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C ASSIGNMENT : 1

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() {
    float OPrice, TRate, FPrice;


    printf("Enter the original price of the product: RS");
    scanf("%f", &OPrice);

    printf("Enter the sales tax rate (as a percentage): ");
    scanf("%f", &TRate);


    FPrice = OPrice + (OPrice * (TRate / 100.0));


    printf("The final price of the product after adding %.2lf%% tax is: RS%.2lf\n", TRate, FPrice);

    return 0;
}
```

output:
Enter the original price of the product: RS500
Enter the sales tax rate (as a percentage): 10
The final price of the product after adding 10.00% tax is: RS550.00

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

```
#include <stdio.h>

int main() {
    float a, b, c;


    printf("Enter wages per hour: ");                  // WAGES/HR= a, WORK HOURS= b, WEEKLY WAGES
=c
    scanf("%f", &a);

    printf("Enter hours worked in a week: ");
    scanf("%f", &b);


    if (b <= 30) {
        c = a * b;
    } else {

        float regularPay = a * 30;


        float extraHours = b - 30;
        float extraPay = a * 2 * extraHours;


        c = regularPay + extraPay;
    }


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

    return 0;
}
```

OUTPUT:
Enter wages per hour: 500
Enter hours worked in a week: 50
Weekly wages: 35000.00

Q.3 Mr. X goes to market for buying some fruits and vegetables. He is having a currency of Rs 500 with hi m 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 cu rrency of Rs. 500 to the shopkeeper. Find out the amount shopkeeper will return to X by writing a C progr am.

```
#include <stdio.h>

int main() {
    float budget = 500.0;
    float apple_price_per_kg = 50.0;
    float mango_price_per_kg = 35.0;
```

```
    float potato_price_per_kg = 10.0;
    float tomato_price_per_kg = 15.0;

    float apple_weight = 2.0;
    float mango_weight = 1.5;
    float potato_weight = 2.5;
    float tomato_weight = 1.0;

    float total_cost = (apple_price_per_kg * apple_weight) +
                       (mango_price_per_kg * mango_weight) +
                       (potato_price_per_kg * potato_weight) +
                       (tomato_price_per_kg * tomato_weight);


    float amount_returned = budget - total_cost;


    printf("Amount returned to Mr. X: Rs %.2lf\n", amount_returned);

    return 0;
}
```

output:
Amount returned to Mr. X: Rs 307.50

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: SHIVAM YADAV\n");

    printf("Date of Birth: 09 MARCH,2005\n");

    printf("Mobile Number: 9315565145\n");

    return 0;
}
```

OUTPUT:
Name: SHIVAM YADAV
Date of Birth: 09 MARCH,2005
Mobile Number: 9315565145

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;
    char character;
    float float__;


    printf("Enter an integer:");
    scanf("%d", &integer);

    printf("Enter a character: ");
    scanf(" %c", &character);


    printf("Enter a float value: ");
    scanf("%f", &float__);


    printf("Integer: %d\n", integer);
    printf("Character: %c\n", character);
    printf("Float Value: %.2f\n", float__);

    return 0;
}
```

OUTPUT:

```
 Enter an integer:
60
Enter a character: A
Enter a float value: .67
Integer: 60
Character: A
Float Value: 0.67
```

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

The sales total is : $ 172.53

```
#include <stdio.h>

int main() {

    float cost = 172.53;


    printf("THE TOTAL SALE IS : $ %.2f\n", cost);

    return 0;
}
```

OUTPUT:
THE TOTAL SALE IS : $ 172.53

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

```
#include <stdio.h>

int main() {

    float applesperperson = 6.5;

    float totalapples = applesperperson * 3;

    printf("Raju has %.1lf apples in total without adding them.\n", totalapples);

    return 0;
}
```

output:
Raju has 19.5 apples in total without adding them.

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

```
#include <stdio.h>

int main() {
    float floatingpointvalue = 12345.6789;

    printf("Floating-point value in exponential format: %.2e\n", floatingpointvalue);

    return 0;
}
```

output:
Floating-point value in exponential format: 1.23e+004

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

```
#include <stdio.h>

int main() {
    char mobileNumber[11];


    printf("Please enter your mobile number (10 digits): ");
```

```
    scanf("%s", mobileNumber);


    printf("Your mobile number is: %s\n", mobileNumber);

    return 0;
}
```

output:
Please enter your mobile number (10 digits): 9315565133
Your mobile number is: 9315565133

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

```
#include <stdio.h>

int main() {
    int initial_population = 30000;
    double first_year_growth = 0.20;
    double second_year_growth = 0.30;


    double population_after_first_year = initial_population + (initial_population * first_year_growth);


    double population_after_second_year = population_after_first_year + (population_after_first_year * sec
ond_year_growth);


    printf("Population after two years: %.0lf\n", population_after_second_year);

    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 alpha;
```

```
    printf("Enter a character: ");
    scanf("%c", &alpha);


    printf("The ASCII value of character is %d\n",alpha);

    return 0;
}
```

OUTPUT:
Enter a character: A
The ASCII value of character is 65

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 basic pay: ");
    scanf("%f", &basicPay);

    hra = 0.15 * basicPay;
    ta = 0.20 * basicPay;


    salary = basicPay + hra + ta;


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

    return 0;
}
```

output:
Enter basic pay: 50000
Salary = 67500.00

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;

    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);


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


    double angle_rad = atan(slope);
    double angle_deg = angle_rad * 180.0 / M_PI;


    printf("Slope of the line: %.2lf\n", slope);
    printf("Angle of inclination (in degrees): %.2lf\n", angle_deg);

    return 0;
}
```

output:
Enter the coordinates of point P (xp yp): 5 2
Enter the coordinates of point Q (xq yq): 2 1
Slope of the line: 0.33
Angle of inclination (in degrees): 18.43

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.

```
#include <stdio.h>

int main() {

    float g1, g2, g3, g4, g5;
    float c1, c2, c3, c4, c5;


    printf("Enter grade points for each course (g1 g2 g3 g4 g5): ");
    scanf("%f %f %f %f %f", &g1, &g2, &g3, &g4, &g5);

    printf("Enter credits for each course (c1 c2 c3 c4 c5): ");
    scanf("%f %f %f %f %f", &c1, &c2, &c3, &c4, &c5);


    float spi = (g1 * c1 + g2 * c2 + g3 * c3 + g4 * c4 + g5 * c5) / (c1 + c2 + c3 + c4 + c5);
```

```
    // Display the SPI
    printf("SPI: %.2f\n", spi);

    return 0;
}
```

OUTPUT:
Enter grade points for each course (g1 g2 g3 g4 g5): 90
80
90
90
80
Enter credits for each course (c1 c2 c3 c4 c5): 80
80
90
90
60
SPI: 86.50

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

```
#include<stdio.h>
#include<math.h>
  int main()
  {
   float f,l;
   int c;
   c=3*pow(10,8);
   printf("enter the wavelength(l):");
   scanf("%f",&l);
   f=c/l;
   printf("the frequency is %f",f);

   return 0;



  }
```

OUTPUT:
enter the wavelength(l):500
the frequency is 600000.000000

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 velo city of the car? [Hint: v2 = u2 + 2as]

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

```
int main()
{
 int v,u=30,a=5,s=70,v1;


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


  printf("THE FINAL VELOCITY OF THE CAR IS %d",v );
  return 0;




}
```
OUTPUT:
THE FINAL VELOCITY OF THE CAR IS 40

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()
{
 int v, u=0 ,t=3 ,a=4;
 float s;
 v= u+a*t;
 printf("THE FINAL VELOCITY OF THE HORSE IS %d\n", v);

 s= (u*t)+(0.5)*a*t*t;
 printf("THE DISTANCE COVERED BY THE HORSE IN 3 SEC IS %f", s);

 return 0;


}
```

OUTPUT:
 THE FINAL VELOCITY OF THE HORSE IS 12
THE DISTANCE COVERED BY THE HORSE IN 3 SEC IS 18.000000

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

```
#include<stdio.h>
int main(){
 int a,b;
 printf("Enter Your University Roll No.");
 scanf("%d",&a);
```

```
 b=a%10000;
 printf("the last four digits are: %d",b);




 return 0;

}
```

output:
Enter Your University Roll No.19121316
the last four digits are: 1316

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

```
#include<stdio.h>
int main()
{

 float h,w,height,weight;
 printf("enter the height in cms and weight in kgs:");
 scanf("%f %f",&h, &w);
 height=(h*0.393701)/12;
 printf("the height in feets:%f",height);
 weight=w*2.20462;
 printf("the weight in pounds:%f",weight);
 return 0;
}
```

OUTPUT:
enter the height in cms and weight in kgs:165 50
the height in feets:5.413389the weight in pounds:110.231003

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

a) A character variable named option.

=> char option;

b) An integer variable sum initialized to 0

= int sum=0;

c) A floating point variable, product, initialized to 1

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

 printf("enter 9 different inputs");
 scanf("%d %d %d %d %d %d %d %d %d", &a,&b,&c,&d,&e,&f,&g,&h,&i);

 printf("%d %d %d\n%d %d %d\n%d %d %d\n",a,b,c,d,e,f,g,h,i);

 return 0;
}
```

output:
```
 enter 9 different inputs1 2 3 4 5 6 7 8 9
1 2 3
4 5 6
7 8 9
```

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

HEADER FILES : In C language, header files contain a set of predefined standard library functions.

ITS USES ARE:
Header files in C/C++ language contains a huge set of declarations of various functions.
These declarations which are unbothered by the programmer,
are written so as to achieve a specific use for it.

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);
}
```

OUTPUT = 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);
    }
```

OUTPUT: GLAUNIVERSITY14

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

Library functions are built-in functions that are grouped together and placed in a common location called li brary. Each function here performs a specific operation. We can use this library functions to get the pre-de fined output.

1. printf()
2. scanf()
3. pow()
4. int main()

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);
  }
```

OUTPUT :
C is placement oriented LanguageHi30 36 1e

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

That means on inputing 2 numbers in a and b output will come 2.

Q28. What will be the output of following program?

```
#include <stdio.h>
void main()
{
  printf(" \"C %% FOR %% PLACEMENT\"");
}
```

output:
"C % FOR % PLACEMENT"

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

```
#include <stdio.h>
int main()
{

float m, speed, time=4;

printf("enter the distance between GLA UNIVERSITY AND DELHI (in kms):");
scanf("%f", &m);

speed= m / time;

printf("THE SPEED OF THE BUS IS (in km/hr) %f", speed);

return 0;
}
```

output:
enter the distance between GLA UNIVERSITY AND DELHI (in kms):200
THE SPEED OF THE BUS IS (in km/hr) 50.000000

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

```
#include <stdio.h>

int main() {
    int marksofsatyam = 50;
    int marksofsuman = 70;
    int marksofshyam = 80;


    double averagemarks = (marksofsatyam + marksofsuman + marksofshyam) / 3;


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

    return 0;
}
```

output:
Average marks of Satyam, Suman, and Shyam: 66.00

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

```
#include <stdio.h>

int main() {
    double saurav_money, sajal_money, temp;


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

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


    temp = saurav_money;
    saurav_money = sajal_money;
    sajal_money = temp;


    printf("After rectifying the mistake:\n");
    printf("Amount of money given to Saurav: %.2lf\n", saurav_money);
    printf("Amount of money given to Sajal: %.2lf\n", sajal_money);

    return 0;
}
```

output:
Enter the amount of money given to Saurav: 200
Enter the amount of money given to Sajal: 500
After rectifying the mistake:
Amount of money given to Saurav: 500.00
Amount of money given to Sajal: 200.00

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

```
#include<stdio.h>

int main()
{
 int speed=4;
 float d, time=0.05;
```

```
 d= speed / time;

 printf("THE DISTANCE TRAVELLED BY THE PERSON IS %f", d);

 return 0;
}
```

output:
THE DISTANCE TRAVELLED BY THE PERSON IS 80.000000

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?

The comments in C are human-readable explanations or notes in the source code of a C program. A com ment makes the program easier to read and understand. These are the statements that are not executed by the compiler or an interpreter.

It is considered to be a good practice to document our code using comments.

When and Why to use Comments in C programming?
1. A person reading a large code will be bemused if comments are not provided about details of the progr am.
2. C Comments are a way to make a code more readable by providing more descriptions.
3. C Comments can include a description of an algorithm to make code understandable.
4. C Comments can be used to prevent the execution of some parts of the code.

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

ANS. In this statement number variable is not preceding by &.....

Q36. What will be the output?

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

OUTPUT: NO

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

=== The invalid variable names are "gross-salary" and "salary of emp."===

Q38. Tom works at an aquarium shop on Saturdays. One Saturday, when Tom gets to work, he is asked t o clean a 175-gallon reef tank. His first job is to drain the tank. He puts a hose into the tank and starts a si phon. Tom wonders if the tank will finish draining before he leaves work. He measures the amount of wat er 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.
Q39. The percent y (in decimal form) of battery power remaining x hours after you turn on a laptop compu ter is y = −0.2 x + 1. Develop a 'C' program to calculate after how many hours the battery power is at 75% ?

Q 40. Which of the following is used to convert the high
level language in machine language in a single go?

ANS : (a) compiler

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

ANS: (c) %O

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

ANS: (d) %2e

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

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)

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: (d)

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

ANS: (b)

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)