**Ex.No. : 2(a)** **RSA ALGORITHM**
**Date :**

**AIM:**

To implement a RSA algorithm using HTML and Javascript.

**ALGORITHM:**

1. Choose two prime number p and q.
2. Compute the value of n and t.
3. Find the value of public key e.
4. Compute the value of private key d.
5. Do the encryption and decryption
   a. Encryption is given as,
      $c = t^e \bmod n$
   b. Decryption is given as,
      $t = c^d \bmod n$

**PROGRAM:**

***rsa.html***

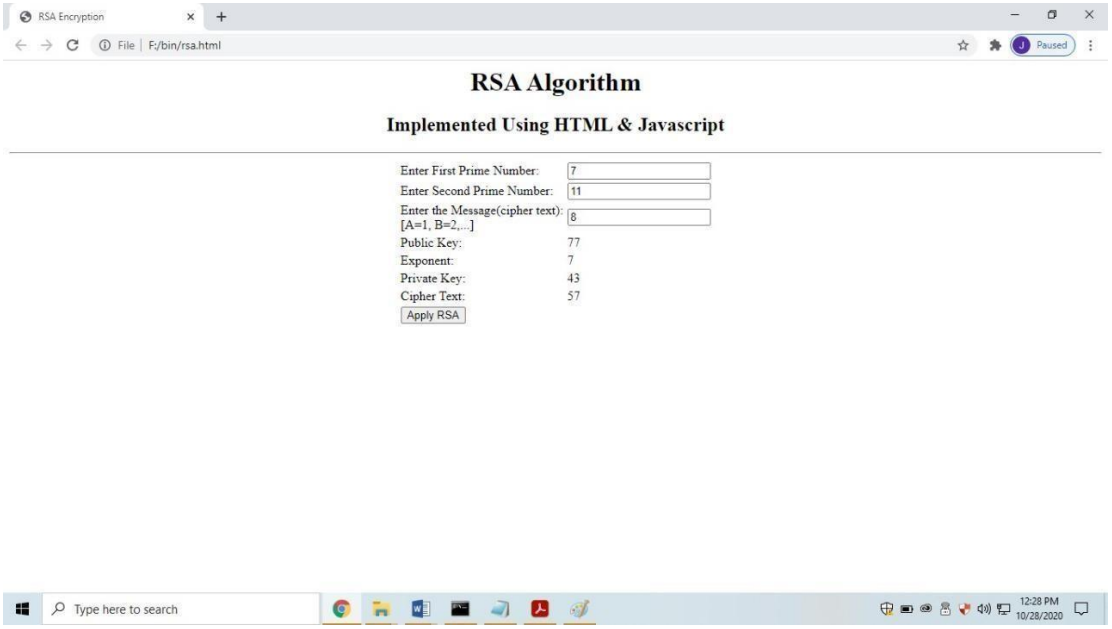
```
<html>
<head>
  <title>RSA Encryption</title>
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
</head>
<body>
  <center>
    <h1>RSA Algorithm</h1>
    <h2>Implemented Using HTML & Javascript</h2>
    <hr>
    <table>
      <tr>
        <td>Enter First Prime Number:</td>
        <td><input type="number" value="53" id="p"></td>
      </tr>
      <tr>
        <td>Enter Second Prime Number:</td>
        <td><input type="number" value="59" id="q"></p> </td>
      </tr>
      <tr>
        <td>Enter the Message(cipher text):<br>[A=1, B=2,...]</td>
        <td><input type="number" value="89" id="msg"></p> </td>
      </tr>
      <tr>
        <td>Public Key:</td>
        <td><p id="publickey"></p> </td>
      </tr>
      <tr>
        <td>Exponent:</td>
        <td><p id="exponent"></p> </td>
      </tr>
```

```
            <tr>
                <td>Private Key:</td>
                <td><p id="privatekey"></p></td>
            </tr>
            <tr>
                <td>Cipher Text:</td>
                <td><p id="ciphertext"></p> </td>
            </tr>
            <tr>
                <td><button onclick="RSA();">Apply RSA</button></td>
            </tr>
        </table> </center>
</body>
<script type="text/javascript">

function RSA()
{
        var gcd, p, q, no, n, t, e, i, x;
        gcd = function (a, b) { return (!b) ? a : gcd(b, a % b); };
        p = document.getElementById('p').value;
        q = document.getElementById('q').value;
        no = document.getElementById('msg').value;
        n = p * q;
        t = (p - 1) * (q - 1);
        for (e = 2; e < t; e++)
        {
            if (gcd(e, t) == 1)
            {
                break;
            }
        }
        for (i = 0; i < 10; i++)
        {
            x = 1 + i * t
            if (x % e == 0)
            {
                d = x / e;
                break;
            }
        }
        ctt = Math.pow(no, e).toFixed(0);
        ct = ctt % n;
        dtt = Math.pow(ct, d).toFixed(0);
        dt = dtt % n;
        document.getElementById('publickey').innerHTML = n;
        document.getElementById('exponent').innerHTML = e;
        document.getElementById('privatekey').innerHTML = d;
        document.getElementById('ciphertext').innerHTML = ct;
    }
</script>
```

</html>

**OUTPUT:**




**RESULT:**

Thus the RSA algorithm was implemented using HTML and Javascript and executed successfully.