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```c
// 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 getPriceWithTax(float basePrice,float rateOfTax){
    float priceWithTax;
    priceWithTax = basePrice+(rateOfTax*basePrice/100);
    printf("The price of the product with tax is %0.2f",priceWithTax);
};

int main(){
    float basePrice,rateOfTax;
    printf("please enter the Base Price of the product\n");
    scanf("%f",&basePrice);
    printf("please enter the rate of sale-tax\n");
    scanf("%f",&rateOfTax);
    getPriceWithTax(basePrice,rateOfTax);
    return 0;
}

//for input 500 10 // output : The price of the product with tax is 550.00
```

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```c
//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 getWeeklyWages(int hours , int wagesPerHour){
    int weeklyWages = hours*wagesPerHour;
    if(hours>30){
        weeklyWages = weeklyWages + (hours-30)*wagesPerHour;// where the rate of wages/hour is doubled for hours above 30 per week.
    }
    printf("The weekly wages of an employee is %d ",weeklyWages);
}

int main(){
    int hours , wagesPerHour;
    printf("please enter the number of hours he/she has worked for the week\n");
    scanf("%d",&hours);
    printf("please enter the wages per hour\n");
    scanf("%d",&wagesPerHour);
    getWeeklyWages(hours,wagesPerHour);
    return 0;
}

// for input 32 500 // output : The weekly wages of an employee is 17000
```

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```
// 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 totalAmountHaveX = 500 ;
    float QuantityOfApple = 2.0;
    float rateOfApple = 50.0;
    float QuantityOfMango = 1.5;
    float RateOfMango = 35.0;
    float QuantityOfPotato = 2.5;
    float RateOfPotato = 10.0;
    float QuantityOfTomato = 1.0;
    float RateOfTomato = 15.0;

    float totalAmountRequiredToPurchase = (QuantityOfApple*rateOfApple) +
(QuantityOfMango*RateOfMango)+(QuantityOfPotato*RateOfPotato)+(QuantityOfTomato*R
ateOfTomato);

    float returnedAmount = totalAmountHaveX - totalAmountRequiredToPurchase;
    printf("The amount shopkeeper return to X is %0.2f", returnedAmount);
    return 0;
}

// output: The amount shopkeeper return to X is 307.50
```

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```c
//Q.4 Write a C program to print your name, date of birth and mobile number in 3 different lines.

#include <stdio.h>

int main(){
    printf("My name is Kishor Savani.\n");
    printf("My date of birth is 25/03/1988.\n");
    printf("My mobile number is 9879359185.");
    return 0;
}

// output : My name is Kishor Savani.
//          My date of birth is 25/03/1988.
//          My mobile number is 9879359185.
```

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```c
//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 integer;
    float floatValue;
    char character;

    printf("please enter integer: ");
    scanf("%d",&integer);

    printf("please enter float value: ");
    scanf("%f",&floatValue);

    while (getchar() != '\n'); // runs until buffer is cleared.

    printf("please enter character : ");
    scanf("%c",&character);

    printf("The integer you have entered is %d\n", integer);
    printf("The float you have entered is  %f\n", floatValue);
    printf("The character you have entered is %c\n", character);
}

// for input 5 5.5 c // output : The integer you have entered is 5
//                              The float you have entered is  5.500000
//                              he character you have entered is c
```

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```c
/*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 : $ %0.2f", cost);
    return 0;
}

//output : The sales total is : $ 172.53



//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 apples_having_each = 6.5;

    float total_apples = apples_having_each * 3;

    printf("Raju has total %0.1f apples." , total_apples);

    return 0;
}

// output : Raju has total 19.5 apples.
```

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

#include<stdio.h>

int main(){
    float pi = 3.14159265359;
    printf("The value of pi is %0.2e\n", pi);
    return 0;
}

//output : The value of pi is 3.14e+00



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

#include<stdio.h>

int main(){;
    long int mobileNumber;
    printf("please enter your mobile number(up to 10 digit) : ");
    scanf("%lld",&mobileNumber);
    printf("Your mobile number is : %lld\n", mobileNumber);

    return 0;
}

// output : Your mobile number is : 9879359185
```

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```c
//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(){
    float initial_population = 30000;
    float population_after_f_y = initial_population + (initial_population * 20/100);
    float population_after_s_y = population_after_f_y + (population_after_f_y * 30/100);
    printf("Population after two years: %0.0f\n", population_after_s_y);
    return 0;
}

//output : Population after two years: 46800



//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);
    printf("The ASCII value of %c is %d\n", ch, ch);
    return 0;
}

//output : The ASCII value of A is 65
```

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```c
//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<math.h>

int main(){
    float basic_pay;
    printf("Enter your basic pay: ");
    scanf("%f",&basic_pay);
    float hra = roundf(basic_pay * 15/100);
    float ta = roundf(basic_pay * 20/100);
    float salary = basic_pay + hra + ta;
    printf("The salary is %0.0f", salary);
    return 0;
}

//output : The salary is 13500
```

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```c
//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>
#define PI 3.14159265358979323846

int main(){
    double xp,yp,xq,yq;
    printf("please enter the value of xp: ");
    scanf("%lf",&xp);
    printf("please enter the value of yp: ");
    scanf("%lf",&yp);
    printf("please enter the value of xq: ");
    scanf("%lf",&xq);
    printf("please enter the value of yq: ");
    scanf("%lf",&yq);

    double slope = (yq-yp)/(xq-xp);
    printf("the slope is %lf ",slope);

    double inclination = atan(slope) * 180.0 /PI;
    printf("Theinclination is %lf degrees\n", inclination);
    return 0;
}

//for input 2 4 3 6
//output is :
//The slope is 2.000000
//The inclination is 63.434949 degrees
```

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```
//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=(∑_(i=1)^k▒〖c_i
g_i 〗 )/(∑_(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.
```

```c
#include <stdio.h>

int main(){
    int k = 5;
    double awarded_grade;
    double credit;
    double sum_awarded_grades_points = 0;
    double total_credits = 0;
    double spi;


    for(int i =0 ; i < k ; i++){
        printf("enter the grade you have got in %dth subject: ", i+1);
        scanf("%lf", &awarded_grade);
        printf("enter the credit of %dth subject: ", i+1);
        scanf("%lf", &credit);
        sum_awarded_grades_points += awarded_grade*credit;
        total_credits += credit;
    }

    spi = sum_awarded_grades_points / total_credits;

    printf("Your spi is %0.2lf", spi);

    return 0;
}
```

```
// for input 7.8 5 5.2 3 8.3 6 4.1 4 6.8 2 , output is : Your spi is 6.72
```

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```c
// 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 f, w, c;

    printf("Enter the wavelength : ");
    scanf("%lf",&w);
    printf("Enter the speed : ");
    scanf("%lf",&c);

    f = c/w;
    printf("frequency is : %lf",f);

    return 0;
}

// for input 7.2 1.2, output is 0.166667



// 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]

#include <stdio.h>
#include <math.h>

int main(){
    double initial_velocity = 5.0;
    double acceleration = 30.0;
    double distance_travelled = 70.0;
    double final_velocity;

    final_velocity = sqrt(initial_velocity*initial_velocity +
2*acceleration*distance_travelled);
    printf("The final velocity is %lf\n", final_velocity);

    return 0;
}

//output : The final velocity is 65.000000
```

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

int main(){
    double initial_velocity = 0.0;
    double acceleration = 4.0;
    double time = 3;
    double final_velocity;
    double distance_travelled;

    final_velocity = initial_velocity + acceleration * time;
    printf("final_velocity = %lf\n", final_velocity);

    distance_travelled = initial_velocity * time + 0.5 * acceleration * time * time;
    printf("distance_travelled = %lf\n", distance_travelled);

    return 0;
}

// output : final_velocity = 12.000000
//          distance_travelled = 18.000000
```

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

#include <stdio.h>

int main() {
    long int university_roll_number = 44115366;
    int sum = 0;

    for (int i = 0; i < 4; i++) {
        sum = sum + university_roll_number % 10;
        university_roll_number = university_roll_number / 10;
    }
    printf("The sum of the last four digits is %d\n", sum);
    return 0;
}

//output : The sum of the last four digits is 20



//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 height_cm = 172.0;
    double weight_kg = 69.0;

    double height_feet = height_cm * 0.393701/ 12;
    double weight_pound = weight_kg * 2.20462;

    printf("Height in feet: %lf\n", height_feet);
    printf("Weight in pounds: %.2lf\n", weight_pound);

    return 0;
}

//output : Height in feet: 5.643048
//         Weight in pounds: 152.12
```

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```c
//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


char option;
int sum = 0;
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 arr[9];

    for(int i =0; i < 9; i++){
        printf("enter the %dth integer: ", i+1);
        scanf("%d",&arr[i]);
    }

    for(int i = 0; i < 9; i++){
        if((i+1)%3 != 0){
            printf("%d,", arr[i]);
        }else{
            printf("%d\n", arr[i]);
        }
    }

    return 0;
}

// for input 1 2 3 4 5 6 7 8 9
// output : 1,2,3
//          4,5,6
//          7,8,9
```

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

Ans . 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”. C language has numerous libraries that include predefined functions to make programming easier.

It offers the features like library functions, data types, macros, etc by importing them into the program with the help of a preprocessor directive “#include”. These preprocessor directives are used to instruct the compiler that these files need to be processed before compilation.

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

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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 C are also inbuilt functions in C language. These inbuilt functions are located in some common location, and it is known as the library. All the functions are used to execute a particular operation. These library functions are generally preferred to obtain the predefined output.

four library function are printf(),scanf(),gets(),sqrt() etc.

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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 . 30 36 1E

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

Ans . here printf function will print the result which will be returned by scanf function . scanf function always returns the number of values that successfully assigned. so here printf function will print 2.

Q28. What will be the output of following program?

```
#include <stdio.h>

void main()

{

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

}
```

Ans . "C % FOR % PLACEMENT"

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```c
//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 () {
    float distance;
    printf("enter the distance : ");
    scanf("%f", &distance);
    float time = 4.0;

    float speed = distance / time;
    printf("speed = %02f km/hour\n", speed);
    return 0;
}


// for input 500 // output : speed = 125.00 km/hour

//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(){
    float satyam = 50.0;
    float suman = 70.0;
    float shyam = 80.0;

    float average = (satyam + suman + shyam)/3.0;
    printf("average: %0.2f\n", average);
}

// output : average: 66.67
```

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```c
//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 (){
    int saurabh ;
    int sajal;

    printf("Manoj,please enter the amount that you have given to Saurabh and Sajal separated by space accordingly\n");
    scanf("%d %d",&saurabh , &sajal);

    int temp = saurabh;

    saurabh = sajal;
    sajal = temp;

    printf("correct amount for saurabh: %d\n",saurabh);
    printf("correct amount for sajal: %d\n",sajal);
    return 0;
}

//for input 25 50 // output : correct amount for saurabh: 50
//                           correct amount for sajal: 25
```

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```c
//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(){
    int speed = 4;
    int time = 3;
    int distance;

    distance = speed*time;

    printf("Distance traveled: %d km\n", distance);

    return 0;
}

//output : Distance traveled: 12 km



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

#include <stdio.h>

int main()
{
printf("After this line a new line will be started.\n\tThis line started after putting a tab.");
}

Ans . Yes.
//output :After this line, a new line will be started.
//              This line started after putting a tab.
```

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

Ans. Comments in C language are used to provide information about lines of code. It is widely used for documenting code. There are 2 types of comments in the C language.

Single Line Comments

Multi-Line Comments

Single Line Comments

Single line comments are represented by double slash \\. Let's see an example of a single line comment in C.

Multi Line Comments

Multi-Line comments are represented by slash asterisk * ... *\. It can occupy many lines of code, but it can't be nested.

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

Ans. Here one should use addressOf operator(&) .... scanf("%d",&number);

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Q36. What will be the output?

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

Ans. Yes

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

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

Ans. gross-salary,salary of emp , avg. are not valid.

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```c
//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(){
    float rate = 25.0;
    float capacity = 175.0;

    float time = capacity/rate;

    printf("The time to clean the tank: %0.2f hours\n",time);
    return 0;
}


//output : The time to clean the tank: 7.00 hours

//Q39. The percent y (in decimal form) of battery power remaining x hours after you turn on a laptop computer is y =
```

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-0.2 x + 1. Develop a 'C' program to calculate after how many hours the battery power is at 75%?

```c
#include <stdio.h>

int main() {
    float batteryPower = 0.75;
    float slope = -0.2;
    float intercept = 1.0;


    float hours = (batteryPower - intercept) / slope;

    printf("After %0.2f hours, the battery power is at 75%%.\n", hours);

    return 0;
}

// output : After 1.25 hours, the battery power is at 75%.
```

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

Ans. compiler

Q41. What is the format specifier for an Octal Number?

Ans. %o

Q42. Which format specifier is used to print the exponent value upto 2 decimal places.

Ans. %.2e

Q43. Which of the following is not a basic data type?

Ans. array

Q44. What is the output of following code?

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

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```
void main()
{
  int x=0;
  x= printf("\"hello\b\"");
  printf(“%d”,x);
}
```

Ans."hell"8

Q45. What is the output of following code?

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

Ans. Garbage , 5

Q46. Which of the following is an identifier?

Ans. Basic_pay

Q47. What is the output of the following program?

```
#include<stdio.h>
void main()
{
   char x, a='c';
   x=printf("%c",a);
   printf(“%d”,x);
}
```

Ans.c1

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

Ans. a) (365.55)10 = (101101101.1000110)2
b) (453.65)10 = (705.514631463)8

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```
            c)    (5164.12)10   =  (20C.1EB)16
            d)    (23.65)10     =  (43.311111111)5
            e)    (772)10       =  (2152)7


Q49. Covert the following numbers to decimal number system-
Ans.        a)    (325.54)6                 = (125.944444444)10
            b)    (1001010110101.1110101)2  = (4789.9140625)10
            c)    (742.72)8                 = (482.90625)10
            d)    (AC94.C5)16               = (44180.76953125)10


Q50. Perform the following conversion from Hexadecimal to
other number as directed-
 (DB56.CD4)16 = (?)2,   (?)8,   (?)4

Ans. (11011110101010110.110011010100)2, (336526.6324)8 , (123311112.303110)4



Q51. Perform the following conversion from octal to other number as
directed-
(473.42)8 = (?)2,   (?)10,   (?)16,   (?)5

Ans . (100111011.100010)2,(315.625)10,(13B.82),(2230.303030)5



Q52. Find the value of A?
a)   (23)10 = (17)A
b)   (21)16 = (41)A
c)   (32)8 = (101)A

Ans.  a) (23)10   = (17)16
      b) (21)16   = (41)8
      c) (32)8    = (101)5



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

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```
}
```

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