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.

Answer.

```c
#include<stdio.h>
#include<conio.h>
int main()
{
float p,r,s,tax;
printf("enter the rate of tax and prize");
scanf("%d,%d",&r,&tax);
s=r/100*p;
t=p+s;
printf("prize of product including tax %d",t);
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.

Answer.

```c
#include <stdio.h>
int main()
{
   float hourlyWage, hoursWorked, weeklyWages;

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

   printf("Enter the number of hours worked: ");
   scanf("%f", &hoursWorked);

   if (hoursWorked <= 30) {
      weeklyWages = hourlyWage * hoursWorked;
   } else {
      float regularHours = 30;
      float extraHours = hoursWorked - regularHours;

      weeklyWages = (hourlyWage * regularHours) + (2 * hourlyWage * extraHours);
   }

   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.

Answer.

```
#include<stdio.h>
Int main()
{
int n=500,a=2,m=15,p=25,t=10,x;
x= n-(a*50)+(m*35)+(p*10)+(t*15);
printf("%d",x);
return 0;
}
```

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

Answer.

```
#include<stdio.h>
int main()
{
printf("Sachin");
printf("/n 22-06-2005");
printf("/n 9983455438");
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.

Answer.

```
#include<stdio.h>
Int main() {
int a;
float b;
char c;
printf ("enter 1 no,1 float,1 character");
scanf("%d%f%c",&a,&b,&c);
printf("%d",a
printf("\n%f",b);
printf("\n%c",c);
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

Answer.

```c
#include<stdio.h>
Int main()
{
float cost=172.53;
printf("the sales total is : %$ %f",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.
Answer.
```c
#include <stdio.h>

int main() {
    int applesPerPerson = 6; // Raju got 6 apples from each person
    int numberOfPeople = 3;  // Raju received apples from 3 people
    int totalApples = applesPerPerson * numberOfPeople;

    printf("Raju has a total of %d apples without adding them.\n", totalApples);

    return 0;
}
```

Q8.Write a program that prints the floating point value in exponential format correct to two decimal places.
Answer.
```c
#include<stdio.h>
int main()
{
float a;
scanf("%f",&a);
printf("%.2f",a);
return 0;
}
```

Q9.Write a program to input and print your mobile number (i.e. of 10 digits).
Answer.
```c
#include<stdio.h>
int main()
{
long a;
printf("enter the mobile no");
scanf("%d",&a);
printf("%d",a);
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)

Answer.

```c
#include <stdio.h>
int main() {
    int initialPopulation = 30000;
    float firstYearIncrease = 0.20;
    float secondYearIncrease = 0.30;

    int populationAfterFirstYear = initialPopulation + (initialPopulation * firstYearIncrease);

    int populationAfterSecondYear = populationAfterFirstYear + (populationAfterFirstYear * secondYearIncrease);

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

    return 0;
}
```

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

Answer.

```c
#include<stdio.h>
int main()
{
Char a;
scanf("enter a character %c",a);
printf("ASCII value %d",a);
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.

Answer.

```c
#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);
```

```c
    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.
Answer.

```c
#include<stdio.h>
#include<conio.h>
int main()
{
float xp,yp,xq,yq,slope,aoi;
printf("enter the corrdinates of P and Q");
scanf("%f,%f,%f,%f",&xp,&yp,&xq,&yq);
slope=(yp-yq)/(xp-xq);
aoi= (tan)^(-1)slope;
printf("slope=%f,angle of incident=%f",slope,aoi);
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:

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

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.
Answer.

```c
#include<stdio.h>
#include<conio.h>
int main()
{
float g1,g2,g3,g4,g5,c1,c2,c3,c4,c5,spi;

printf("enter the grade of 5 sub");
scanf("%f,%f,%f,%f,%f",&g1,&g2,&g3,&g4,&g5);

printf("enter the credit of sub");
scanf("%f,%f,%f,%f,%f",&c1,&c2,&c3,&c4,&c5);

spi=((c1*g1)+(c2*g2)+(c3*g3)+(c4*g4)+(c5*g5))/(c1+c2+c3+c4+c5);
printf("SPI of 5 sub%f",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=λ*f.

Answer.

```
#include<stdio.h>
#include<conio.h>
int main()
{
float c,f,wl;
printf("enter the wavelength and speed");
scanf("%f,%f",&c,&wl);
f=c/wl;
printf("frequency %f",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: v2 = u2 + 2as]

Answer.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int main()
{
int u=30,a=5,s=70,i;
float v;
i=pow(u,2)+2*a*s;
v= pow(i,(½))
printf(" final velocity=%f",v2);
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]

Answer.

```
#include<stdio.h>
#include<conio.h>
#include<math.h>
int main()
{
int a=4,u=0,t=3,v,i;
float s;
v=u+a*t;
i= pow(t,2);
s=u*t+0.5*a*i;
printf("%d,%f",v,s);
return 0;
}
```

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

Answer.
```c
#include<stdio.h>
#include<conio.h>
int main()
{
int n=07050031,s=0,r;
for(int i=1;i<=4;i++)
{  r=n%10;
   s=s+r;
   n=n/10;
}
Printf("%d",s);
}
```

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

Answer.
```c
#include<stdio.h>
#include<conio.h>
int main()
{
float h,w,hf,wp;
printf("height in cm and weight in kgs);
scanf("%f,%f",&h,&w");
hf=0.3937*h;
wp=2.2046*w;
printf("weight in pound=%f,height in feet=%f",wp,hf);
return 0;
}
```

Q 20 . Code the variable declarations for each of following:
A character variable named option.
An integer variable sum initialized to 0
A floating point variable, product, initialized to 1

Answer.
```c
Char option;
Int sum=0;
Float product=1;
```

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

Answer.

```c
#include <stdio.h>
int main()
{
   int numbers[9];

   printf("Enter nine integers:\n");
   for (int i = 0; i < 9; i++) {
      scanf("%d", &numbers[i]);
   }

   for (int i = 0; i < 9; i++) {
      printf("%d", numbers[i]);

      if ((i + 1) % 3 != 0) {
         printf(", ");
      } else {
         printf("\n");
      }
   }

   return 0;
}
```

Q22. What are header files and what are its uses in C programming?
Answer.
In C language, header files contain a set of predefined standard library functions. The .h is the extension of the header files in C and we request to use a header file in our program by including it with the C preprocessing directive "#include".
And it can make easier to program in c language.

Q23. What will be the output of following program?
```c
#include<stdio.h>
int main()
{   int num=070;
printf("%d\t%o\t%x",num,num,num);
}
```
Answer.
50 70 38

Q 24. What will be the output of following program?
```c
#include <stdio.h>
void main()
{
int x = printf("GLA UNIVERSITY");
      printf("%d", x);
      }
```
Answer.

Output- GLA UNIVERSITY14

Q25. What are library functions? List any four library functions.
Answer.
Library functions in C language are inbuilt functions which are grouped together and placed in a common place called library.Each library function in C performs specific operation.
Four library functions are:
1.stdio.h
2.conio.h
3.math.h

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);

    }

Answer.
C is placement oriented languageHi324020

Q27. What is the meaning of following statement?
printf("%d",scanf("%d%d",&a,&b));
Answer.
The statement is a bit unconventional and not recommended.

Q28. What will be the output of following program?
#include <stdio.h>
void main()

{

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

}
Answer.
" 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.
Answer.
#include <stdio.h>

int main() {
   float distance, time, speed;

```
    printf("Enter the distance between GLA University and Delhi (in km): ");
    scanf("%f", &distance);

    time = 4.0;

    speed = distance / time;

    printf("The speed of the bus is %.2f km/h.\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.

Answer.

```
#include <stdio.h>

int main() {
    int satyamMarks = 50;
    int sumanMarks = 70;
    int shyamMarks = 80;
    float averageMarks;

    averageMarks = (satyamMarks + sumanMarks + shyamMarks) / 3.0;

    printf("Average marks: %.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.

Answer.

```
#include <stdio.h>
int main()
{
    double sauravMoney, sajalMoney, temp;

    printf("Enter the money given to Saurav: ");
    scanf("%lf", &sauravMoney);

    printf("Enter the money given to Sajal: ");
    scanf("%lf", &sajalMoney);

    temp = sauravMoney;
    sauravMoney = sajalMoney;
    sajalMoney = temp;
```

```
    printf("After rectifying the mistake:\n");
    printf("Money given to Saurav: %.2lf\n", sauravMoney);
    printf("Money 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.

Answer.
```
include<studio.h>
int main()
{
int min,kmh;
int meter;
min= 3;
kmh = 4;
meter= (kmh*1000*min)/60;
printf("distance travelled is %d metre",meter);
return 0;
}
```

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

Answer.
Yes two or more escape sequences such as \n and \t can be used in a single line of code in c programming.

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

Answer.
Comments are extra information about the code for the programmer. It is not supposed to run during execution of the program.
There are two types of comments:
1) Single line comment.
2) Multiline comment.

Single line comment:
- In this type of comment we comment a single line of code.
- We use // in starting of the line we want to comment.
- Example:
  // printf("hello class");

Multi line comment:
- In this type of comment we comment more than one line of code
- We use /*in starting of portion we want to comment and */ at last of the portion.
- Example:
  /*int a,b;
```

```
    a= 20;
    b= a*6;
    printf("b is %d",b);*/
```

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

Answer.

In this statement there is no & sign before variable number due to which value entered by user cannot be assigned to the variable number.

The correct syntax should be like:

scanf("%d",&number);

Q36. What will be the output?

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

Answer.

The output will be "Yes" because we know that sizeof function gives size of the data type so here size of int can be 2 or 4 which is greater than -1 so condition of if statement is satisfied and it would enter the block of if statement and then it will print Yes.

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

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

Answer.

- gross-salary: It contains hyphen which is not allowed in variable name of c.
- salary of emp: It contains spaces which is not considerable in variable name of c.
- avg.: It contains . Which cannot be used in variable name

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.

Answer.

```c
#include <stdio.h>

int main() {
    const int tankCapacity = 175;
    const int drainRate = 25;

    float timeRequired = (float)tankCapacity / drainRate;

    printf("Time required to completely clean the tank: %.2f hours\n", timeRequired);

    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%?

Answer.

```c
#include <stdio.h>

int main() {
    float batteryPower = 0.75;
    float hours;

    hours = (1 - batteryPower) / (-0.2);

    printf("The battery power will be 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

Answer.

Option (a). Compiler

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

a.%0   b.%d

c. %o   d. %e

Answer.

Option (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

Answer.

Option (b). %.2f

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

a. char

b. array

c. float

d. int

Answer.

Option (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

Answer.

Option (c) "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

Answer.

Option (d). Garbage,5

Q46. Which of the following is an identifier?

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

Answer.

 Option (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

Answer.

Option (a). c1

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

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

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

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

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

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

Answer.

a) 101101101.10001100110011001101

(b) 705.51463146314631463146

(c) 142C.1EB851EB851EB851EB85

(d) 43.31111111111111111111

(e) 2152

Q49. Covert the following numbers to decimal number system-

$(325.54)_6 = (?)_{10}$

$(1001010110101.1110101)_2 = (?)_{10}$

$(742.72)_8 = (?)_{10}$

$(AC94.C5)_{16} = (?)_{10}$

Answer.

    (a) 125.944

    (b) 4789.9140625

    (c) 482.90625

.   (d) 44180.76953125

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

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

Answer.
- $(1101101101010110.110011010100)_2$ in binary
- $(3365131.314)_8$ in octal
- $(3223.3034)_4$ in quaternary

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

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

Answer.
- $(1001110011.100010)_2$ in binary
- 5634_{10} in decimal
- $(9CD.82)_{16}$ in hexadecimal
- $(4104)_5$ in quintal

Q52. Find the value of A?

$(23)_{10} = (17)_A$
$(21)_{16} = (41)_A$
$(32)_8 = (101)_A$

Answer.
- **$(23)10 = (17)A$**

Answer: 101+100 = 20+3 = (23)10 =(23)A , SO A = 10
- **$(21)16 = (41)A$**

Answer: 161+160 = 32+1 = (33)10 =(33)A , SO A = 10
- **$(32)8 = (101)A$**

Answer: 81+80 =24+2 = (26)10 =(26)A ,SO A = 10

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

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

Answer.
```
#include<stdio.h>
int main ()
{
        int a=32770;
printf("%d",a);
return 0;
}
```
output:- 32770

Q54:
```c
#include <stdio.h>
int main()
{
float c = 5.0;
printf ("Temperature in Fahrenheit is %.2f", (9/5)*c + 32);
return 0;
}
```
Answer.
Temperature in Fahrenheit is 41.00