```cpp
1: #include <iostream>
2: using namespace std;
3:
4: int main()
5: {
6:     int number, product=1;
7:
8:     cout << "Enter an integer number: ";
9:     cin >> number;
10:
11:
12:     do
13:     {
14:         product *= (number % 10);
15:         cout << number % 10;
16:         number = number / 10;
17:
18:         if (number!=0)
19:         {
20:             cout << " * ";
21:         }
22:
23:         else
24:         {
25:             cout << " = " << product << endl;
26:         }
27:
28:     }
29:     while (number !=0);
30:
31:     if (product % 2 == 0)
32:         {
33:         cout << product << " is an even number " ;
34:         }
35:     else
36:         {
37:         cout << product << " is an odd number " ;
38:         }
39:
40:
41:     if ((product % 3 == 0) && (product % 5 == 0))
42:         {
43:         cout << "& multiples of 3 and 5" << endl;
44:         }
45:
46:     else if (product % 3 == 0)
47:         {
48:         cout << "& multiples of 3" << endl;
49:         }
50:
```

```cpp
51:        else if (product % 5 == 0)
52:            {
53:            cout << "& multiples of 5 " << endl;
54:            }
55:
56:
57: return 0;
58: }
```