

## **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>
```

```
#include <conio.h>
```

```
int main() {
```

```
    float originalPrice, taxRate, totalAmount;
```

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

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

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

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

```
    totalAmount = originalPrice + (originalPrice * (taxRate / 100));
```

```
    printf("The total Amount is: %.2f", totalAmount);
```

```
    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>

#include<conio.h>

#include<math.h>

int main()
{
    float m,h,w,k;

    printf("eneter Money given to employee per hour");
    scanf("%f",&m);
    printf("eneter total hours employee work ");
    scanf("%f",&h);

    if(h<=30)
    {
        w=h*m;
        printf("wages is : %.2f",w);
    }

    else if(h>30)
    {
        k=h-30;
        w=(30*m)+(k*(m+m));
        printf("wages is : %.2f",w);
    }
    else
    {
        printf("enter correct values");
    }

    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>

#include<conio.h>

#include<math.h>

int main()
{
    float amount;

    amount = 500-((2*50)+(1.5*35.0)+(2.5*10)+(1*15));

    printf("amount is : %.2f",amount);

    return 0;

}
```

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

```
#include <stdio.h>

#include<conio.h>

int main() {

    printf("Name:Piyush Kumar");

    printf("\nDate of Birth: 17:02:2006");

    printf("\nMobile Number:8686765674");

    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>
```

```
#include <conio.h>
```

```
int main() {
```

```
    int integerNumber;
```

```
    char character;
```

```
    float floatNumber;
```

```
    printf("Enter an integer: ");
```

```
    scanf("%d", &integerNumber);
```

```
    printf("Enter a character: ");
```

```
    scanf(" %c", &character);
```

```
    printf("Enter a float: ");
```

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

```
    printf("Integer is: %d", integerNumber);
```

```
    printf("\nCharacter is : %c", character);
```

```
    printf("\nFloat: %.2f", floatNumber);
```

```
    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

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

```
int main()
{
    int a;
    a = 6.5 * 3;
    printf("total apples : ", a);
}
```

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

```
int main() {
    double value;

    printf("Enter a floating-point value: ");
    scanf("%lf", &value);

    printf("Value in exponential format with two decimal places: %.2e\n", value);

    return 0;
}
```

```
}
```

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

```
int main() {  
  
    int m;  
  
    printf("enter mobile number : ");  
  
    scanf("%d",&m);  
  
    printf("%d",m);  
  
  
    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)

```
int main()  
{  
  
    int a=3000,b,c;  
  
    b=3000*(20/100)+3000;  
  
    c=3000*(30/100)+b;  
  
    printf("Population after 2 years : ",c);  
  
  
    return 0;  
  
}
```

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

```
#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;
```

```
}
```

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>
```

```
#include <conio.h>
```

```
int main() {
```

```
float basicPay, hra, ta, totalSalary;
```

```
printf("Enter the basic pay of the employee: ");
```

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

```
hra = 0.15 * basicPay;
```

```
ta = 0.20 * basicPay;
```

```
totalSalary = basicPay + hra + ta;
```

```
printf("Total salary of the employee is: %.2f\n", totalSalary);
```

```
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.

```
int main()
{
    int x,y,a,b,s;
    printf("enter first coordinates ");
    scanf("%d%d",x,y);
    printf("enter second coordinates ");
    scanf("%d%d",a,b);
    s=(a-x)/(b-y)
    printf("slope is %d",s);

    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:  $k \text{ SPI} = \sum_{i=1}^k c_i g_i$   $\sum_{i=1}^k c_i$  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.

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

```
#include<conio.h>
```

```
int main() {
    int k = 5;
    float grades[] = {4.0, 3.5, 3.0, 2.5, 4.0};
    int credits[] = {3, 4, 3, 2, 3};

    float spi = 0.0;

    for (int i = 0; i < k; i++) {
        spi += (grades[i] * credits[i]);
```



```
}
```

```
int totalCredits = 0;
```

```
for (int i = 0; i < k; i++) {
```

```
    totalCredits += credits[i];
```

```
}
```

```
spi /= totalCredits;
```

```
printf("SPI for k = %d is: %.2f\n", k, spi);
```

```
return 0;
```

```
}
```

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

```
int main()
```

```
{
```

```
    float w,c,f;
```

```
    printf("enter frequency and wavelength : ");
```

```
    scanf("%f%f",&w,&c);
```

```
    f=c/w;
```

```
    printf("%f",f);
```

```
    return 0;
```

```
}
```

Q 16. A car travelling at 30 m/s accelerates steadily at 5 m/s<sup>2</sup> for a distance of 70 m. What is the final velocity of the car? [Hint:  $v^2 = u^2 + 2as$ ]

```
int main()
```

```
{
```

```

float u,a,s,v;

printf("enter intial velocity");

scanf("%f",&u);

printf("enter acceleration");

scanf("%f",&a);

printf("enter distance");

scanf("%f",&s);

v=sqrt((u*u)+2*a*s)

printf("final velocity %f",&v);

return 0;

}

```

Q 17.A horse accelerates steadily from rest at 4 m/s<sup>2</sup> for 3s. (a) What is its final velocity? (b) How far has it travelled? [Hint: (a)  $v = u + at$  (b)  $s = ut + \frac{1}{2}at^2$  ]

```

int main()

{

float a,s,t,v;

printf("enter acceleration");

scanf("%f",&a);

printf("enter time ");

scanf("%f",&t);

v=a*t;

s=1/2*a*t*t;

printf("final velocity %f",v);

printf("distance is %f",s);

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 feet and pounds respectively. Note :- 1 cm = 0.393701inch , 1 Kg = 2.20462

```
int main()
{
    float h,w,F,p;
    printf("enter height in centimeter ");
    scanf("%f",&h);
    printf("enter weight in kilogram ");
    scanf("%f",&w);
    F=h*0.032808399;
    p=w*2.2046;
    printf("%.2f",F);
    printf("\n%.2f",p);

    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

- 1) char option;
- 2) int sum = 0;
- 3) 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>
```

```
#include<conio.h>
```

```
int main()
```

```
{
```

```

int a,b,c,d,e,f,g,h,i;

printf("enter number of nine digits ");

scanf("%d%d%d%d%d%d%d%d%d",&a,&b,&c,&d,&e,&f,&g,&h,&i);

printf("%d,%d,%d",a,b,c);

printf("\n%d,%d,%d",d,e,f);

printf("\n%d,%d,%d",g,h,i);

return 0;

}

```

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

Header files are simply files in which you can declare your own functions that you can use in your main program or these can be used while writing large C programs..NOTE: Header files generally contain definitions of data types,function prototypes and c preprocessor commands.

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

```

#include <stdio.h>

#include<conio.h>

int main()
{
    int sum =0,r,n,count=0;

    n=12059978;

    while(n>0)
    {
        r=n%10;

        sum=sum+r;

        count++;

        n=n/10;

        if(count==4)
        {

```

```

        break;
    }

}

printf("%d",sum);

return 0;
}

```

Q23. What will be the output of following program? #include int main() { int num=070; printf("%d\t%o\t%x",num,num,num); }

56 70 38

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

GLA UNIVERSITY14

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

When it comes to the programming world, library functions play an important role. Library functions help the programming language to perform desirable actions.

Eg: string. h: functions for manipulating strings, such as strcpy() and strlen().

stdio. h: input/output functions, such as printf() and scanf().

math. h: mathematical functions, such as sin() and sqrt().

time. h: functions for working with dates and times, such as time() and localtime().

Q26. What will be the output of following program? #include void main() { int x = printf("C is placement oriented Language") – printf("Hi"); printf("%d %o %x", x,x,x); }

30 36 1E

Q27. What is the maning of this statement ? printf("%d",scanf("%d%d",&a,&b));

1)The scanf function waits for the user to enter two integer values separated by whitespace.

2)When the user enters values, scanf reads them and stores them in a and b.

3)After scanf has successfully read and stored the values, it returns the number of successfully converted and assigned input items, which in this case is 2.

4)Finally, the printf function takes this returned value (which is 2) and prints it as an integer using the %d format specifier.

5)So, if the user enters two integers, the output of this statement will be 2, indicating that scanf successfully read and assigned two integer values to a and b.

Q28. What will be the output of following program? #include void main() { printf(" \nC %% FOR %% PLACEMENT\"); }

"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>
```

```
#include<conio.h>
```

```
int main()
```

```
{
```

```
float m,s;
```

```
printf("enter distance between GLA University and Delhi : ");
```

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

```
s=(m/4);
```

```
printf("speed of bus %.2f ",s);
```

```
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>
```

```
#include<conio.h>
```

```
int main() {
```

```

int s=50,su=70,shy=80;

float av;

av = (s+su+shy)/3;

printf("average is : %.2f",av);


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>

#include<conio.h>


int main() {

    int a,b,c;

    printf("money given to saurav is ",a);

    scanf("%d",&a);

    printf("money given to sajal is ",b);

    scanf("%d",&b);

    c=a;

    a=b;

    b=c;

    printf("after exchanging money of saurav is : %d",a);

    printf("\nafter exchanging money of sajal is : %d",b);


    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>

#include<conio.h>

```

```
int main() {
    float s=4,t=0.05; //minute converted to hour//
    float d=(s*t);
    printf("distance covered is %.2f",d);

    return 0;
}
```

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

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

```
int main() {
    printf("distance covered is\n\t 15km");

    return 0;
}
```

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

The comments in C are human-readable explanations or notes in the source code of a C program. A comment makes the program easier to read and understand.

We can insert comments by two ways

- 1) Single line comments using `//`
- 2) Multiline comments using `/*` `*/`

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

It should be `&number` for input

Q36. What will be the output? `#include int main() { if (sizeof(int) > -1) printf("Yes"); else printf("No"); return 0; }`

No

Q37. Point out which of the following variable names are invalid: `gross-salary`, `INTEREST`, `salary of emp`, `avg.`, `thereisbookinmysoup`



- 1) gross-salary INTEREST: Due to hypens
- 2) salary of emp : Due to spaces
- 3) avg. : Contains invalid symbol (dots)

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>

#include<conio.h>

int main()
{

    float T,r,t;

    printf("enter total gallons of water : ");

    scanf("%f",&T);

    printf("enter gallon of water draining out in 1 hour : ");

    scanf("%f",&r);

    t=T/r;

    printf("total time required is %.2f hours",t);

    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%?

```
#include <stdio.h>

#include<conio.h>

int main() {

    float y,l;
```

```

printf("enter battery percentage %%");

scanf("%f",&y);

l=(y/100); //convert %percentage into decimal

float x = (1 - l) / 0.2;

printf("total remaining hours %.2f hours",x);

return 0;
}

```

Q40. Which of the following is used to convert the high level language in machine language in a single go? a. Compiler c. Linker b. Interpreter d. Assembler

Compiler

Q 41. What is the format specifier for an Octal Number? a. %0 b. %d c. %o d. %e

%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

%.2e

Q 43. Which of the following is not a basic data type? a. char b. array c. float d. int

Array

Q 44. What is the output of following code? #include void main() { int x=0; x= printf("\hello\b"); printf("%d",x); } a. hello7 b. "hello"7 c. "hell"8 d. hell8

"hello."8

Q 45. What is the output of following code? #include 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

Garbage, 5

Q46. Which of the following is an identifier? a. &fact b. Basic\_pay c. enum d. 1sum

a. &fact – It is a invalid identifier because it starts with an ampersand (&)

b. Basic\_pay - This is a valid identifier because it consists of letters and underscores

c. enum - This is a valid identifier in some programming languages, but it's a keyword in others

d. 1sum - This is not a valid identifier because it starts with a digit

Q 47. What is the output of the following program? #include void main() { char x, a='c';  
x=printf("%c",a); printf("%d",x); } a. c1 c. 1 b. cgarbage c. c

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

Convert the integer part of the decimal number to the desired base.

Convert the fractional part of the decimal number to the desired base.

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

Convert the integer part (365) to binary:

$$365 / 2 = 182 \text{ remainder } 1$$

$$182 / 2 = 91 \text{ remainder } 0$$

$$91 / 2 = 45 \text{ remainder } 1$$

$$45 / 2 = 22 \text{ remainder } 1$$

$$22 / 2 = 11 \text{ remainder } 0$$

$$11 / 2 = 5 \text{ remainder } 1$$

$$5 / 2 = 2 \text{ remainder } 1$$

$$2 / 2 = 1 \text{ remainder } 0$$

$$1 / 2 = 0 \text{ remainder } 1$$

Reading the remainders from bottom to top, the binary representation of the integer part is 101101101.

Convert the fractional part (0.55) to binary:

Multiply the fractional part by 2 repeatedly and keep the integer parts of the results:

$$0.55 * 2 = 1.10$$

$$0.10 * 2 = 0.20$$

$$0.20 * 2 = 0.40$$

$$0.40 * 2 = 0.80$$

$$0.80 * 2 = 1.60$$

Reading the integer parts of the results from left to right, the binary representation of the fractional part is 10011.

Combine the binary integer part and fractional part with a decimal point:

$$(365.55)_{10} = (101101101.10011)_2$$

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

Convert the integer part (453) to octal:

$$453 / 8 = 56 \text{ remainder } 5$$

$$56 / 8 = 7 \text{ remainder } 0$$

$$7 / 8 = 0 \text{ remainder } 7$$

Reading the remainders from bottom to top, the octal representation of the integer part is 705.

Convert the fractional part (0.65) to octal:

Multiply the fractional part by 8 repeatedly and keep the integer parts of the results:

$$0.65 * 8 = 5.20$$

$$0.20 * 8 = 1.60$$

Reading the integer parts of the results from left to right, the octal representation of the fractional part is 51.

Combine the octal integer part and fractional part:

$$(453.65)_{10} = (705.51)_8$$

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

Convert the integer part (5164) to hexadecimal:

$$5164 / 16 = 322 \text{ remainder } 12 \text{ (C in hexadecimal)}$$

$$322 / 16 = 20 \text{ remainder } 2$$

Reading the remainders from bottom to top, the hexadecimal representation of the integer part is 20C.

Convert the fractional part (0.12) to hexadecimal:

Multiply the fractional part by 16 repeatedly and keep the integer parts of the results:

$$0.12 * 16 = 1.92$$

Reading the integer parts of the results from left to right, the hexadecimal representation of the fractional part is 1A.

Combine the hexadecimal integer part and fractional part:

$$(5164.12)_{10} = (20C.1A)_{16}$$

$$d) (23.65)_{10} = (?)_5 \text{ (Base-5):}$$

Convert the integer part (23) to base-5:

$$23 / 5 = 4 \text{ remainder } 3$$

Reading the remainders from bottom to top, the base-5 representation of the integer part is 43.

Convert the fractional part (0.65) to base-5:

Multiply the fractional part by 5 repeatedly and keep the integer parts of the results:

$$0.65 * 5 = 3.25$$

$$0.25 * 5 = 1.25$$

$$0.25 * 5 = 1.25$$

Reading the integer parts of the results from left to right, the base-5 representation of the fractional part is 313.

Combine the base-5 integer part and fractional part:

$$(23.65)_{10} = (43.313)_5$$

e)  $(772)_{10} = (?)_7$  (Base-7):

Convert the decimal number 772 to base-7:

$$772 / 7 = 110 \text{ remainder } 2$$

$$110 / 7 = 15 \text{ remainder } 5$$

$$15 / 7 = 2 \text{ remainder } 1$$

$$2 / 7 = 0 \text{ remainder } 2$$

Reading the remainders from bottom to top, the base-7 representation of the integer part is 2152.

Therefore,  $(772)_{10} = (2152)_7$ .

Q49. Convert the following numbers to decimal number system- a)  $(325.54)_6 = (?)_{10}$  b)  $(1001010110101.1110101)_2 = (?)_{10}$  c)  $(742.72)_8 = (?)_{10}$  d)  $(AC94.C5)_{16} = (?)_{10}$

To convert numbers from different bases to the decimal number system, you can use the following steps:

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

To convert a base-6 number to decimal, you can use the following calculation:

$$(325.54)_6 = (3 \cdot 6^2 + 2 \cdot 6^1 + 5 \cdot 6^0 + 5 \cdot 6^{-1} + 4 \cdot 6^{-2})_{10}$$

$$= (336 + 26 + 51 + 5/6 + 4/36)_{10}$$

$$= (108 + 12 + 5 + 0.8333 + 0.1111)_{10}$$

$$= 125.9444 \text{ in decimal.}$$

So,  $(325.54)_6 = 125.9444$  in decimal.

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

To convert a binary number to decimal, you can use the following calculation:

$$\begin{aligned}(1001010110101.1110101)_2 &= (12^{12} + 02^{11} + 02^{10} + 12^9 + 02^8 + 12^7 + 02^6 + 12^5 + 12^4 + \\ &02^3 + 12^2 + 02^1 + 12^0 + 12^{(-1)} + 12^{(-2)} + 12^{(-3)} + 02^{(-4)} + 12^{(-5)})_{10} \\ &= (4096 + 0 + 0 + 512 + 0 + 128 + 0 + 32 + 16 + 0 + 4 + 0 + 1 + 0.5 + 0.25 + 0.125 + 0 + 0.03125)_{10} \\ &= 4796.90625 \text{ in decimal.}\end{aligned}$$

So,  $(1001010110101.1110101)_2 = 4796.90625$  in decimal.

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

To convert an octal number to decimal, you can use the following calculation:

$$\begin{aligned}(742.72)_8 &= (78^2 + 48^1 + 28^0 + 78^{(-1)} + 28^{(-2)})_{10} \\ &= (764 + 48 + 21 + 7/8 + 2/64)_{10} \\ &= (448 + 32 + 2 + 0.875 + 0.03125)_{10} \\ &= 482.90625 \text{ in decimal.}\end{aligned}$$

So,  $(742.72)_8 = 482.90625$  in decimal.

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

To convert a hexadecimal number to decimal, you can use the following calculation:

$$\begin{aligned}(AC94.C5)_{16} &= (A16^3 + C16^2 + 916^1 + 416^0 + C16^{(-1)} + 516^{(-2)})_{10} \\ &= (104096 + 12256 + 916 + 41 + 12/16 + 5/256)_{10} \\ &= (40960 + 3072 + 144 + 4 + 0.75 + 0.01953125)_{10} \\ &= 44281.76953125 \text{ in decimal.}\end{aligned}$$

So,  $(AC94.C5)_{16} = 44281.76953125$  in decimal.

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

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

To convert a hexadecimal number to other bases (binary, octal, and base-4), you can follow these steps:

Given hexadecimal number:  $(DB56.CD4)_{16}$

a) Convert to binary:

To convert from hexadecimal to binary, you can convert each hexadecimal digit to its equivalent 4-bit binary representation.

D = 1101

B = 1011

5 = 0101

6 = 0110

C = 1100

D = 1101

4 = 0100

Now, combine the binary representations with the binary point:

$(DB56.CD4)_{16} = (1101101101101010.110011010100)_2$

b) Convert to octal:

To convert from binary to octal, group the binary digits into sets of three from the binary point, and then convert each set to its octal equivalent.



$$(DB56.CD4)_{16} = (1101101101101010.110011010100)_2$$

Grouping in threes from the binary point:

$$(110) (110) (110) (110) (101) (0.110) (011) (010) (100)$$

Convert each group to octal:

$$(3) (3) (3) (3) (5) (0.3) (3) (2) (4)$$

Combine the octal digits:

$$(DB56.CD4)_{16} = (333350324)_8$$

c) Convert to base-4:

To convert from binary to base-4, group the binary digits into sets of two from the binary point, and then convert each set to its base-4 equivalent.

$$(DB56.CD4)_{16} = (1101101101101010.110011010100)_2$$

Grouping in twos from the binary point:

$$(11) (01) (10) (11) (01) (10) (10) (10) (10) (11) (00) (11) (01) (01) (00)$$

Convert each group to base-4:

$$(3) (1) (2) (3) (1) (2) (2) (2) (2) (3) (0) (3) (1) (1) (0)$$

Combine the base-4 digits:

$$(DB56.CD4)_{16} = (312312223031100)_4$$

So, in different bases:

$$(DB56.CD4)_{16} = (1101101101101010.110011010100)_2$$

$$(DB56.CD4)_{16} = (333350324)_8$$

$$(DB56.CD4)_{16} = (312312223031100)_4$$

Q51. Perform the following conversion from octal to other number as directed-  $(473.42)_8 = (?)_2$ ,  $(?)_{10}$ ,  $(?)_{16}$ ,  $(?)_5$

To convert an octal number to other bases (binary, decimal, hexadecimal, and base-5), you can follow these steps:

Given octal number:  $(473.42)_8$

a) Convert to binary:

To convert from octal to binary, you can convert each octal digit to its equivalent 3-bit binary representation.

$$4 = 100$$

$$7 = 111$$

$$3 = 011$$

$$4 = 100$$

Now, convert the fractional part:

$$0.4 = 00.100$$

$$0.2 = 00.010$$

Now, combine the binary representations with the binary point:

$$(473.42)_8 = (100111001.001000010)_2$$

b) Convert to decimal:

To convert from octal to decimal, you can use the following calculation:

$$\begin{aligned}(473.42)_8 &= (48^2 + 78^1 + 38^0 + 48^{-1} + 2 \cdot 8^{-2})_{10} \\ &= (256 + 56 + 3 + 0.5 + 0.25)_{10} \\ &= 315.75 \text{ in decimal.}\end{aligned}$$

c) Convert to hexadecimal:

To convert from binary to hexadecimal, first convert the octal number to binary (as done in part a), and then group the binary digits into sets of four from the binary point and convert each set to its hexadecimal equivalent.

$$(473.42)_8 = (100111001.001000010)_2$$

Grouping in fours from the binary point:

$$(1001) (1100) (1001) (0010) (0001)$$

Convert each group to hexadecimal:

$$(9) (C) (9) (2) (1)$$

Combine the hexadecimal digits:

$$(473.42)_8 = (9C921)_{16}$$

d) Convert to base-5:

To convert from octal to base-5, you can convert each octal digit to its equivalent 3-bit base-5 representation.

$$4 = 011$$

$$7 = 100$$

$$3 = 010$$

$$4 = 011$$

Now, convert the fractional part:

$$0.4 = 000.4$$

$$0.2 = 000.2$$

Now, combine the base-5 representations with the base-5 point:

$$(473.42)_8 = (011100010010.001000100)_5$$

So, in different bases:

$$(473.42)_8 = (100111001.001000010)_2$$

$$(473.42)_8 = 315.75 \text{ (decimal)}$$

$$(473.42)_8 = (9C921)_{16}$$

$$(473.42)_8 = (011100010010.001000100)_5$$

Q52. Find the value of A? a)  $(23)_{10} = (17)_A$  b)  $(21)_{16} = (41)_A$  c)  $(32)_8 = (101)_A$

**To find the value of A in each given equation, we need to determine the base A such that the expressions on both sides of the equation are equal. Let's solve for A in each equation:**

**a)  $(23)_{10} = (17)_A$**

**In base A, the equation can be written as:**

$$2A + 3 = 1A + 7$$

Now, let's solve for A:

$$2A + 3 = A + 7$$

$$2A - A = 7 - 3$$

$$A = 4$$

So,  $(23)_{10} = (17)_4$  in base A.

$$\text{b) } (21)_{16} = (41)_A$$

In base A, the equation can be written as:

$$216^1 + 116^0 = 41A^1 + 11A^0$$

Now, let's solve for A:

$$32 + 1 = 4A + 1$$

$$33 = 4A + 1$$

$$4A = 32$$

$$A = 8$$

So,  $(21)_{16} = (41)_8$  in base A.

$$\text{c) } (32)_8 = (101)_A$$

In base A, the equation can be written as:

$$38^1 + 28^0 = 1A^2 + 0A^1 + 1A^0$$

Now, let's solve for A:

$$24 + 2 = A^2 + A^0$$

$$26 = A^2 + 1$$

$$A^2 = 25 \text{ (in base 10)}$$

A could be 5 or -5 in base 10. However, in many contexts, we consider only positive values for bases, so we'll take  $A = 5$ .

So,  $(32)_8 = (101)_5$  in base A.

Summary of A values for each equation:

a)  $A = 4$

b)  $A = 8$

c)  $A = 5$

Q53: What will be the output of following program? Assume integer is of 2 bytes  
`void main(){ int a=32770; printf("%d",a); }`

32770

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

Temperature in Fahrenheit is 37.00