

ASSIGNMENT

1. 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.

Ans: #include <stdio.h>

int main()

{

float total price, original price, rate, total tax;

printf("Enter original price and rate(in percentage) : ");

scanf("%f%f", &original price, &rate);

total tax=(original price*(rate/100));

printf("\n%f", &total tax);

total price=original price+total tax;

printf("\n%f", total price);

}

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.

Ans: #include <stdio.h>

int main() {

[//hours](#) worked=w2

[//weekly](#) wages=w3

//normal hours=n1

//Over time hours=n2

float w1, w2, w3;

printf("Enter the w1: \$");

scanf("%f", &w1);

printf("Enter the w2 in a week: ");

```

scanf("%f", &w2);
if (w2<= 30) {
    w3 = w1 * w2;
} else {
    float n1 = 30;
float n2 = w2 - n1;
    w3 = (w1 * n1) + (2 * w1* n2);
}
printf("w3: $%.2f\n",w3);
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.

Ans:#include <stdio.h>

```
int main() {
```

```
/*
```

```
Apple price=a1
```

```
float a1= 50.0;
```

```
float m1 = 35.0;
```

```
float p1 = 10.0;
```

```
float t1 = 15.0;
```

```
float a2= 2.0;
```

```
float m2= 1.5;
```

```
float p2= 2.5;
```

```
float t2= 1.0;
```

```

float finalAppleCost = a1 *a2;
float finalMangoCost = m1 *m2;
float finalpotatecost= p1 *p2;
float finalTomatoCost = t1*t2;
    float finalCost = finalAppleCost + finalMangoCost +
finalPotatoCost + finalTomatoCost;
    float totalamountGiven = 500.0;
    float totalamountToReturn = amountGiven - finalCost;
    printf("The shopkeeper will return Rs. %.2f to Mr. X.\n",
totalamountToReturn);
return 0;}

```

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

Ans: #include <stdio.h>

Int main()

{

printf("Name :Tarun kushwah\nD.O.B:10december2004\nmobile number: 8267971606");

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.

Ans: #include <stdio.h>

int main()

{

int i;

char c;

float f;

scanf("%d %c %f",&i,&c,&f);

printf("\nInteger is:%d",i);

printf("\ncharacter is:%c",c);

```
    printf("\nfloat is:%f",f);
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.

Ans: #include <stdio.h>

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

Ans:

```
#include <stdio.h>
int main (){
float apple_from_each = 6.5, people = 3;
printf("%f",apple_from_each*people);
return 0;
}
```

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

Ans: #include <stdio.h>

```
int main() {
    float num;
    scanf("%f", &num);
    printf("%.2e", num);
}
```

```
    return 0;
}
```

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

Ans: #include<stdio.h>

```
int main(){
    long int n;
    printf("enter your mobile number");
    scanf("%ld",&n);
    printf("%ld",n);
    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)

Ans: #include <stdio.h>

```
int main() {
    int initial Population = 30000;
    float increase rate of 1st year = 0.20;
    float increase population 2nd year = 0.30;
    int population of Year1 = initialPopulation + (int)(initialPopulation *
increase rate of 1st year);
    int population of Year2 = population of Year1 +
(int)(populationYear1 * increase population 2nd year);
    printf("Population after two years: %d\n", population of Year2);
    return 0;
}
```

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

Ans: #include<stdio.h>

```
int main()
{
```

```

        char x;
printf("enter the character");
        scanf("%c",&x);
        printf("%d",x);
        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.

Ans:#include<stdio.h>

```

int main()
{
    float basic pay,da,pf,it,sal,hra,ta;
    float net_salary;
    printf("enter basic salary");
    scanf("%f",&basic pay);
    printf("enter hra");
    scanf("%f",&hra);
    printf("enter ta");
    scanf("%f",&ta);
    da=(basic pay*12)/100;
    pf=(basic pay*14)/100;
    it=(basic pay*15)/100;
    net_salary=basic pay+da+hra+ta-(pf+it);
    printf("net salary is:%f\n",net_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.

Ans:#include <stdio.h>

```

#include <math.h>
int main() {
    double xp, yp, xq, yq, 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);
    slope = (yq - yp) / (xq - xp);
    angle = atan(slope);
    angle = angle * (180.0 / M_PI);
    printf("Slope of the line: %.2lf\n", slope);
    printf("Angle of inclination (in degrees): %.2lf degrees\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 $g_1, g_2, g_3, \dots, g_k$ etc. and the corresponding credits are $c_1, c_2, c_3, \dots, c_k$, the SPI is given by:

$$SPI = \frac{\sum_{i=1}^k c_i g_i}{\sum_{i=1}^k c_i}$$

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 $k = 5$.

Ans: #include <stdio.h>

```

int main() {
    int k = 5;    double gradePoints[k], credits[k];
    double totalGradePoints = 0.0, totalCredits = 0.0, spi;

```

```

for (int a = 0; a < k; a++) {
    printf("Enter grade points  %d: ", i + 1);
    scanf("%lf", &gradePoints[i]);
    printf("Enter credits %d: ", i + 1);
    scanf("%lf", &credits[i]);
    totalGradePoints += gradePoints[i];
    totalCredits += credits[i];
}
spi = totalGradePoints / totalCredits;
printf("SPI (Semester Performance Index): %.2lf\n", spi);
return 0;
}

```

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

Ans: #include <stdio.h>

```

int main()
{
    int f,wl,c;
    printf("enter wavelength ");
    scanf("%d",&wl);
    printf("enter speed");
    scanf("%d",&c);
    f=(c/wl);
    printf("the frequency is:%d",f);
    return 0;
}

```

Q 16. A 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: $v^2 = u^2 + 2as$]

Ans: #include <stdio.h>


```
#include <math.h>
```

```
int main() {  
    double u,a,s,v;  
    u=30.0;  
    a=5.0;  
    s=70.0  
    v=sqrt(u * u + 2 * a * s);  
    printf("The final velocity of the car is %.2lf", v);  
    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) $s = ut + \frac{1}{2}at^2$]

Ans: #include <stdio.h>

```
int main() {  
    double u,a,t,v,s;  
    u=0.0;  
    a=4.0;  
    t=3.0;  
    v = u + (a * t);  
    s = (u * t) + (0.5 * a * t * t);  
    printf("(a) The final velocity of the horse is %.2lf m/s\n", v);  
    printf("(b) The distance traveled by the horse is %.2lf meters\n", s);  
    return 0;  
}
```

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

Ans: #include <stdio.h>

```
int main(){
```

```

long int university_roll;
int sum,last_digit;
scanf("%ld", &university_roll);
for(int index = 0; index < 4; index++){
last_digit = university_roll % 10;
university_roll = university_roll / 10;
sum += last_digit;
}
printf("%d",sum);
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 = 2.20462pound.

Ans:#include <stdio.h>

```

int main()
double height_cm,weight_kg,cm_to_inch,kg_to_pound;
height_cm=175.0;
weight_kg=70.0;
cm_to_inch=0.393701;
kg_to_pound=2.20462;
double height_feet= height_cm * cm_to_inch / 12.0;
double weight_pounds= weight_kg * kg_to_pound;
printf("Height in centimeters: %.2lf cm\n", height_cm);
printf("Height in feet: %.2lf feet\n",height_feet);
printf("Weight in kilograms: %.2lf kg\n",weight_kg);
printf("Weight in pounds: %.2lf pounds\n",weight_pounds);
return 0;
}

```

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

- a. A character variable named option.
- b. An integer variable sum initialized to 0
- c. A floating point variable, product, initialized to 1.

Ans: a. char option;

b. int sum = 0;

c. 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.

Ans: #include <stdio.h>

int main()

```
{
    int numbers[9];
    printf("Enter nine integers:\n");
    for (int z = 0; z < 9; z++)
    {
        scanf("%d", &numbers[z]);
    }
    printf("group of three numbers separated by commas:\n");
    for (int z = 0; z < 9; z++)
    {
        printf("%d", numbers[z]);
        if ((z + 1) % 3 == 0)
        {
            printf("\n");
        } else
        {
            printf(",");
        }
    }
    return 0;
}
```

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

Ans: Header file is a text file that contains pieces of code written in the C programming language.

Header files in C language are used to declare functions, macros, and data types that are used in a C program. They provide a way to share code between multiple C files, allowing programmers to write modular and reusable code.

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 function are pre-defined functions provided by programming languages or libraries to perform common and useful operations.

The four common libraries are-

1. printf()
2. scanf()
3. sqrt()
4. strlen(_

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. C is placement oriented LanguageHi30 36 1e

Q27. What is the meaning of following statement?

```
printf("%d",scanf("%d%d",&a,&b));
```

Ans: The meaning of the following statement is firstly the prompt will wait for the user to input the values of a and b and thereafter it will print the number of input variables passed in it, i.e in this case 2 (Reason : scanf returns integer value of number of inputs passed and assigned successfully.)

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.

Ans:

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

```
int main(){
```

```
    float m;
```

```
int time=4;
```

```
    scanf("%f",&m);
```

```
    printf("%.2f", m/time);
```

```
    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.

Ans: #include <stdio.h>

```
int main()
{
    float satyam=50,suman=70,shyam=80;
    float avg;
    avg=((satyam+suman+shyam)/3);
    printf("the average marks of these three participants is :%f",avg);
}
```

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.

Ans: #include <stdio.h>

```
Int main()
{
    Int x,y,z;
    printf("money given to saurav ");
    scanf("%d",&x);
    printf("money given to shyam ");
    scanf("%d",&y);
    z=x;
    x=y;
    y=z;
}
```

```

printf("money which he want to give saurav : %d",x);
printf("\nmoney which he want to give shyam : %d",y);
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.

Ans:#include <stdio.h>

```

int main() {
    float speed_kph = 4.0;
    float time_min = 3.0;
    float time_hr = time_min / 60.0;
    float distance_km = speed_kph * time_hr;
    printf("Distance travelled %.2f kilometers\n", distance_km);
    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, you can combine multiple escape sequence in a single line of program code in a languages like c and c++. Escape sequences are used to present special characters or control codes within a string literal.

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

Ans: Comments increases the code readability.It does not compiled by a compiler.

In single line comments we use “//” in starting of line.

In multi line comments,we use “ /* ” in starting and “*/”ending of line.

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

Ans: In this program,ampercent(&) is missing means address is not provide to the variable .

Q36. What will be the output?

```
#include <stdio.h>
int main()
{
    if (sizeof(int) > -1)
        printf("Yes");
    else
        printf("No");
    return 0;
}
```

Ans: output=No

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

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

Ans:gross- salary INTEREST,salary of emp,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.

Ans:#include <stdio.h>

```
int main() {
    double tank_capacity = 175.0;
    double drainage_rate = 25.0;
    double time_hours = tank_capacity / drainage_rate;
    int hours = (int)time_hours;
```



```

    int minutes = (int)((time_hours - hours) * 60);
    printf("Time required to completely clean the tank: %d hours and
%d minutes\n", hours, minutes);
    return 0;
}

```

Q39. The percent y (in decimal form) of battery power remaining x hours after you turn on a laptop computer is $y = -0.2x + 1$.

Develop a 'C' program to calculate after how many hours the battery power is at 75%?

Ans: #include<stdio.h>

```

int main() {
    float y = 0.75;
    float x = (1 - y) / 0.2;
    printf("Battery Will Reach 75%% After %f hours", x); // x = -(y - 1) /
0.2 => x = (1 - y) / 0.2
    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: a. compiler

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

- a. %0 b. %d
- c. %o d. %e

Ans: c. %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: b.%.2e

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

- a. char
b. array
c. float
d. Int

Ans:b.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: c."hell"8

Q 45. What is the output of following code?

```
#include<stdio.h>
void main()
{
    int b,c=5 ;
    printf("%d , %d", b,c);
}
```

- a. 5, 5 b. 5, 5.000000

c. Garbage, 5.000000 d. Garbage,5

Ans: d.Garbage,5

Q46. Which of the following is an identifier?

a. &fact b. Basic_pay c. enum d. 1sum

Ans:b. Basic_pay

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: a.c1

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

a. $(365.55)_{10} = (?)_2$

b. $(453.65)_{10} = (?)_8$

c. $(5164.12)_{10} = (?)_{16}$

d. $(23.65)_{10} = (?)_5$

e. $(772)_{10} = (?)_7$

Ans: a. $(365.55)_{10} = (101101101.011)_2$ (Binary)

b. $(453.65)_{10} = (750.16)_8$ (octal)

c. $(5164.12)_{10} = (220C.E7)_{16}$ (Hexadecimal)

d. $(23.65)_{10} = (43.131)_5$ (Base5)

e. $(772)_{10} = 2152$ (Base 7)

Q49. Covert the following numbers to decimal number system-

- a. $(325.54)_6 = (?)_{10}$
- b. $(1001010110101.1110101)_2 = (?)_{10}$
- c. $(742.72)_8 = (?)_{10}$
- d. $(AC94.C5)_{16} = (?)_{10}$

Ans. a. $(325.54)_6 = 125.9444\dots$ in decimal (approximately)
 b. $(1001010110101.1110101)_2 = 8193.9990234375$ in decimal.
 c. $(742.72)_8 = 482.125$ in decimal.
 d. $(AC94.C5)_{16} = 44280.9453125$ in decimal.

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

$$(DB56.CD4)_{16} = (?)_2, (?)_8, (?)_4$$

Ans. $(DB56.CD4)_{16}$ is equivalent to:
 $(1101101101101100011011000100)_2$ in binary.
 (666665148) in octal.
 2366660 in decimal.

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

$$(473.42)_8 = (?)_2, (?)_{10}, (?)_{16}, (?)_5$$

Ans. $(473.42)_8$ is equivalent to:
 $(100111011.100010)_2$ in binary.
 123.202 in decimal.
 $7B.34$ in hexadecimal
 443.012 in base-5

Q52. Find the value of A?

- a. $(23)_{10} = (17)_A$
- b. $(21)_{16} = (41)_A$
- c. $(32)_8 = (101)_A$

Ans. a. $A=4$

b. A=8

c. A=6.77

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

```
void main(){  
int a=32770;  
printf("%d",a);  
}
```

Ans:32770

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 37.00