MULTIPLICATION

Multiply ( ):

Description: Here **A** is a two – dimensional array with **M** rows and **N** columns and **B** is a two – dimensional array with **X** rows and **Y** columns. This algorithm multiplies these two arrays.

```
1.    If (M ≠ Y) or (N ≠ X) Then
2.          Print: Multiplication is not possible.
3.    Else
4.        Repeat For I = 1 to N
5.            Repeat For J = 1 to X
6.                Set C[I][J] = 0
7.                Repeat For K = 1 to Y
8.                    Set C[I][J] = C[I][J] + A[I][K] * B[K][J]
                  [End of Step 7 For Loop]
              [End of Step 5 For Loop]
          [End of Step 4 For Loop]
      [End of If]
9.    Exit
```

Explanation: First we check whether the rows of A are equal to columns of B or the columns of A are equal to rows of B. If they are not equal, then multiplication is not possible. But, if they are equal, the first for loop iterates to total number of columns of A i.e. N and the second for loop iterates to the total number of rows of B i.e. X. In step 6, all the elements of C are set to zero. Then the third for loop iterates to total number of columns of B i.e. Y. In step 8, the element A[I][K] is multiplied with B[K][J] and added to C[I][J] and the result is assigned to C[I][J] by the statement:

$$C[I][J] = C[I][J] + A[I][K] * B[K][J]$$