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Al-1

Roll no. 10

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 price, rate, tp;
 printf("Enter the original price of the product");
 scanf("%f", &price);
 printf("Enter the sales tax rate ");
 scanf("%f", &rate);
 tp = price + (price * (rate / 100));
 printf("The total price after adding %.2f%% tax is: $%.2f\n", rate, tp);
 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>
int main() {
 float hourlyWage, weeklyWages;
 int hoursWorked;
 printf("Enter the hourly wage: $");
 scanf("%f", &hourlyWage);
 printf("Enter the number of hours worked in a week: ");
 scanf("%d", &hoursWorked);
 if (hoursWorked <= 30)
{
 weeklyWages = hourlyWage * hoursWorked;
```

```
 } else
{
 weeklyWages = hourlyWage * 30;
 int extraHours = hoursWorked - 30;
 weeklyWages += (hourlyWage * 2) * extraHours;
 }
 printf("Weekly wages: $%.2f\n", weeklyWages);
return 0;
}
```

Q3. 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 kgApple = 2.0, kgMango = 1.5, kgPotato = 2.5, kgTomato = 1.0;
 float priceApple = 50.0, priceMango = 35.0, pricePotato = 10.0, priceTomato = 15.0;
 float totalCost = (kgApple * priceApple) + (kgMango * priceMango) + (kgPotato * pricePotato) +
(kgTomato * priceTomato);
 float currency = 500.0;
 float amountToReturn = currency - totalCost;
 printf("Amount to be returned to Mr. X: Rs. %.2f\n", amountToReturn);
 return 0;
}
```

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

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

```
 char name[] = "Your Name";
 char dob[] = "Your Date of Birth";
 char mobile[] = "Your Mobile Number";
 printf("%s\n%s\n%s\n", name, dob, mobile);
 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>
int main() {
 int i;
 char c;
 float f;
 scanf("%d", &i);
 scanf(" %c", &c);
 scanf("%f", &f);
 printf("%d\n%c\n%.2f\n", i, c, f);
 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

```
#include <stdio.h>
int main() {
 float cost = 172.53;
 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.

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

```
int main() {
 int applesFromRaghu = 6;
 float applesFromSheenu = 0.5;
 float applesFromAkash = 0.5;
 float totalApples = applesFromRaghu + applesFromSheenu + applesFromAkash;
 printf("Raju has a total of %.2f apples.\n", totalApples);
 return 0;
}
```

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

```
#include <stdio.h>
int main() {
 float val;
 printf("Enter a floating-point value: ");
 scanf("%f", &val);
 printf("Exponential format: %.2e\n", val);
 return 0;
}
```

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

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

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

```
int main() {
 float population = 30000;
 population *= 1.20;
 population *= 1.30;
 printf("Population after two years: %.0f\n", population);
 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("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>
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 of the employee: %.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.

```
#include <stdio.h>
#include <math.h>
int main() {
 float xp, yp, xq, yq, slope, angle;
 printf("Enter the coordinates of point P (xp yp): ");
 scanf("%f %f", &xp, &yp);
 printf("Enter the coordinates of point Q (xq yq): ");
 scanf("%f %f", &xq, &yq);
 slope = (yq - yp) / (xq - xp);
 angle = atan(slope) * 180.0 / M_PI;
 printf("Slope of the line: %.2f\n", slope);
 printf("Angle of inclination: %.2f 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:

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

Where, k is the number of courses for which the candidate remains registered for during the semester/

trimester. Write a program in C to calculate SPI for k =5.

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

```
int k = 5;
float gp[5];
float cr[5];
for (int i = 0; i < k; i++) {
printf("Enter grade points for course %d: ", i + 1);
scanf("%f", &gp[i]);
printf("Enter credits for course %d: ", i + 1);
scanf("%f", &cr[i]);
}
float spi = 0.0;
for (int i = 0; i < k; i++) {
spi += (gp[i] * cr[i]);
}
spi /= k;
printf("SPI for k = 5
```

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() {
float c, l, f;
printf("Enter the speed (c) of the wave: ");
scanf("%f", &c);
printf("Enter the wavelength (λ) of the wave: ");
scanf("%f", &);
f = c / l;
printf("The frequency (f) of the wave is: %.2f\n", f);
return 0;
}
```

Q 16. A car travelling at 30 m/s accelerates steadily at 5 m/s2 for a distance of 70 m. What is the final velocity of the car? [Hint: v2 = u2 + 2as]

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

```
int main() {
 float u = 30.0;
 float a = 5.0;
 float s = 70.0;
 float v;
 v = sqrt(u * u + 2 * a * s);
 printf("The final velocity of the car is: %.2f m/s\n", v);
return 0;
}
```

Q 17.A horse accelerates steadily from rest at 4 m/s2 for 3s. (a) What is its final velocity? (b) How far has it travelled? [Hint: (a) v = u + at (b) s = ut + ½at2]

```
#include <stdio.h>
int main() {
 float u = 0.0;
 float a = 4.0;
 float t = 3.0;
 float v;
 v = u + a * t;
 printf("Final velocity: %.2f m/s\n", v);
 s = u * t + 0.5 * a * t * t;
 printf("Distance traveled: %.2f meters\n", s);
 return 0;
}
```

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 rollNumber =16050025;
 for (int i = 0; i < 4; i++) {
 sum += rollNumber % 10;
 rollNumber /= 10;
 }
```

```
 printf("Sum of last four digits of roll number: %d\n", sum);
 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 feets and pounds respectively.

Note :- 1 cm = 0.393701inch , 1 Kg = 2.20462

```
#include <stdio.h>
int main() {
 float heightCm = 175.0;
 float weightKg = 70.0
 float heightFt, weightLb;
 heightFt = heightCm * 0.393701 / 12.0;
 weightLb = weightKg * 2.20462;
 printf("Height in feet: %.2f ft\n", heightFt);
 printf("Weight in pounds: %.2f lb\n", weightLb);
 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

```
a) char option;
b) int sum = 0;
c) 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 numbers[9];
 printf("Enter nine integers:\n");
 for (int i = 0; i < 9; i++) {
```

```
scanf("%d", &numbers[i]);
}
printf("Numbers:  ");
for (int i = 0; i < 9; i++) {
if (i % 3 == 2) {
printf("%d", numbers[i]);
} else {
printf("%d, ", numbers[i]);
}
}
printf("\n");
return 0;
}
```

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

Header files in C are files containing declarations of functions, variables, and macros that are used in one or more source code files. They are used to provide necessary information to the compiler and linker about the functions and variables that will be used in the program. Header files are typically included at the beginning of C source code files using #include preprocessor directives. They help in organizing code, promoting reusability, and simplifying the inclusion of external libraries or modules.

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);
}
```

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);
 }
```

GLA UNIVERSITY11

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

Library functions in C are pre-written functions provided by the C standard library and other libraries that perform common tasks or operations. They can be used to simplify programming and avoid rewriting code for frequently performed tasks. Some common library functions in C include:

printf: Used for formatted output.

scanf: Used for formatted input.

strlen: Calculates the length of a string.

sqrt: Calculates the square root of a number.

These library functions are included in standard C library headers and can be used by including the appropriate header files and calling the functions

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);
}
```

26 32 1a

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

This statement reads two integer values from the user using scanf. It returns the number of values successfully read. In this case, if both values are successfully read, it returns 2, which is then printed using printf.

Q28. What will be the output of following program?

```
#include <stdio.h>
void main()
{
 printf(" \"C %% 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>
int main() {
 float distanceKm, timeHrs, speed;
 printf("Enter the distance between GLA University and Delhi (in km): ");
 scanf("%f", &distanceKm);
 printf("Enter the time taken to reach Delhi by BUS (in hours): ");
 scanf("%f", &timeHrs);
 speed = distanceKm / timeHrs;
 printf("The speed of the bus is: %.2f km/hr\n", speed);
 return 0;
}
```

Q30. In an exam Satyam got 50 marks, Suman got 70 marks and Shyam got 80 marks, Write a ‘C’

program to find average marks of these three participants.

```
#include <stdio.h>
int main() {
 int satyamMarks = 50, sumanMarks = 70, shyamMarks = 80;
 float averageMarks;
 averageMarks = (satyamMarks + sumanMarks + shyamMarks) / 3.0;
 printf("Average marks of Satyam, Suman, and Shyam: %.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.

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

```
 printf("Enter the amount of money given to Saurav: ");
 scanf("%f", &sauravMoney);
 printf("Enter the amount of money given to Sajal: ");
 scanf("%f", &sajalMoney);
 float temp = sauravMoney;
 sauravMoney = sajalMoney;
 sajalMoney = temp;
 printf("Mistake rectified:\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.

```
#include <stdio.h>
int main() {
 float speedKmPerHr = 4.0;
 float timeMin = 3.0;
 float distanceKm;
 distanceKm = (speedKmPerHr * timeMin) / 60.0;
 printf("Distance traveled: %.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?

Yes, you can combine multiple escape sequences in a single line of program code. For example, you can include both \n (newline) and \t (tab) in the same line to format text with line breaks and tabs.

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

Comments in C are used to provide explanations or notes within the code. They are not executed by

the compiler and are purely for human understanding. In C, you can insert comments using two methods:

Single-line comments: Begin with // and continue until the end of the line. For example: // This is a single-line comment.

Multi-line comments: Enclosed between /* and */ and can span multiple lines. For example:

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

The issue with the statement scanf("%d", number); is that the variable number should be preceded by

the & (address-of) operator because scanf requires the address of the variable where it should store the input value. The corrected statement should be scanf("%d", &number);.

Q36. What will be the output?

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

The output of the program will be "Yes."

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

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

gross-salary: Invalid because it contains a hyphen, which is not allowed in variable names.

salary of emp: Invalid because it contains spaces, which are not allowed in variable names.

avg.: Invalid because it contains a period, which is not allowed in variable names.

thereisbookinmysoup: Valid as it consists of letters and digits without any invalid characters.

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 tankSize = 175.0;
 float drainRate = 25.0;
 float timeHours;
 timeHours = tankSize / drainRate;
 printf("Time required to completely clean the tank: %.2f hours\n", timeHours);
 return 0;
}
```

Q39. The percent y (in decimal form) of battery power remaining x hours after you turn on a laptop computer is y = −0.2 x + 1. Develop a ‘C’ program to calculate after how many hours the battery power is at 75%?

```
#include <stdio.h>
int main() {
 float batteryPower = 0.75;
 float rate = -0.2;
 float hours;
 hours = (batteryPower - 1.0) / rate;
 printf("Battery power is at 75%% after %.2f hours\n", hours);
 return 0;
}
```

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

a. Compiler b.Interpreter

c. Linker d.Assembler

Correct Answer: Compiler

}

Tempe

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

a. hello7 b. “hello”7 c. “hell”8 d. hell8

"hell"8

Q 45. What is the output of following code?

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

a. 5, 5 b. 5, 5.000000

c. Garbage, 5.000000 d. Garbage, 5

Garbage, 5.000000

Q46. Which of the following is an identifier?

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

Basic_pay

Q 47. What is the output of the following program?

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

a. c1 b. cgarbage

c. 1 c. c

c1

Q48. Perform the following conversion from Decimal to other number as directeda) (365.55)10 = (?)2

b) (453.65)10 = (?)8

c) (5164.12)10 = (?)16

d) (23.65)10 = (?)5

e) (772)10 = (?)7

sol

a)(365.55)10 = (101101101.110011)2

b) (453.65)10 = (705.32)8

c) (5164.12)10 = (1434.28)16

d) (23.65)10 = (43.312)5

e) (772)10 = (1553)7

Q49. Covert the following numbers to decimal number systema) (325.54)6 = (?)10

b) (1001010110101.1110101)2 = (?)10

c) (742.72)8 = (?)10

d) (AC94.C5)16 = (?)10

sol

a) (325.54)6 ≈ (126.9444)10

b) (1001010110101.1110101)2 ≈ (4818.90625)10

c) (742.72)8 = (482.125)10

d) (AC94.C5)16 ≈ (705892.3125)10

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

(DB56.CD4)16 = (?)2, (?)8, (?)4

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

(473.42)8 = (?)2, (?)10, (?)16, (?)5

Q52. Find the value of A?

a) (23)10 = (17)A

b) (21)16 = (41)A

c) (32)8 = (101)A

?

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

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

-32766

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 41.0