No: 2023/7/12. Date:

# Tute (10)

(1) Briefly explain Greatest Common Devisor (GCD)

The greatest common divisor of two numbers is the largest number that divide them both, without any remainder value. Also known as the Highest common Factor (HCF).

(2) Explain the steps of the euclidean algorithm,

If A=0 then GCD (A,B) = B. since the GCD (0, B) = B and we can stop.

If B=0 then GCD (A,B) = A, since the GCD (A, 0) = A and we can stop.

Write A in quotient remainder form (A = B.Q + R),

Find GCD (B, R) using the euclidean algorithm since GCD (A,B) = GCD (B,R)

(num1, num2) ⇒ GCD (num2, GCD (num1 % num2)

(3) What is defined by prime factorization.

Prime factorization is a method to find the prime factors of a given number say a composite number.

(4) Write a function using pseudo or source code to find out the GCD using recursively.

```
Public class RecursiveGCD {
    Public static void main (String [] args)
    {
        int num 1 = 120 ;
        int num 2 = 35 ;
        System.out.print ("GCD (" + num + ", " + num2 +
        System.out.print (gcd (num1, num2));
    }
```

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```
Public static int gcd (int num1, int num2)
{
    if (num2 == 0)
    {
        return num1;
    }
    return gcd (num2, num1 % num2);
}
}.
```

(5) Try to use the interation to get the same results.

```
Public class IterativeGCD
{
    public static void main (String[] args)
    int num1 = 120;
    int num2 = 35;
    System.out.print ("GCD (" + num1 + ", " + num2 + ") = ");
    System.out.print (gcd (num1, num2));
}
    public static int gcd (int num1, int num2)
    {
        While (num2 != 0)
        {
            int temp = num1 % num2;
            num1 = num2;
            num2 = temp;
        }
        return num1;
}.
```

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(6) Graphically represent how to identify the prime factorization.

Ex :-