

Exam 1 review Key

1.

a) Yes

b) No

c) No

d) No (because of S) if "s" was an "a", Yes.

2.

a) Yes

b) Yes

c) No

d) Yes

3.

a) NO

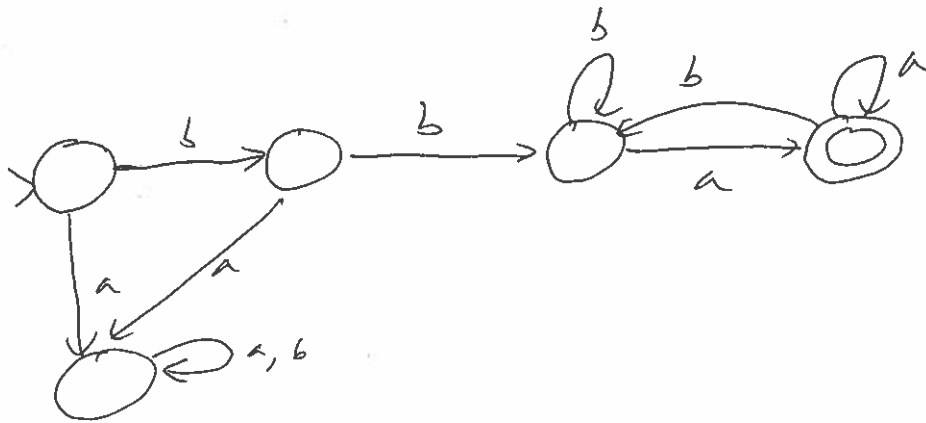
b) Yes

c) No

d) Yes

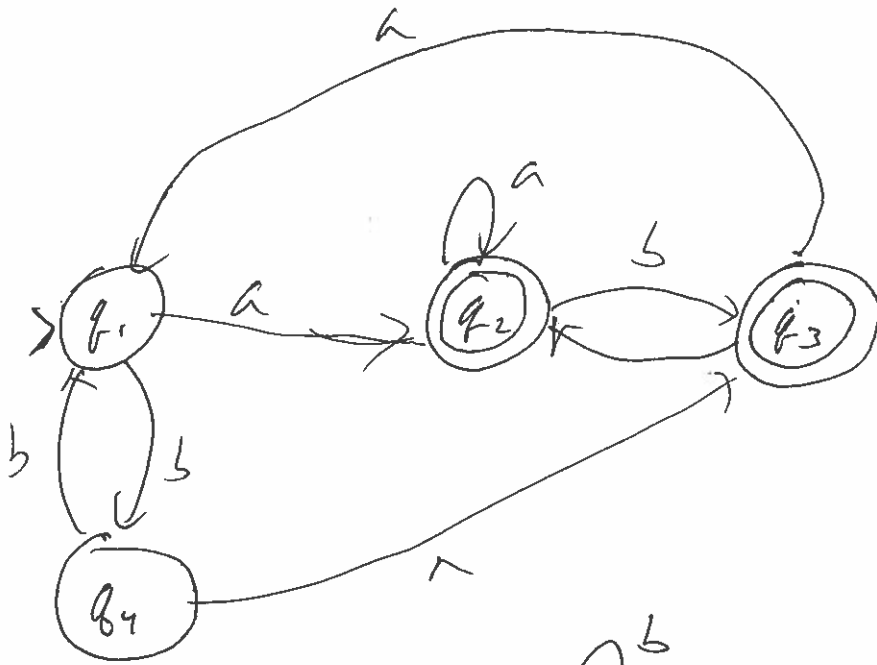
e) No

4.

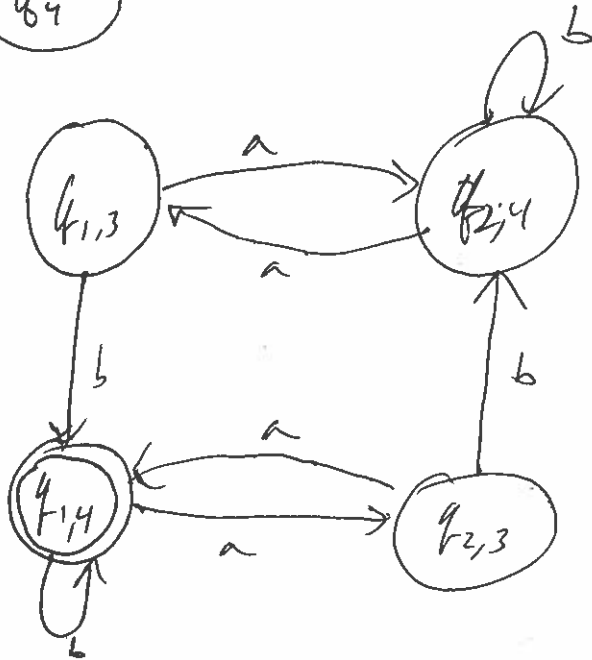


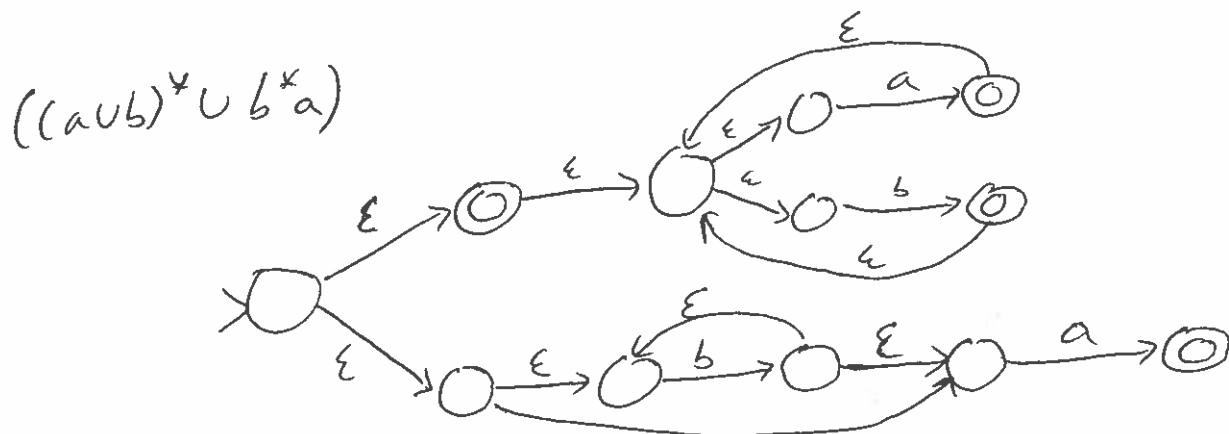
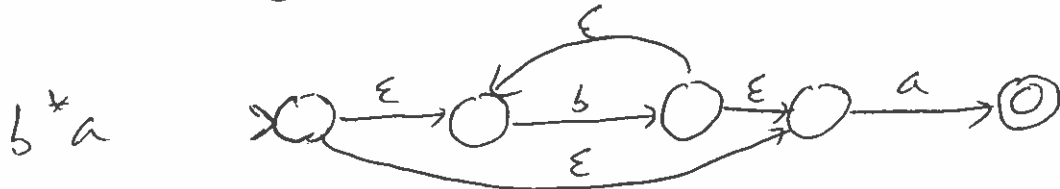
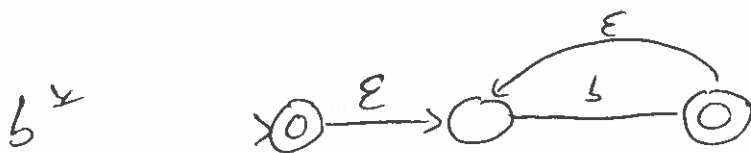
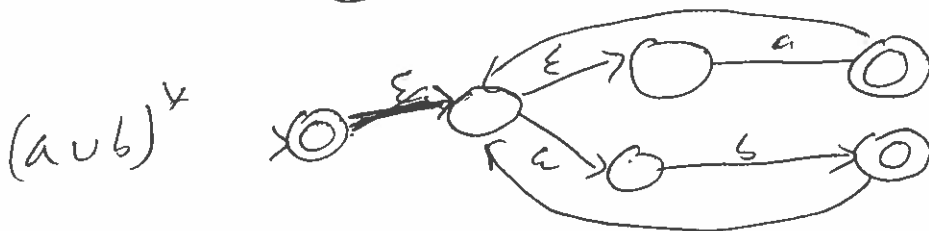
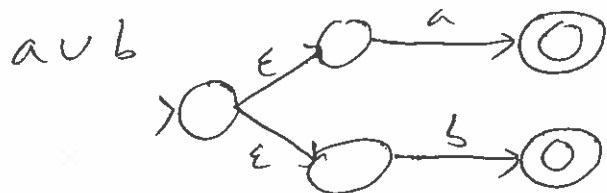
5. $((aa \cup bbb)(a \cup b)^*) \cup ((a \cup b)^* bbb)$

6.

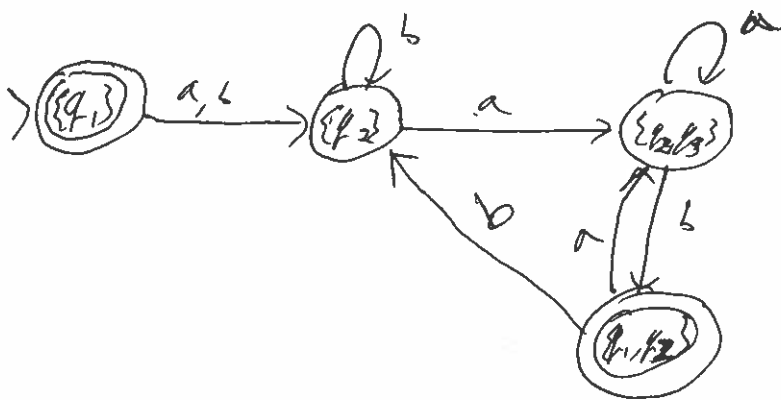


7.





9.



10. $S = a^p b^{2p}$

$Y = a^k$ for some $1 \leq k \leq p$

if we pump w/ $i=2$

we get $a^{p+k} b^{2p}$ which
is not in L .

Contradiction, so language is not regular.

11. $S = a^p b^{2p+4}$

$Y = a^k$ for some $1 \leq k \leq p$

if we pump w/ $i=0$

we get $a^{p-k} b^{2p+4}$

$2(p-k) + 5 <= \cancel{2p-2+5}$
 $2p-2+5$

$2p+3 < 2p+4$

So not in L

12.

