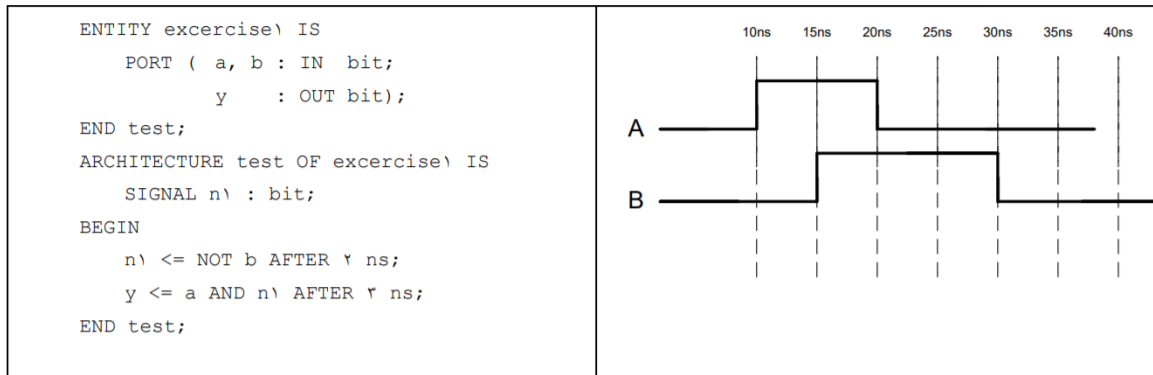


Event ها در بخش transaction ها با قرمز مشخص شده اند.

۱. Sketch the waveform of the output and internal signals.

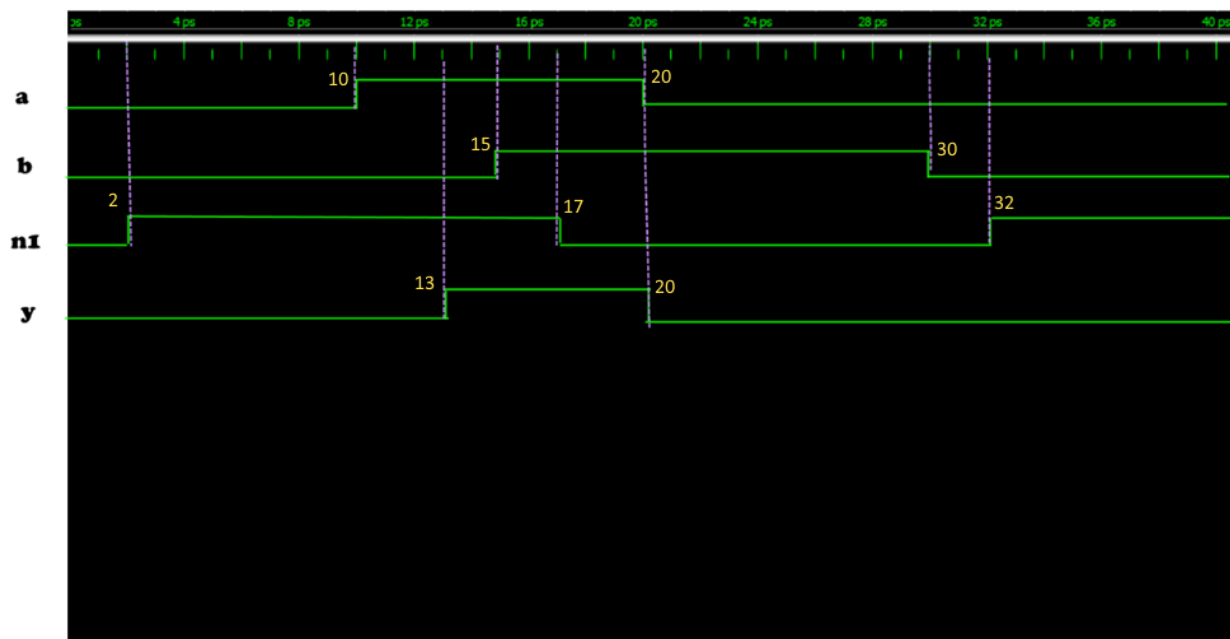


a(0) : ('1',10ns), ('0', 20ns)

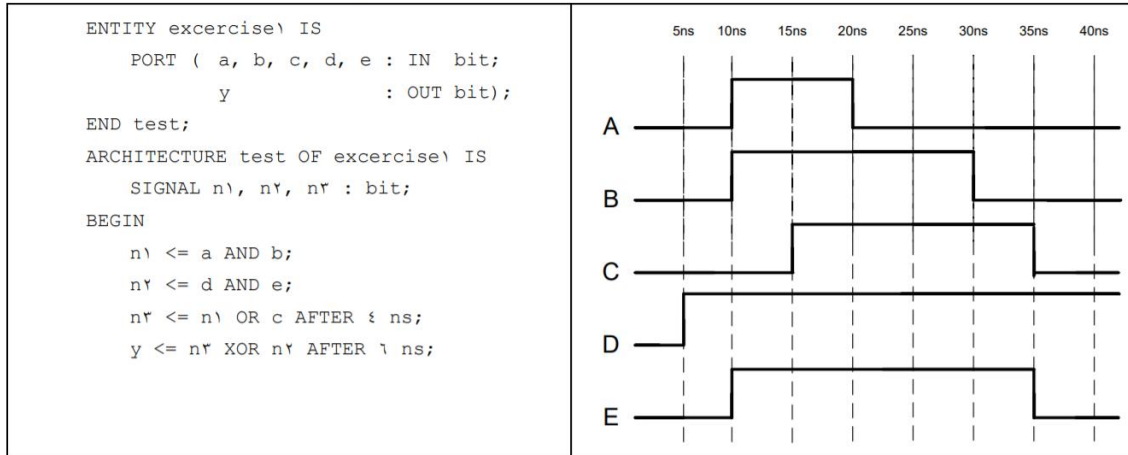
b(0) : ('1',15ns), ('0', 30ns)

n1(0) : ('1', 2ns), ('0', 17ns), ('1',32ns)

y(0) : ('0', 3ns), ('0', 5ns), ('1', 13ns), ('0', 20ns), ('0' 23ns), ('0',35 ns)



۲. Sketch the waveform of the output and internal signals.



a(0) : ('1', 10ns), ('0', 20ns)

b(0) : ('1', 10ns), ('0', 30ns)

c(0) : ('1', 15ns), ('0', 35ns)

d(0) : ('1', 5ns)

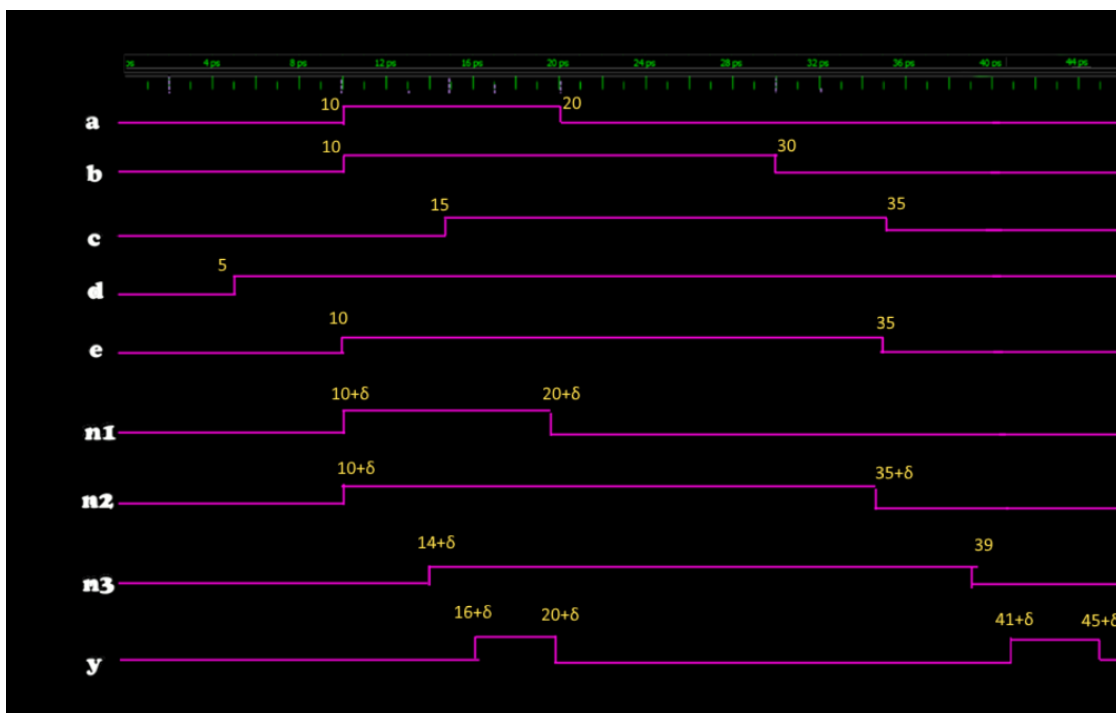
e(0) : ('1', 10ns), ('0', 35ns)

n1(0) : ('0', 0ns+ $\delta$ ), ('1', 10ns+ $\delta$ ), ('0', 20ns+ $\delta$ ), ('0', 30ns+ $\delta$ )

n2(0) : ('0', 0ns+ $\delta$ ), ('0', 5ns+ $\delta$ ), ('1', 10ns+ $\delta$ ), ('0', 35ns+ $\delta$ )

n3(0) : ('0', 4ns), ('1', 14ns+ $\delta$ ), ('1', 19ns), ('1', 24ns+ $\delta$ ), ('0', 39ns)

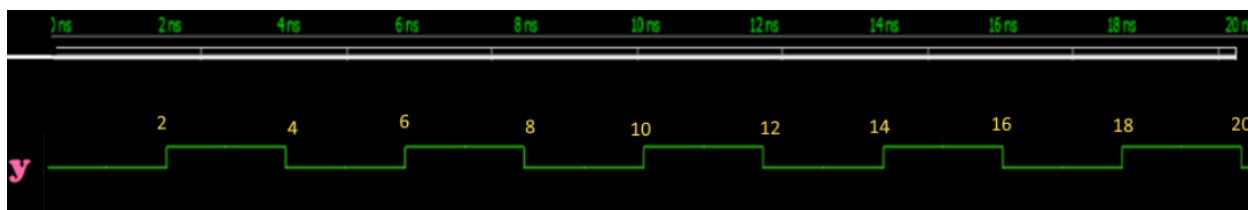
y(0) : ('0', 6ns), ('1', 16ns+ $\delta$ ), ('0', 20ns+ $\delta$ ), ('1', 41ns+ $\delta$ ), ('0', 45ns+ $\delta$ )



۳. Sketch the waveform of the output and internal signals.

```
ENTITY excercise۳ IS END test;
ARCHITECTURE test OF excercise۳ IS
    SIGNAL y : bit;
BEGIN
    y <= NOT y AFTER ۲ ns;
END test;
```

$y(0) : ('1', 2ns), ('0', 4ns), ('1', 6ns), ('0', 8ns), \dots, ('1', 4K-2 ns), ('0', 4K ns) \ K \subseteq N$



۴. Sketch the waveform of the output and internal signals.

```
ENTITY excercise۴ IS END test;
ARCHITECTURE test OF excercise۴ IS
    SIGNAL y : bit;
BEGIN
    y <= NOT y;
END test;
```

$y(0) : ('1', 0 ns + 1\delta), ('0', 0ns + 2\delta), ('1', 0ns + 3\delta), ('0', 0ns + 4\delta), \dots, ('1', 0ns + (2K-1)\delta), ('0', 0ns + 2K\delta) \ K \subseteq N$

