to Sajal: %.2lf\n", sajalMoney);

return 0;

}

Q32. One day when I was going for a lunch, suddenly rain started, I was very hungry so started running with speed of 4km/h and it took 3 min to reach mess. Help me to develop a ‘C’ program to calculate distance travelled by me.

#include <stdio.h>

int main() {

double speed = 4.0;

double time = 0.05;

double distance;

distance = speed \* time;

printf("You traveled %.2f kilometers to reach the mess.\n", distance);

return 0;

}

Q33. Can two or more escape sequences such as \n and \t be combined in a single line of program code?

Ans - Yes

Q34. What are comments and how do you insert it in a C program?

Ans- Comments in a C program are used to provide explanatory notes or descriptions within the source code. Comments are ignored by the C compiler and are meant for human readers to understand the code better. In C, there are two main ways to insert comments:-

1. Single line comments
2. Multiple line comments

Q35. What is wrong in this statement? scanf(“%d”,number);

Ans- Ampersand(&) is not used before number.

Q36. What will be the output?

#include <stdio.h>

int main()

{

if (sizeof(int) > -1)

printf("Yes");

else

printf("No");

return 0;

}

Ans- No

Q37. Point out which of the following variable names are invalid:

gross-salary INTEREST , salary of emp , avg. , thereisbookinmysoup

Ans- “salary of emp” and “avg.”.

Q38. Tom works at an aquarium shop on Saturdays. One Saturday, when Tom gets to work, he is asked to clean a 175-gallon reef tank. His first job is to drain the tank. He puts a hose into the tank and starts a siphon. Tom wonders if the tank will finish draining before he leaves work. He measures the amount of water that is draining out and finds that 12.5 gallons drain out in 30 minutes. So, he figures that the rate is 25 gallons per hour. Develop a ‘C’ program to help Tom to calculate time required to completely clean tank.

#include <stdio.h>

int main() {

int tank\_capacity = 175;

double drain\_rate = 25.0;

double time\_required;

time\_required = tank\_capacity / drain\_rate;

printf("It will take %.2f hours to completely clean the tank.\n", time\_required);

return 0;

}

Q39. The percent y (in decimal form) of battery power remaining x hours after you turn on a laptop computer is y = −0.2 x + 1. Develop a ‘C’ program to calculate after how many hours the battery power is at 75%?

#include <stdio.h>

int main() {

double battery\_power = 0.75;

double hours;

hours = (1 - battery\_power) / -0.2;

printf("The battery power is at 75%% after %.2f hours.\n", hours);

return 0;

}

Q40.Which of the following is used to convert the high level language in machine language in a single go?

a. Compiler b.Interpreter

c. Linker d.Assembler

Ans- Compiler

Q 41. What is the format specifier for an Octal Number?

a.%0 b.%d

c. %o d. %e

Ans- %o

Q 42. Which format specifier is used to print the exponent value upto 2 decimal places.

a. %e b.%.2f c. %f d.%.2e

Ans- %.2e

Q 43. Which of the following is not a basic data type?

a. char

b. array

c. float

d. int

Ans - array

Q 44. What is the output of following code?

#include<stdio.h>

void main()

{

int x=0;

x= printf("\"hello\b\"");

printf(“%d”,x);

}

a. hello7 b. “hello”7 c. “hell”8 d. hell8

Ans – “hell”8

Q 45. What is the output of following code?

#include<stdio.h>

void main()

{

int b,c=5 ;

int(“%d , %d”, b,c);

}

a. 5, 5 b. 5, 5.000000

c. Garbage, 5.000000 d. Garbage, 5

Ans – Garbage, 5

Q46. Which of the following is an identifier?

a. &fact b. Basic\_pay c. enum d. 1sum

Ans- %fact

Q 47. What is the output of the following program?

#include<stdio.h>

void main()

{

char x, a=’c’;

x=printf("%c",a);

printf(“%d”,x);

}

a. c1 b. cgarbage

c. 1 c. c

Ans- c

Q48. Perform the following conversion from Decimal to other number as directed-

1. (365.55)10 = (?)2
2. (453.65)10 = (?)8
3. (5164.12)10 = (?)16
4. (23.65)10 = (?)5
5. (772)10 = (?)7

Ans a- (101101101.1001001100110011)2

b- (705.54)8

c- (1434.21)16

d- (43.34134)5

e- (1311)7

Q49. Covert the following numbers to decimal number system-

1. (325.54)6 = (?)10
2. (1001010110101.1110101)2 = (?)10
3. (742.72)8 = (?)10
4. (AC94.C5)16 = (?)10

Ans- a- (125.9444...)10

b- (5793.9140625)10

c- (482.90625)

d- (44180.76953125)

Q50. Perform the following conversion from Hexadecimal to other number as directed-

(DB56.CD4)16 = (?)2, (?)8, (?)4

Ans- (1101101101010110.110011010100)2,

(333252.324)8,

(55422.7993164)10

Q51. Perform the following conversion from octal to other number as directed-

(473.42)8 = (?)2, (?)10, (?)16, (?)5

Ans- (100111001.100010)2

(387.34)10

(473.42)16

(431.42)5

Q52. Find the value of A?

1. (23)10 = (17)A
2. (21)16 = (41)A
3. (32)8 = (101)A

Ans a- A= 1.35294

b- A=0.80488

c- A= 0.25743

Q53: What will be the output of following program? Assume integer is of 2 bytes

void main(){

int a=32770;

printf(“%d”,a);

}

Ans- -32766

Q54: #include <stdio.h>

int main()

{

float c = 5.0;

printf ("Temperature in Fahrenheit is %.2f", (9/5)\*c + 32);

return 0;

}

Ans- Temperature in Fahrenheit is 41.00