①

Ⓐ is 20 in it?   Ⓑ is 175?

$$\boxed{no} \qquad \boxed{no}$$

$S = \{1, 3, 7, 15, 31, 63, 127, 255\}$

this is what is contained ↑

②

$S = \{a, abc, abcbc, abcbcbc,\}$

③

$S = \{3, 3, 3 \ldots\} = \bar{3}$ to infinity

④ $\{7, 17, 27, 37, 47 \ldots\}$

a) $7 \in S$ and if $n \in S$, then $n+10 \in S$

⑤

$\{ca, cb, cc, caa, cab, cac, cba, cbb, cbc, cca, ccb, ccc,$

$caba, cabb, cabc, caca, cacb, cacc, cbaa, cbab, cbac,$

$cbba, cbbb, cbbc, cbca, cbcb, cbcc, \ldots\}$

S consists of strings begining with c with then 3 possibilites of [a,b,c] for each of the next position. every possibility is contained from only 1 type of letter in the string to all different (up to 3 characters then it will repeat)

(6) $(1,2)$, $\overset{\text{and}}{(3,2)}$, $(1,4), (2,3))$, $(5,2)$

$(2,1)$, $((4,1), (2,3), (3,2))$,

from the ordered pair $(1,2)$ and $(2,1)$ in the form (m,n) there is a pair with $m+2, n+1$, and $m+1$ with $n+1$.

Yes, this is contained as every possibility will be contained up to that number.