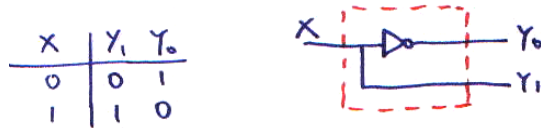
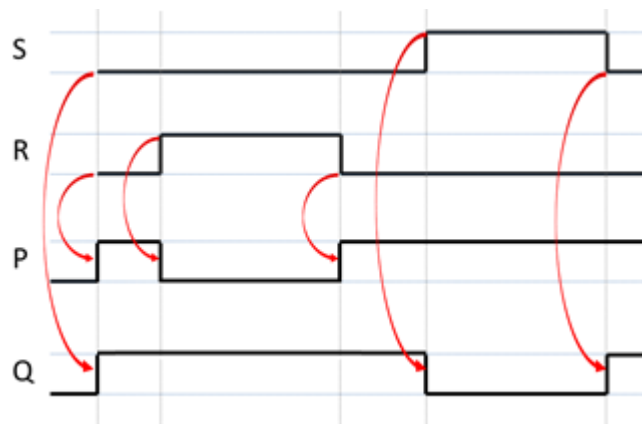


P1.



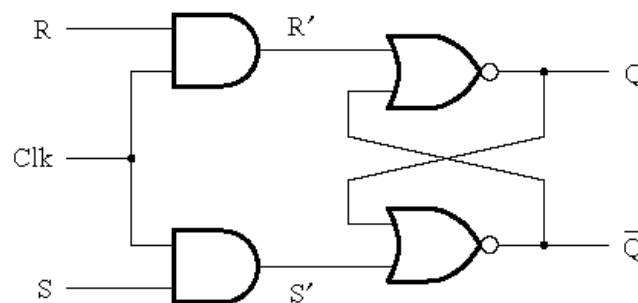
P2. a)



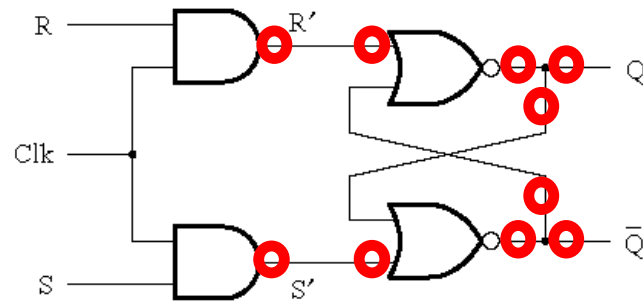
- b) i. This is an undesirable input combination. Both Q and P will become 1 (i.e., not complement of each other). If both R and S switched to 1 at the same time, the outputs will start to oscillate.
- ii) Q=0 and P=1.
- iii) Q=1 and P=0.
- iv) Q and P will remain unchanged if P is complement of Q originally.

P3.

Fig. 5.5(a):



Adding bubbles:



Converting to NANDs and cancelling NOTs:

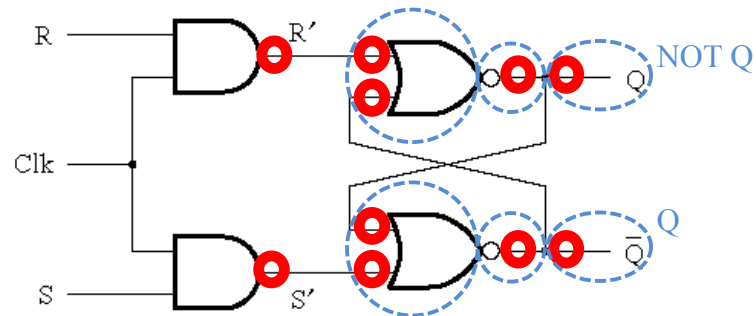
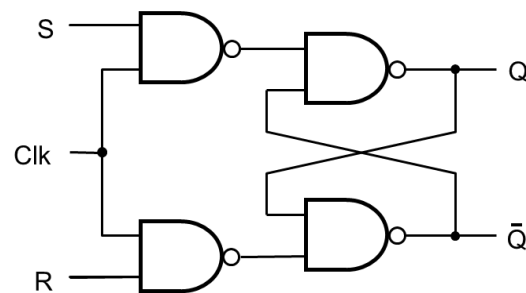
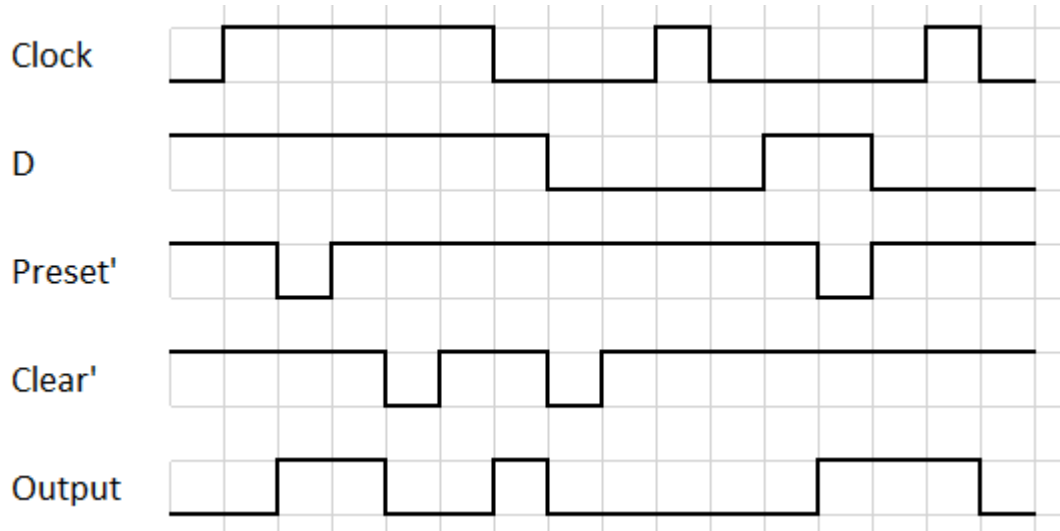


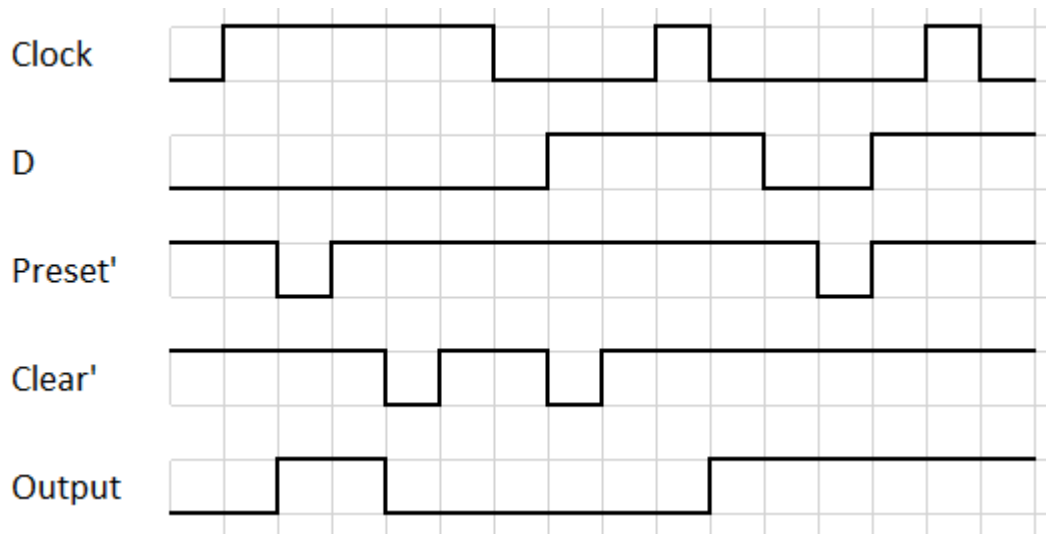
Fig. 5.6:



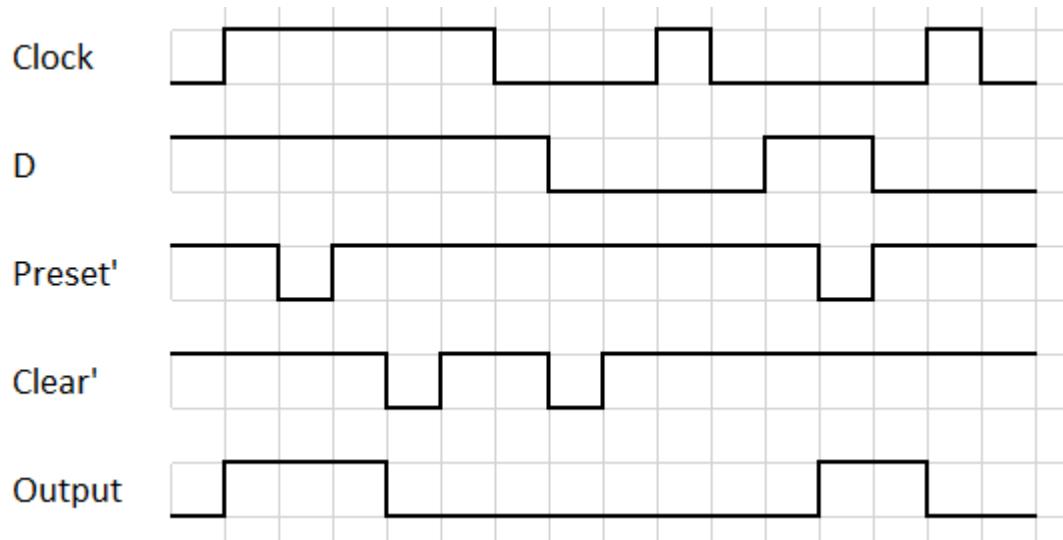
P4. a) (In the diagram below, Preset' = Preset_n, Clear'=Clear_n, Output=Q.)



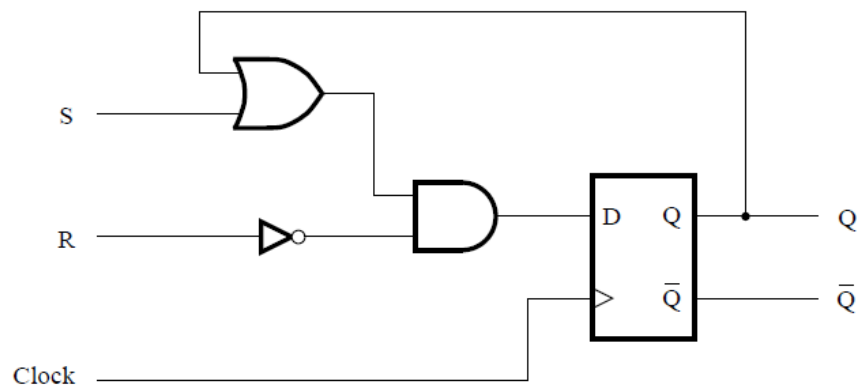
b)



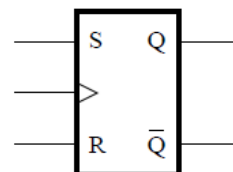
c)



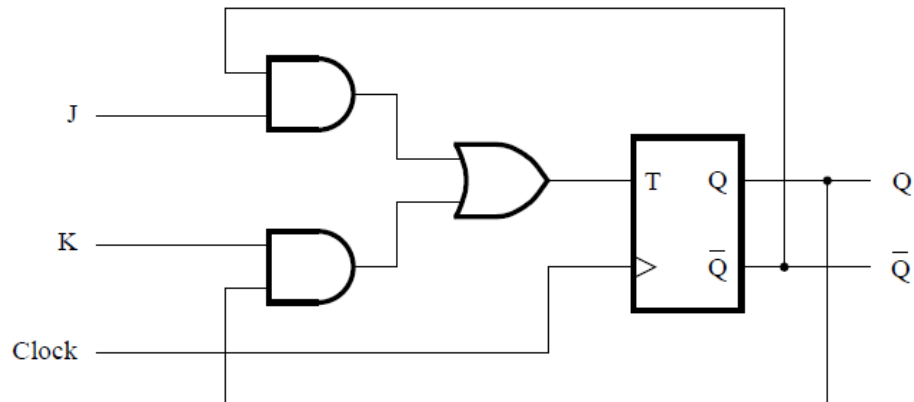
P5. a)



S	R	$Q(t+1)$
0	0	$Q(t)$
0	1	0
1	0	1
1	1	0



b)



P6.

Assuming both flip-flops are initialized with internal values of 0:

