Computer
ECE 001

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(at Shoubra)

Sheet 1 - Sol

You need to keep an eye on the formal definition of *algorithm*:

> "*An algorithm is an* ***ordered*** *set of* ***unambiguous***, ***executable*** *steps that defines a* ***terminating*** *process.*"

I

- **5.4**
  Let the students come up with their own examples from whatever domain they prefer.

- **5.5**
  No, it does not represent an algorithm in the strict sense.
  Because the process described will never terminate as the value of `Count` will never be `5`.

- **5.6**
  The three steps do not constitute an algorithm because `Step 3` is not executable as the two line segments drawn in the two previous steps do not intersect.

- **5.7**

```
Count ← 2;
repeat {
    print Count;
    Count ← Count + 1;
} until (Count ≥ 7)
```

- **5.13**
  Pseudocode is a relaxed version of a programming language used to jot down ideas. A *formal programming language* prescribes strict rules of grammar that must be obeyed.

- **5.27**
  Identify the termination condition in each of the following iterative statements:
  a) `Count ≥ 5`
  b) `Count = 1`
  c) `(Count ≥ 5) or (Total ≥ 56)`

- **5.28**
  The body of the loop is {`print Count; Count ← Count + 3;`} and it will be executed twice.
  If the test is changed to (`Count ≠ 6`), the body will be executed infinitely.

II

Given

```
Count ← 0;
while (Count < 10) do {
    print Count;
    Count ← Count + 1;
}
```

a)

```
Count ← 0;
while (Count < 10) do {
    print 9 – Count;
    Count ← Count + 1;
}
```

b)

```
Count ← 0;
while (Count < 10) do {
    print Count;
    Count ← Count + 2;
}
```

c)

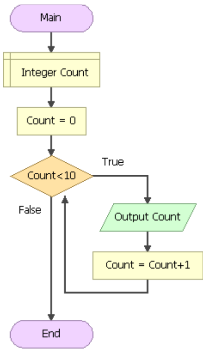
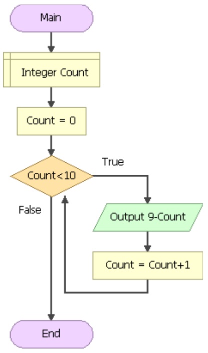
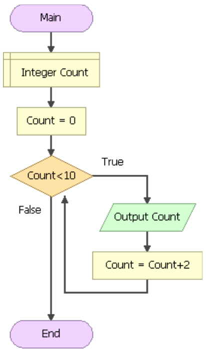
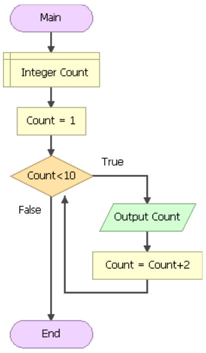
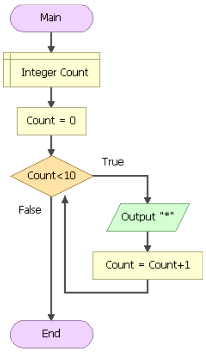
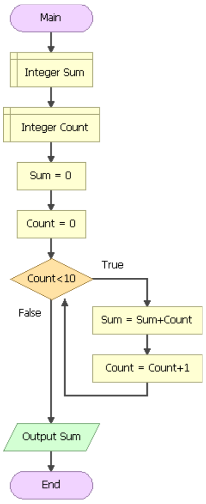
```
Count ← 1;
while (Count < 10) do {
    print Count;
    Count ← Count + 2;
}
```

d)

```
Count ← 0;
while (Count < 10) do {
    print "*";
    Count ← Count + 1;
}
```

e)

```
Sum ← 0;
Count ← 0;
while (Count < 10) do {
    Sum ← Sum + Count;
    Count ← Count + 1;
}
print Sum;
```

Given	a)	b)	c)	d)	e)
 Main Integer Count Count = 0 Count<10 True False Output Count Count = Count+1 End	 Main Integer Count Count = 0 Count<10 True False Output 9-Count Count = Count+1 End	 Main Integer Count Count = 0 Count<10 True False Output Count Count = Count+2 End	 Main Integer Count Count = 1 Count<10 True False Output Count Count = Count+2 End	 Main Integer Count Count = 0 Count<10 True False Output "*" Count = Count+1 End	 Main Integer Sum Integer Count Sum = 0 Count = 0 Count<10 True False Sum = Sum+Count Count = Count+1 Output Sum End