COMPUTER ASSIGNMENT-1

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Section - AY

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.

Ans-1

```
#include <stdio.h>

int main() {
   float taxRate, originalPrice, finalPrice;
   printf("Enter the tax rate (in percentage): ");
   scanf("%f", &taxRate);
   printf("Enter the original price of the product: ");
   scanf("%f", &originalPrice);
   finalPrice = originalPrice + (originalPrice * (taxRate / 100.0));
   printf("The final price after adding %.2f%% tax is: $%.2f\n", taxRate, finalPrice);
   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.

Ans-2

```
#include <stdio.h>

int main() {
   float wagesPerHour, hoursWorked, weeklyWages;
   printf("Enter wages per hour: ");
   scanf("%f", &wagesPerHour);
   printf("Enter hours worked in a week: ");
   scanf("%f", &hoursWorked);
   if (hoursWorked <= 30) {
      weeklyWages = wagesPerHour * hoursWorked;
   } else {
```

```
        weeklyWages = (wagesPerHour * 30) + (wagesPerHour * 2 * (hoursWorked -
30));
    }
    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.

Ans-3

```
#include <stdio.h>

int main() {
    float totalCost = (2.0 * 50.0) + (1.5 * 35.0) + (2.5 * 10.0) + (1.0 * 15.0);
    float amountPaid = 500.0;
    float amountReturned = amountPaid - totalCost;
    printf("Amount returned to Mr. X: Rs. %.2f\n", amountReturned);
    return 0;
}
```

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

Ans-4

```
#include <stdio.h>

int main() {
    printf("Name: Raj Sharma\n");
    printf("Date of Birth: 28/10/2006\n");
    printf("Mobile Number: 9258603631\n");

    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-5

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

```
int main() {
    int integerInput;
    char charInput;
    float floatInput;

    printf("Enter an integer: ");
    scanf("%d", &integerInput);
    printf("Enter a character: ");
    scanf(" %c", &charInput);
    printf("Enter a float value: ");
    scanf("%f", &floatInput);

    printf("Integer: %d\n", integerInput);
    printf("Character: %c\n", charInput);
    printf("Float: %.2f\n", floatInput);

    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-6

```
#include <stdio.h>

int main() {
    float cost = 172.53; // Replace this with your actual cost value

    printf("The sales total is: $%.2f\n", 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.
Ans-7

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

```
int main() {
    int applesFromRaghu = 6.5;
    float applesFromSheenu = 6.5;
    float applesFromAkash = 6.5;

    float totalApples = applesFromRaghu + applesFromSheenu + applesFromAkash;

    printf("Raju has a total of %.1f apples.\n", totalApples);

    return 0;
}
```

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

Ans-8

```
#include <stdio.h>

int main() {
    double value = 123456.789;
    printf("Value in exponential format: %.2e\n", value);

    return 0;
}
```

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

Ans-9

```
#include <stdio.h>

int main() {
    long long int mobileNumber;

    printf("Enter your 10-digit mobile number: ");
    scanf("%lld", &mobileNumber);

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

    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-10

```
#include <stdio.h>

int main() {
    int initialPopulation = 30000;
    float increasePercentageYear1 = 0.20; // 20% increase
    float increasePercentageYear2 = 0.30; // 30% increase


    int populationYear1 = initialPopulation + (initialPopulation *
increasePercentageYear1);

    int populationYear2 = populationYear1 + (populationYear1 *
increasePercentageYear2);

    printf("Population after two years: %d\n", populationYear2);

    return 0;
}
```

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

Ans-11

```
#include <stdio.h>

int main() {
    char character;

    printf("Enter a character: ");
    scanf("%c", &character);
    int asciiValue = (int)character;
    printf("The ASCII value of '%c' is %d\n", character, asciiValue);

    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-12

```
#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 breakdown:\n");
   printf("Basic Pay: %.2f\n", basicPay);
   printf("HRA: %.2f\n", HRA);
   printf("TA: %.2f\n", TA);
   printf("Total Salary: %.2f\n", 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-13

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

int main() {
   double xp, yp, xq, yq, slope, angle;

   printf("Enter coordinates of point P (xp yp): ");
   scanf("%lf %lf", &xp, &yp);

   printf("Enter coordinates of point Q (xq yq): ");
   scanf("%lf %lf", &xq, &yq);

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

   angle = atan(slope) * (180.0 / M_PI);

   printf("Slope of the line: %.2lf\n", slope);
   printf("Angle of inclination: %.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 g1, g2, g3,…….gk etc. and the corresponding credits are c1, c2, c3,……ck, the SPI is given by:

Ans-14

```
#include <stdio.h>
 int main()
{
 int g1,g2,g3,g4,g5,c1,c2,c3,c4,c5,spi;
 printf("Enter grade point: \n");
 scanf("%d%d%d%d%d",&g1,&g2,&g3,&g4,&g5);
 printf("Enter credit point: \n");
 scanf("%d%d%d%d%d",&c1,&c2,&c3,&c4,&c5);
 spi=1.0*(g1*c1 + g2*c2 + g3*c3 + g4*c4+g5*c5)/(c1+c2+c3+c4+c5);
 printf("spi = %d",spi);
}
```

Q15. Write a program to calculate the frequency (f) of a given wave with wavelength (λ) and speed (c), where c=λ*f.

Ans-15

```
#include <stdio.h>

int main() {
   float speedOfWave, wavelength, frequency;

   printf("Enter the speed of the wave (in meters per second): ");
   scanf("%f", &speedOfWave);

   printf("Enter the wavelength (in meters): ");
   scanf("%f", &wavelength);

   // Calculate the frequency
   frequency = speedOfWave / wavelength;

   printf("The frequency of the wave is: %.2lf Hz\n", frequency);

   return 0;
}
```

Q16. 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]

Ans-16

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

int main() {
   double u = 30.0;
   double a = 5.0;
```

```
    double s = 70.0;
    double v;

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

    printf("The final velocity of the car is: %.2f m/s\n", v);

    return 0;
}
```

Q17. 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]
Ans-17

```
#include <stdio.h>

int main() {
    float u = 0.0;   // Initial velocity (horse starts from rest)
    float a = 4.0;   // Acceleration in m/s^2
    float t = 3.0;   // Time in seconds
    float v, s;

    v = u + (a * t);
    s = u * t + 0.5 * a * t * t;

    printf("(a) The final velocity of the horse is: %.2f m/s\n", v);
    printf("(b) The distance traveled by the horse is: %.2f meters\n", s);

    return 0;
}
```

Q18. Write a program to find the sum of your four last digit of your university roll number .
Ans-18

```
#include <stdio.h>

int main() {
    int rollNumber;

    printf("Enter your university roll number: ");
    scanf("%d", &rollNumber);

    int lastFourDigits = rollNumber % 10000;

    int sum = 0;
    while (lastFourDigits > 0) {
        sum += lastFourDigits % 10;
        lastFourDigits /= 10;
    }
```

```
    printf("The sum of the last four digits of your roll number is: %d\n", sum);

    return 0;
}
```

Q19.
Ans-19

```
#include <stdio.h>

int main() {
    float heightInCm = 175.0; // Replace with your height in cm
    float weightInKg = 70.0;  // Replace with your weight in kg

    const float CM_TO_INCH = 0.393701;
    const float KG_TO_POUND = 2.20462;

    float heightInFeet = heightInCm * CM_TO_INCH / 12.0;
    float weightInPounds = weightInKg * KG_TO_POUND;

    printf("Your height in feet: %.2f feet\n", heightInFeet);
    printf("Your weight in pounds: %.2f pounds\n", weightInPounds);

    return 0;
}
```

Q20. Code the variable declarations for each of following:
1.) A character variable named option.
2.) An integer variable sum initialized to 0
3.) A floating point variable, product, initialized to 1

Ans-20

```
    1.) char option;
    2.) int sum = 0;
    3.) float product = 1;
```

Q21. Write a program that reads nine integers. Display these numbers by printing three numbers in a line separated by commas.
Ans-21

```
#include <stdio.h>

int main() {
    int num1, num2, num3, num4, num5, num6, num7, num8, num9;

    printf("Enter nine integers, one at a time:\n");
    scanf("%d", &num1);
    scanf("%d", &num2);
    scanf("%d", &num3);
    scanf("%d", &num4);
```

```
    scanf("%d", &num5);
    scanf("%d", &num6);
    scanf("%d", &num7);
    scanf("%d", &num8);
    scanf("%d", &num9);

    printf("%d, %d, %d\n", num1, num2, num3);
    printf("%d, %d, %d\n", num4, num5, num6);
    printf("%d, %d, %d\n", num7, num8, num9);

    return 0;
}
```

Q22. What are header files and what are its uses in C programming?
Ans-22
Header files in C programming contain predefined functions and libraries that you can use in your programs without having to write them from scratch. They make coding faster and easier. Just include a header file at the beginning of your program, and you can use the stuff inside it.. It's like borrowing code from a library. Some common header files are <stdio.h> for input and output and <math.h> for math functions.

Q23. What will be the output of the following program?

```
#include<stdio.h>
int main()
{   int num=070;
printf(“%d\t%o\t%x”,num,num,num);
}
```

Ans-23
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);
           }
```

Ans-24
Output: GLA UNIVERSITY14

Q25. What are library functions? List any four library functions.
Ans-25
Library functions are like ready-made tools in C programming. They're functions that are already written and available in libraries, so you can use them without having to write the code yourself. They save time and effort. Here are four examples:

1. `printf()`: Used to print stuff on the screen.
2. `scanf()`: Used to get input from the user.

3. `strlen()`: Used to find the length of a string.
4. `sqrt()`: Used to calculate the square root of a number.

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-26
Output: C is placement oriented LanguageHi30 36 1e

Q27. What is the meaning of the following statement? printf("%d",scanf("%d%d",&a,&b));
Ans-27
scanf("%d%d", &a, &b): This scanf function is used to read two integer values from the user and store them in the variables a and b. It expects the user to input two integers separated by whitespace.

printf("%d", ...);: This printf function is used to print the value returned by the scanf function. However, there is a potential issue with this statement.

The problem is that the scanf function returns the number of successfully read items. In this case, if the user enters two integers successfully, scanf will return 2, and the printf function will print 2 as the output.

However, the printf format specifier %d expects an integer argument, but scanf returns an integer. Therefore, this code may not work as expected and could result in undefined behavior.

Q28. What will be the output of the following program?

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

Ans-28
Output: "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 the speed of a bus.
Ans-29

```
#include <stdio.h>

int main() {
   double distanceInKm, timeInHours, speedInKmph;
```

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

    timeInHours = 4.0;
    speedInKmph = distanceInKm / timeInHours;

    printf("The speed of the bus is: %.2lf km/h\n", speedInKmph);

    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-30

```
#include <stdio.h>

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

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

    printf("The average marks of Satyam, Suman, and Shyam is: %.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.

Ans-31

```
#include <stdio.h>

int main() {
    float sauravMoney, sajalMoney, temp;

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

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

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

```
    printf("After rectifying the mistake:\n");
    printf("Money given to Saurav: %.2f\n", sauravMoney);
    printf("Money given to Sajal: %.2f\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.
Ans-32

```
#include <stdio.h>

int main() {
    float  speedKmph = 4.0;
    float timeHours = 0.05;
    float distanceKm;

    distanceKm = speedKmph * timeHours;

    printf("The distance you traveled is: %.2f km\n", distanceKm);

    return 0;
}
```

Q33. Can two or more escape sequences such as \n and \t be combined in a single line of program code?
Ans-33
Yes, you can combine multiple escape sequences in a single line of program code in C or many other programming languages. Escape sequences are used to represent special characters and control codes within strings. For example, you can combine \n for a newline and \t for a tab in a single line to format text:

```
printf("Hello,\n\tWorld!");
```

Output: Hello,
        World!

Q34. What are comments and how do you insert it in a C program?
Ans-34
Comments in a C program are non-executable statements used for documentation or explanations within the source code. They are meant to provide human-readable information about the code and are ignored by the compiler when the program is compiled.
Example:

```
// This is a single-line comment
int x = 5; // This comment explains the variable assignment
```

Q35. What is wrong in this statement? scanf("%d",number);
Ans-35

The '&' operator is missing which tells the location of the variable so that the value can be saved to that variable. Here that is missing so the code will not run as expected.

Q36. What will be the output?

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

Ans-36
Output: No
Q37. Point out which of the following variable names are invalid:
gross-salary INTEREST , salary of emp , avg. , thereisbookinmysoup

Ans-37
Invalid Variables: 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-38

```
#include <stdio.h>

int main() {
   float tankCapacity = 175.0; // Gallons
   float drainRate = 25.0;    // Gallons per hour
   float timeRequired;

   // Calculate the time required to drain the tank
   timeRequired = 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 $y = -0.2x + 1$. Develop a 'C' program to calculate after how many hours the battery power is at 75%?

Ans-39

```
#include <stdio.h>

int main() {
   double targetPower = 0.75;  // 75% in decimal form
   double batteryPower;
   double hours = 0;  // Initialize hours to 0


   while (1) {
      batteryPower = -0.2 * hours + 1;

      if (batteryPower >= targetPower) {
         break;
      }

      hours += 1; // Increment hours by 1
   }

   printf("The battery power is at 75%% after %.2lf 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

Ans-40

a. Compiler

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

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

Ans-41

c. %o

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

a. %e b.%.2f c. %f d.%.2e

Ans-42

D. %.2e

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

a. char

b. array
c. float
d. int

Ans-43
b. Array

Q44. What is the output of following code?

```
#include<stdio.h>
void main()
{
  int x=0;
  x= printf("\"hello\b\"");
  printf("%d",x);
}
```

Ans-44
Output: "hell"8

Q45.

```
#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-45
D. Garbage, 5

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

Ans-46
B. Basic_pay

Q47.

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

Ans-47
Output: c1

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

a. (365.55)10 = (?)2 ⇒ 101101101.10001100110011001101
b. (453.65)10 = (?)8 ⇒ 705.51463
c. (5164.12)10 = (?)16 ⇒ 142C.1EB851
d. (23.65)10 = (?)5 ⇒ 43.230
e. (772)10 = (?)7 ⇒ 2152

Q49. Convert the following numbers to decima number system-

a. (325.54)6 = (?)10 ⇒ 125.9444
b. (1001010110101.1110101)2 = (?)10 ⇒ 4789.9140625
c. (742.72)8 = (?)10 ⇒ 482.90625
d. (AC94.C5)16 = (?)10 ⇒ 44180.76953125

Q50. Perform the following conversion from Hexadecimal to other number as directed-
(DB56.CD4)16 = (?)2, (?)8, (?)4
Ans-50
$(1101101101010110.1100110101)_2$
$(31231112.30311)_4$
$(155526.6324)_8$

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

Ans-51
$(100111011.10001)_2$
$(315.53125)_{10}$
$(13B.88)_{16}$
$(2230.23120034)_5$

Q52. Find the value of A?
a. $(23)10 = (17)_A$ ⇒ A =16
b. $(21)16 = (41)_A$ ⇒ A = 8
c. $(32)8 = (101)_A$ ⇒ A = 5

Q53.
```
#include <stdio.h>
void main(){
int  a=32770;
printf("%d",a);
}
```
Ans-53
Output: -32766

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

}
Ans-54
Output: Temperature in Fahrenheit is 37.00