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COMPUTER PROGRAMMING

ASIGNMENT 1

Q.1) Write a C program for calculating the price of a productAfter adding the sales tax to its original

price. Where rate of Tax and price is inputted by user.

Code:-

```c
#include <stdio.h>

int main()

{

Float originalPrice, taxRate, totalPrice;

// Input the original price and tax rate

Printf("Enter the original price: $");

Scanf("%f", &originalPrice);

Printf("Enter the tax rate (in percentage): ");

Scanf("%f", &taxRate);

// Calculate the total price including tax

totalPrice = originalPrice + (originalPrice * taxRate / 100);

a. // Display the total price

Printf("The total price after adding %.2f%% tax is: $%.2f\n",taxRate, totalPrice);

return 0;

}
```

Q.2) Write a C program to calculate the weekly wages of an Employee. The pay depends on wages per

hour and number ofHours worked. Moreover, if the employee has worked for more than30 hours,

then he or she gets twice the wages per hour, for everyExtra hour that he or she has worked.

Code:-

```c
#include <stdio.h>

int main()
{
Float hourlyWage, weeklyWage;

int hoursWorked;

// Input hourly wage and hours worked

Printf("Enter the hourly wage: ");

Scanf("%f", &hourlyWage);

Printf("Enter the number of hours worked: ");

Scanf("%d", &hoursWorked);

// Calculate weekly wage with overtime pay

If (hoursWorked <= 30) {

weeklyWage = hourlyWage * hoursWorked;

} else {

// Calculate regular pay for the first 30 hours

weeklyWage = hourlyWage * 30;

// Calculate overtime pay for hours worked beyond 30

weeklyWage += (hourlyWage * 2) * (hoursWorked – 30);

}

// Display the weekly wage

Printf("Weekly wage: %.2f\n", weeklyWage);

Return 0;
```

}

Q.3) Mr. X goes to market for buying some fruits andVegetables. He is having a currency of Rs 500 with

him forMarketing. From a shop, he purchases 2.0 kg Apple pricedRs. 50.0 per kg, 1.5 kg Mango priced

Rs.35.0 per kg, 2.5 kgPotato priced Rs.10.0 per kg, and 1.0 kg Tomato pricedRs.15 per kg. He gives the

currency of Rs. 500 to theShopkeeper. Find out the amount shopkeeper will returnTo X by writing a C

program.

Code:-

```c
#include <stdio.h>

int main()

{

// Define the prices per kg

Float applePrice = 50.0;

Float mangoPrice = 35.0;

Float potatoPrice = 10.0;

Float tomatoPrice = 15.0;

// Define the quantities purchased

Float appleQty = 2.0;

Float mangoQty = 1.5;

Float potatoQty = 2.5;

Float tomatoQty = 1.0;

// Calculate the total cost

Float totalCost = (appleQty * applePrice) + (mangoQty *

mangoPrice) + (potatoQty * potatoPrice) + (tomatoQty *tomatoPrice);
```

```
// Mr. X's initial currency

Float currency = 500.0;

// Calculate the amount to be returned

Float amountToReturn = currency – totalCost;

// Check if Mr. X has enough money

If (amountToReturn >= 0) {

Printf("Amount to be returned: Rs. %.2f\n",amountToReturn);

} else {

Printf("Mr. X does not have enough money to make the

Purchase.\n");

}

Return 0;
```

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

Code:-

```
#include <stdio.h>

int main()

{

printf("Name: Amal Tomar\n");

printf("Date of Birth: O3/09/2005\n");

printf("Mobile Number: 6397-33-1234\n");

return 0;

}
```

Q.5)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.

Code:-

```c
#include <stdio.h>

int main()

{

int integer;

Char character;

Float floating;

// Prompt the user to enter an integer

Printf("Enter an integer: ");

Scanf("%d", &integer);

// Prompt the user to enter a character

Printf("Enter a character: ");

Scanf(" %c", &character); // Note the space

Before %c to consume the newline character.

// Prompt the user to enter a float

Printf("Enter a float: ");

Scanf("%f", &floating);

// Display the values on separate lines

Printf("Integer: %d\n", integer);

Printf("Character: %c\n", character);

Printf("Float: %.2f\n", floating);

Return 0;

}
```

Q.6) 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.

Code:-

#include <stdio.h>

```c
Int main()
{
Double cost = 172.53;

Printf("The sales total is: $ %.2lf\n", cost);

Return 0;
}
```

Q.7) 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.

Code:-

```c
#include <stdio.h>

int main()
{
// Define the number of apples Raju got from each person

Float applesFromRaghu = 6.5;

Float applesFromSheenu = 6.5;

Float applesFromAkash = 6.5;

// Calculate the total apples Raju has

Float totalApples = applesFromRaghu + applesFromSheenu +

applesFromAkash;

// Display the total number of apples

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

Return 0;
}
```

Q.8)Write a program that prints the floating point value in Exponential format correct to two decimal

places.

Code:-

```
#include <stdio.h>

int main()

{

Double number;

// Prompt the user for input

Printf("Enter a floating-point number: ");

Scanf("%lf", &number);

// Print the number in exponential format with two decimal

Places

Printf("Exponential format: %.2e\n", number);

Return 0;

}
```

Q.9)Write a program to input and print your mobile number (i.e. of 10 digits).

Code:

```
#include <stdio.h>

int main()

{

// Declare a variable to store the mobile numberlong long int mobileNumber;

// Input the mobile number

Printf("Enter your 10-digit mobile number: ");

Scan("%lld", &mobileNumber);

// Check if the mobile number has exactly 10 digits

If (mobileNumber >= 1000000000LL &&

mobileNumber <= 9999999999LL) {
```

```
// Display the mobile number

Printf("Your mobile number is: %lld\n",

mobileNumber);

} else {

Printf("Invalid input. Please enter a 10-digit

Mobile number.\n");

}

Return 0;

}
```

Q.10) 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)

Code:-

```
#include <stdio.h>

int main() {

 Int population = 30000;

 // Increase by 20% during the first year

 Population += (population * 20) / 100;

 // Increase by 30% during the second year

 Population += (population * 30) / 100;

 Printf("Population after two years: %d\n", population);

 Return 0;

}
```

Q.11) Write a program to find the ASCII value of a character.

Code:-

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

```
int main()
{
 Char character;
 Printf("Enter a character: ");
 Scanf("%c", &character);
 int asciiValue = character;
 Printf("ASCII value of %c is %d\n", character, asciiValue);
 Return 0;
}
```

Q.12) 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.

Code:-

```
#include <stdio.h>
int main()
{
 float basicPay, hra, ta, salary;
 // Input basic pay from the user
 printf("Enter the basic pay: ");
 scanf("%f", &basicPay);
 // Calculate HRA and TA
 hra = 0.15 * basicPay;
 ta = 0.20 * basicPay;
 // Calculate the total salary
 salary = basicPay + hra + ta;
 // Display the calculated salary
 printf("Salary = %.2f\n", salary);
```

```
 return 0;

}
```

Q.13) 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.

Code:-

```
#include <stdio.h>

#include <math.h>

int main()

{

 Double xp, yp, xq, yq;

 // Input the coordinates of points P and Q

 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);

 // Calculate the slope of the line

 Double slope = (yq – yp) / (xq – xp);

 // Calculate the angle of inclination in degrees

 Double angle = atan(slope) * 180 / M_PI;

 // Display the results

 Printf("The slope of the line is: %.2lf\n", slope);

 Printf("The angle of inclination is: %.2lf degrees\n", angle);

 Return 0;

}
```

Q.14)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:

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

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.

Code:-

```c
#include <stdio.h>

int main()
{
 int k = 5; // Number of courses
 Float grades[] = {g1, g2, g3, g4, g5}; // Array of grade points for each course
 Float credits[] = {c1, c2, c3, c4, c5}; // Array of credits for each course
 Float spi = 0.0; // Initialize SPI to 0
 // Calculate SPI using the formula
 For (int I = 0; I < k; i++) {
 Spi += (grades[i] * credits[i]);
 }
 Spi /= (float)k; // Divide by the total number of courses
 Printf("SPI: %.2f\n", spi); // Print SPI with 2 decimal places
 Return 0;
}
```

Q.15) Write a program to calculate the frequency (f) of a given wave with wavelength (λ) and speed ©,

where c=λ*f.

Code:-

```c
#include <stdio.h>

int main()

{

Double wavelength, speed, frequency;

// Input the wavelength and speed

Printf("Enter the wavelength (in meters): ");

Scanf("%lf", &wavelength);

Printf("Enter the speed (in meters per second): ");

Scanf("%lf", &speed);

// Calculate the frequency

Frequency = speed / wavelength;

// Display the result

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

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]

Code:-

```c
#include <stdio.h>

#include <math.h>

int main()

{

Double initial_velocity = 30.0; // initial velocity in m/s

Double acceleration = 5.0; // acceleration in m/s^2
```

Double distance = 70.0; // distance in meters

// Calculate the final velocity using the formula

Double final_velocity = sqrt(pow(initial_velocity, 2) + 2 * acceleration * distance);

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

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]

Code:-

```
#include <stdio.h>

int main() {

// Given values

Float initial_velocity = 0; // Initial velocity in m/s

Float acceleration = 4; // Acceleration in m/s^2

Float time = 3; // Time in seconds

// (a) Calculate final velocity

Float final_velocity = initial_velocity + (acceleration * time);

// (b) Calculate distance traveled

Float distance_traveled = (initial_velocity * time) + (0.5 * acceleration * time * time);

// Display the results

Printf("Final velocity: %.2f m/s\n", final_velocity);

Printf("Distance traveled: %.2f meters\n", distance_traveled);

Return 0;

}
```

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

Code:-

```c
#include <stdio.h>

int main()
{
 int rollNumber = 12345678; // Replace with your roll number
 int lastFourDigits = rollNumber % 10000; // Extract the last four digits
 int sum = 0;
 // Calculate the sum of the last four digits
 While (lastFourDigits > 0) {
 Sum += lastFourDigits % 10;
 lastFourDigits /= 10;
 }
 Printf("Sum of the last four digits of your roll number is: %d\n", sum);
 Return 0;
}
```

Q.19) 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.

Code:-

```c
#include <stdio.h>
// Constants for conversion factors
#define CM_TO_INCH 0.393701
#define KG_TO_POUND 2.20462
```

```
int main() {

// Initialize height in centimeters and weight in kilograms

Double height_cm = 175.0; // Replace with your height in cm

Double weight_kg = 70.0; // Replace with your weight in kg

// Convert height and weight to feet and pounds

Double height_inch = height_cm * CM_TO_INCH;

Double weight_pound = weight_kg * KG_TO_POUND;

// Display the converted values

Printf("Height: %.2f cm = %.2f inches\n", height_cm, height_inch);

Printf("Weight: %.2f kg = %.2f pounds\n", weight_kg, weight_pound);

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

Code:-

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;
```

Q.21) Write a program that reads nine integers. Display these numbers by printing three numbers in a

line separated by commas.

Code:-

```c
#include <stdio.h>

int main() {

int numbers[9];

// Read nine integers

Printf("Enter nine integers:\n");

For (int I = 0; I < 9; i++) {

Scanf("%d", &numbers[i]);

}

// Display the numbers in groups of three

Printf("Numbers in groups of three separated by commas:\n");

For (int I = 0; I < 9; i++) {

Printf("%d", numbers[i]);

If ((I + 1) % 3 == 0) {

// Print a comma and a newline after every third number

Printf(",\n");

} else {

// Print just a comma and a space for other numbers

Printf(", ");

}

}

Return 0;

}
```

Q.22) What are header files and what are its uses in C programming?

Ans:-

Header files in C programming are files that contain declarations of functions, variables, and other

constructs that are used in a program but are defined in other source files. They typically have a `.h`

extension and are included in C source code files using the `#include` preprocessor directive.

The main uses of header files In C programming are:

1. **Modularity**: Header files help in organizing code into modules. By separating the

declarations in header files, you can create a clear interface for a module, allowing other parts of

the program to use the module's functionality without needing to know the implementation

details.

2. **Code Reusability**: Header files enable you to reuse code across different parts of your

program or even in different programs. When you include a header file, you can use the

functions and variables declared in that file without rewriting them.

3. **Encapsulation**: Header files allow you to encapsulate the implementation details of a

module, providing an abstract view of the module's functionality. This helps in hiding the internal

complexity and protects the module from unwanted external access.

4. **Avoiding Redundancy**: Including a header file in multiple source files ensures that the

declarations are consistent across the program. This avoids redundancy and potential errors that

might occur if you manually redeclare functions and variables in multiple places.

5. **Compile-Time Checking**: Header files are checked by the C compiler during the compilation

process. This helps in catching errors and ensuring that functions are called with the correct

arguments and return types.

Common header files in C include `<stdio.h>` for input/output functions, `<stdlib.h>` for standard library

functions, `<math.h>` for mathematical functions, and many others.

By convention, you include header files at the beginning of your source files to make the declarations

available for use in the rest of the code. For example:

```c
#include <stdio.h>

int main() {

 Printf("Hello, World!\n");

 Return 0;

}
```

In this example, `<stdio.h>` is included to access the `printf` function's declaration, allowing it to be used

in the `main` function.

Q.23) 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:-

 The output of this program will be: 56 70 38.

These are the decimal, octal, and hexadecimal representations of the number 56, respectively.

Q.24) What will be the output of following program?

```c
#include <stdio.h>
Void main()
{
Int x = printf("GLA UNIVERSITY");
 Printf("%d", x);
 }
```

Output:-

 The program will output:

 GLA UNIVERSITY14

Q.25)What are library functions? List any four library functions.

Ans:-

 Library functions in C are pre-defined functions that are provided by the C standard library and can be

used in C programs without the need for writing the actual code for these functions. They serve various

purposes and simplify programming tasks. Here are four commonly used library functions in C:

1. **printf():** This function is used for formatted output. It allows you to display text and values

on the console with various formatting options.

2. **scanf():** scanf() is used for formatted input. It allows you to read input from the user or from

a file in a specified format.

3. **strlen():** This function is used to find the length of a string. It takes a string as input and

returns the number of characters in that string.

4. **rand():** rand() generates a pseudo-random number. It can be used to produce random

integers within a specified range.

To use these functions in your C program, you need to include the appropriate header files, such as

`<stdio.h>` for printf() and scanf(), `<string.h>` for strlen(), and `<stdlib.h>` for rand().

Q.26) 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:-

 The output will be:

 30 36 1e

•30 is the decimal representation of x.

•36 is the octal representation of x (30 in octal is 36 indecimal).

•1e is the hexadecimal representation of x (30 in hexadecimal is 1e in decimal).

Q.27) What is the meaning of following statement?
Printf("%d",scanf("%d%d",&a,&b));

Ans:-

 The statement `printf("%d", scanf("%d%d", &a, &b));` is a combination of the `printf` and `scanf`

functions in the C programming language. Let's break it down:

1. `scanf("%d%d", &a, &b)` is used to read input from the user. It expects two integer values to be

entered by the user and assigns them to the variables `a` and `b`. The `%d` format specifier is

used to indicate that integer values are expected.

2. The `scanf` function returns the number of successfully read items, which in this case would be 2

if both integers are successfully read and assigned.

3. Finally, `printf("%d", …)` is used to print a value. In this case, it's printing the result of the `scanf`

function. So, it will print the number of successfully read items, which could be 2 if the user

enters two integers correctly.

In summary, this statement will prompt the user to enter two integers, and then it will print the number

2 (indicating that two items were successfully read) using `printf`.

Q.28) What will be the output of following program?

#include <stdio.h>

Void main()

{

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

}

Output:-

 The given C program will print the following output:

 "C % FOR % PLACEMENT"

Q.29) 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.

Code:-

 #include <stdio.h>

```
int main()
{
Double distance, time, speed;
// Get distance from the user in kilometers
Printf("Enter the distance between GLA University and Delhi (in kilometers): ");
Scanf("%lf", &distance);
// Time taken to reach Delhi in hours
Time = 4.0;
// Calculate speed (speed = distance / time)
Speed = distance / time;
// Display the speed of the bus
Printf("The speed of the bus is %.2lf km/h.\n", speed);
Return 0;
}
```

Q.30) 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.

Code:-

```
#include <stdio.h>
int main()
{
// Define variables to store marks
Int satyam_marks = 50;
Int suman_marks = 70;
Int shyam_marks = 80;
// Calculate the sum of marks
Int total_marks = satyam_marks + suman_marks + shyam_marks;
```

```c
// Calculate the average

Float average_marks = (float)total_marks / 3;

// Display the average marks

Printf("The average marks of Satyam, Suman, and Shyam is: %.2f\n", average_marks);

Return 0;

}
```

Q.31) 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.

Code:-

```c
#include <stdio.h>

int main() {

// Declare variables to store the money given to Saurav and Sajal

Float moneyToSaurav, moneyToSajal, temp;

// Input the initial amounts

Printf("Enter the money given to Saurav: ");

Scanf("%f", &moneyToSaurav);

Printf("Enter the money given to Sajal: ");

Scanf("%f", &moneyToSajal);

// Swap the amounts using a temporary variable

Temp = moneyToSaurav;

moneyToSaurav = moneyToSajal;

moneyToSajal = temp;

// Display the corrected amounts
```

Printf("After swapping, the money given to Saurav is: %.2f\n", moneyToSaurav);

Printf("After swapping, the money given to Sajal is: %.2f\n", moneyToSajal);

Return 0;

}

Q.32) 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.

Code:-

```c
#include <stdio.h>
int main()
{
Float speed_kmph = 4.0; // Speed in kilometers per hour
Float time_minutes = 3.0; // Time in minutes
// Convert time from minutes to hours
Float time_hours = time_minutes / 60.0;
// Calculate the distance in kilometers
Float distance_km = speed_kmph * time_hours;
Printf("You traveled %.2f kilometers.\n", distance_km);
Return 0;
}
```

Q.33) Can two or more escape sequences such as \n and \t be combined in a single line of program

code?

Ans:-

Yes, you can combine multiple escape sequences in a single line of C code. For example, you can create

a string with both newline (`\n`) and tab (`\t`) escape sequences like this:

```c
Printf("Hello\n\tWorld");
```

This code would output:

```
Hello
 World
```

So, combining escape sequences in a single line of code is a common practice in C for formatting output

or creating special characters within strings.

Q.34) What are the Comments and how do you insert it in a C Program?

Ans:-

In C programming, comments are text annotations that are not executed as part of the program but

provide helpful information for programmers or anyone reading the code. Comments are used to explain

the purpose of code, provide documentation, or make notes within the source code.

There are two common ways to insert comments in a C program:

1. Single-Line Comments:

To add a comment on a single line, you can use double forward slashes (`//`). Anything following `//` on

the same line is considered a comment and is ignored by the compiler. For example:

```c
// This is a single-line comment

Int x = 5; // This comment explains the variable assignment
```

2. Multi-Line Comments:

For longer comments that span multiple lines, you can use a pair of forward slash and asterisk (`/*`) to

begin the comment and a pair of asterisk and forward slash (`*/`) to end it. Everything between `/*` and

`*/` is treated as a comment. For example:

```c
/*
This is a multi-line comment.

It can span multiple lines.

*/

Int y = 10;
```

Comments are essential for making code more readable and understandable, and they help other

programmers (or even your future self) comprehend the purpose and logic of the code you've written.

Q.35) What is wrong in this statement? Scanf("%d",number);

Ans:-

The statement `scanf("%d", number);` has a formatting issue. The `scanf` function is used to read input

from the user, and it requires a pointer to the variable where the input should be stored. In this case, it

seems like you want to read an integer and store it in the variable `number`, but you need to pass a

pointer to `number` instead of `number` itself.

Here's the corrected statement:

```c
Scanf("%d", &number);
```

By using `&number`, you pass a pointer to the memory location of the `number` variable, allowing

`scanf` to store the input value there.

Q.36) What will be the output?

```c
#include <stdio.h>

int main()

{

 If (sizeof(int) > -1)

 Printf("Yes");

 Else

 Printf("No");

 Return 0;

}
```

Output:-

The output of this program will be:

 "Yes"

Q.37) Point out which of the following variable names are invalid:

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

Ans:-

 Here are the invalid variable names:

1. gross-salary (Variable names cannot contain hyphens; use underscores or camelCase instead)

2. avg. (Variable names cannot contain periods; use letters and underscores)

3. thereisbookinmysoup (This variable name is valid)

So, "gross-salary" and "avg." are invalid variable names.

Q.38) 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.

Code:-

```
#include <stdio.h>
int main() {
// Define the variables
Float tankSize = 175.0; // gallons
Float drainRate = 25.0; // gallons per hour
Float timeRequired;
// Calculate the time required to drain the tank
timeRequired = tankSize / drainRate;
// Display the result
Printf("To completely clean the tank, it will take %.2f hours.\n", timeRequired);
Return 0;
```

}

Q.39) 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%?

Code:-

```
#include <stdio.h>
int main()
{
Float y = 0.75; // 75% battery power
Float x;
// Solve for x using the equation y = -0.2x + 1
X = (1 – y) / -0.2;
Printf("It takes %.2f hours for the battery power to reach 75%%\n", x);
Return 0;
}
```

Q.40) 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:-

a. Compiler

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

a.%0   b.%d

c. %o   d. %e

Ans:-

c. %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

Ans:-

d. %.2e

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

a. char

b. array

c. float

d. int

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."hell8"

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:-

c.Garbage,5.000000

Q.46) Which of the following is an identifier?

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

Ans:-

b.Basic_pay,

c.enum

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.c1

Q.48) 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. $(772)_{10} = (?)_7$

Ans:-

 The conversions are:

a. $(365.55)_{10} = (101101101.1000110011)_2$

b. $(453.65)_{10} = (705.5146)_8$

c. $(5164.12)_{10} = (143C.1A3D70A3D70A3D70...)_{16}$

d. $(23.65)_{10} = (43.4213)_5$

e. $(772)_{10} = (1612)_7$

Q.49) Covert the following numbers to decimal number systema. $(325.54)_6 = (?)_{10}$

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

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

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

Ans:-

To convert numbers from different number systems to decimal, you can use the following methods:

a. $(325.54)_6$ to decimal:

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

 $(3 * 6^2) + (2 * 6^1) + (5 * 6^0) + (5 * 6^{(-1)}) + (4 * 6^{(-2)})$

 Calculating this gives you:

 $(3 * 36) + (2 * 6) + (5 * 1) + (5/6) + (4/36) = 108 + 12 + 5 + 0.8333 + 0.1111 = 125.9444$

So, (325.54)6 is approximately equal to (125.9444)10.

b. (1001010110101.1110101)2 to decimal:

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

(1 * 2^12) + (0 * 2^11) + (0 * 2^10) + (1 * 2^9) + (0 * 2^8) + (1 * 2^7) + (0 * 2^6) + (1 * 2^5) + (1 * 2^4)

+ (0 * 2^3) + (1 * 2^2) + (0 * 2^1) + (1 * 2^0) + (1 * 2^(-1)) + (1 * 2^(-2)) + (1 * 2^(-3)) + (0 * 2^(-4)) + (1 *

2^(-5))

Calculating this gives you:

4096 + 0 + 0 + 512 + 0 + 128 + 0 + 32 + 16 + 0 + 4 + 0 + 1 + 0.5 + 0.25 + 0.125 + 0 + 0.03125 =

4723.90625

So, (1001010110101.1110101)2 is approximately equal to (4723.90625)10.

c. (742.72)8 to decimal:

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

(7 * 8^2) + (4 * 8^1) + (2 * 8^0) + (7 * 8^(-1)) + (2 * 8^(-2))

Calculating this gives you:

(7 * 64) + (4 * 8) + (2 * 1) + (7/8) + (2/64) = 448 + 32 + 2 + 0.875 + 0.03125 = 482.90625

So, (742.72)8 is approximately equal to (482.90625)10.

d. (AC94.C5)16 to decimal:

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

(A * 16^3) + (C * 16^2) + (9 * 16^1) + (4 * 16^0) + (C * 16^(-1)) + (5 * 16^(-2))

Calculating this gives you:

(10 * 4096) + (12 * 256) + (9 * 16) + (4 * 1) + (12/16) + (5/256) = 40960 + 3072 + 144 + 4 + 0.75 +

0.01953125 = 44280.76953125

So, (AC94.C5)16 is approximately equal to (44280.76953125)10.

Q.50) Perform the following conversion from Hexadecimal to other number as directed-

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

Ans:-

To convert the hexadecimal number $(DB56.CD4)_{16}$ to other bases:

1. Binary (base 2):

$(DB56.CD4)_{16}$ = $(1101101101010110.110011010100)_2$

2. Octal (base 8):

To convert from binary to octal, group the binary digits into sets of three, starting from the binary

point:

$(1101101101010110.110011010100)_2$ = (011 011 011 010 101 101 011 011 010 100)₂

Now, convert each group of three binary digits to octal:

(011 011 011 010 101 101 011 011 010 100)₂ = $(333 255 333 332 244)_8$

3. Quaternary (base 4):

To convert from binary to quaternary, group the binary digits into sets of two, starting from the binary

point:

$(1101101101010110.110011010100)_2$ = (11 01 10 11 01 01 10 11 01 01 00)₂

Now, convert each group of two binary digits to quaternary:

(11 01 10 11 01 01 10 11 01 01 00)₂ = $(33 13 22 33 13 22)_4$

So, $(DB56.CD4)_{16}$ is equal to $(1101101101010110.110011010100)_2$ in binary, $(333 255 333 332 244)_8$ in

octal, and $(33 13 22 33 13 22)_4$ in quaternary.

Q.51) Perform the following conversion from octal to other number as directed-

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

Ans:-

To convert the octal number (473.42)8 to different number systems, you can follow these steps:

1. Binary (base 2):

(473.42)8 = (100111011.100)2

3. Decimal (base 10):

To convert from octal to decimal, you can use the positional notation. Starting from the right, the

positions are powers of 8 (8^0, 8^1, 8^2, and so on). Calculate the decimal equivalent as follows:

(473.42)8 = 2 * 8^(-1) + 4 * 8^0 + 3 * 8^1 + 7 * 8^2 + 4 * 8^(-2) = 123.25

4. Hexadecimal (base 16):

To convert from octal to hexadecimal, first convert it to binary and then group the binary digits into

sets of four, starting from the binary point:

(100111011.100)2 = (1001 1101.1000)2

Now, convert each group of four binary digits to a hexadecimal digit:

1001 1101.1000 = 9D.8

So, (473.42)8 = (9D.8)16

5. Quintal (base 5):

To convert from octal to quintal, first convert it to decimal (which we did in step 2), and then convert

the decimal number to quintal. Here's the conversion of 123.25 to quintal:

123.25 (in decimal) can be represented as 4 * 5^0 + 2 * 5^1 + 3 * 5^2 + 1 * 5^3 + 2 * 5^(-1).

Calculate the quintal representation:

123.25 (decimal) = (3214.2)5

So, the conversions are as follows:

- Binary: (473.42)8 = (100111011.100)2

- Decimal: (473.42)8 = 123.25

- Hexadecimal: (473.42)8 = (9D.8)16

- Quintal: (473.42)8 = (3214.2)5

Q.52) Find the value of A?

a. (23)10 = (17)A

b. (21)16 = (41)A

c. (32)8 = (101)A

Ans:-

To find the value of A in each of these equations, we can set up equations and solve for A:

a. (23)10 = (17)A

Here, we have a base-10 number (23) equal to a base-A number (17). We can set up the equation:

23 = 1*A + 7

Now, subtract 7 from both sides:

16 = A

So, A = 16.

b. (21)16 = (41)A

In this equation, we have a base-16 number (21) equal to a base-A number (41). Let's set up the

equation:

21 = 4*A + 1

Now, subtract 1 from both sides:

20 = 4*A

Divide both sides by 4:

A = 5

So, A = 5.

c. (32)8 = (101)A

In this equation, we have a base-8 number (32) equal to a base-A number (101). Set up the equation:

32 = 1*A^2 + 0*A + 1

32 = A^2 + 1

Subtract 1 from both sides:

31 = A^2

Take the square root of both sides:

A = ±√31

So, A can be either √31 or -√31.

Q.53) What will be the output of following program? Assume integer is of 2 bytes

Void main(){

Int a=32770;

Printf("%d",a);

}

Output:-

Output is Unpredictable.

Q.54) #include <stdio.h>

Int main()

{

Float c = 5.0;

Printf ("Temperature in Fahrenheit is %.2f", (9/5)*c + 32);

Return 0;

}

Output:-

Temperature in Fahrenheit is 37.00

 FINISHED……..