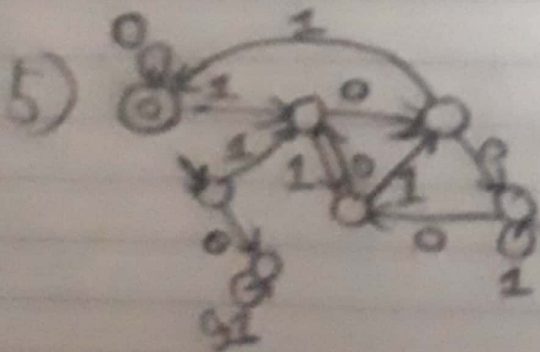
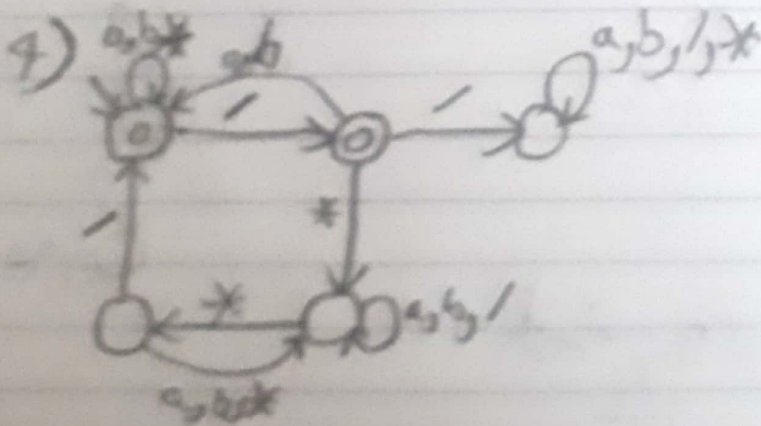
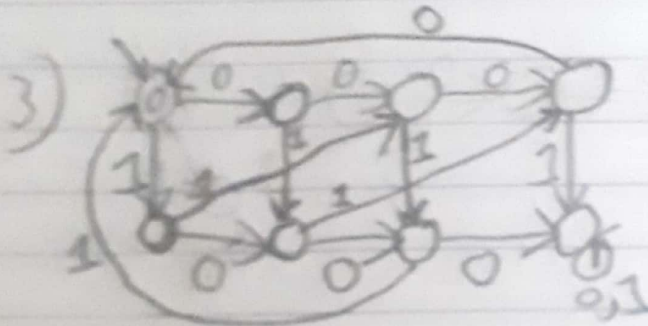
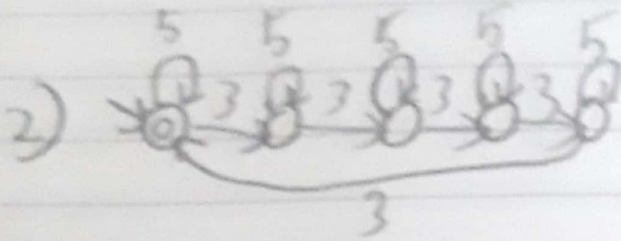
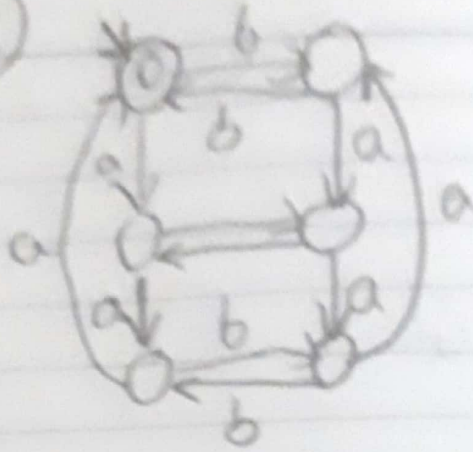
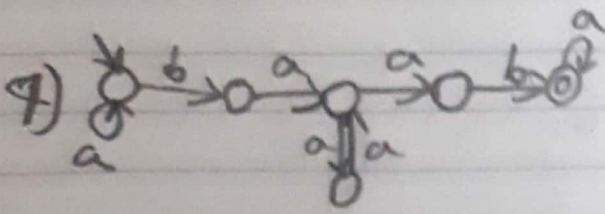
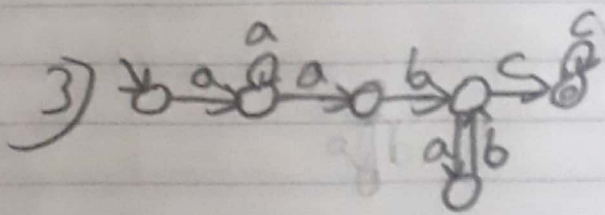
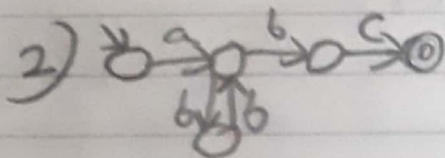
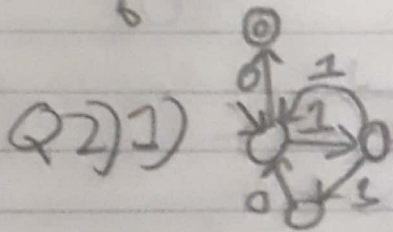
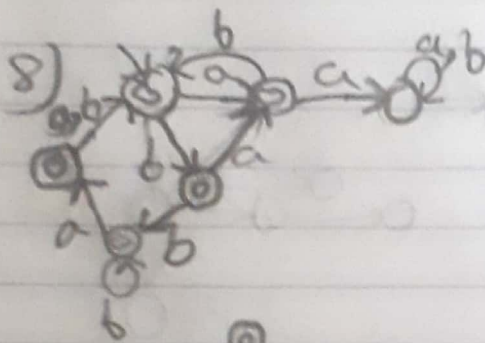
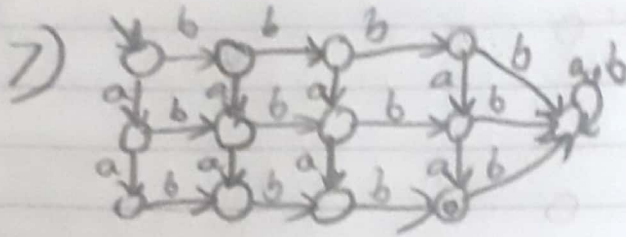
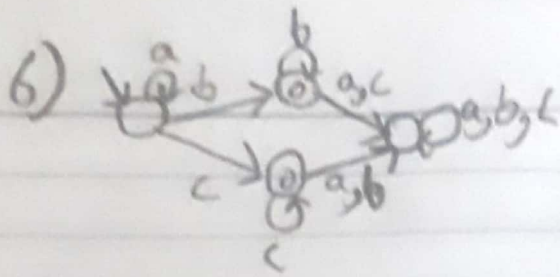


Revision sheet for the 24th

Q.11)





Q3) 1) any string that ends with 01

2) any string that contains one 0

3) any string with an even number of 1s and no 0s

4) any string that contains even number of 1s

5) any string with substring 01

Q4) 1)  $(a^*ba^*ba^*ba^*)^*$

2)  $\Sigma^* \text{main} \Sigma^*$

3)  $\Sigma^* x \Sigma^* x \Sigma^* x \Sigma^*$

4)  $\{a-zA-Z,-\}^* \{a-zA-Z,-,0-9\}^*$

Q5) 1)  $(a^*bab)^*b(a|b)$

2)  $(0|1\varepsilon)(00|1\varepsilon|01\varepsilon)^* | ((1|01)(\varepsilon|10(01|1)))^*$

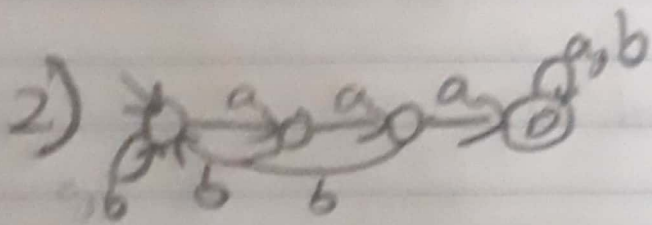
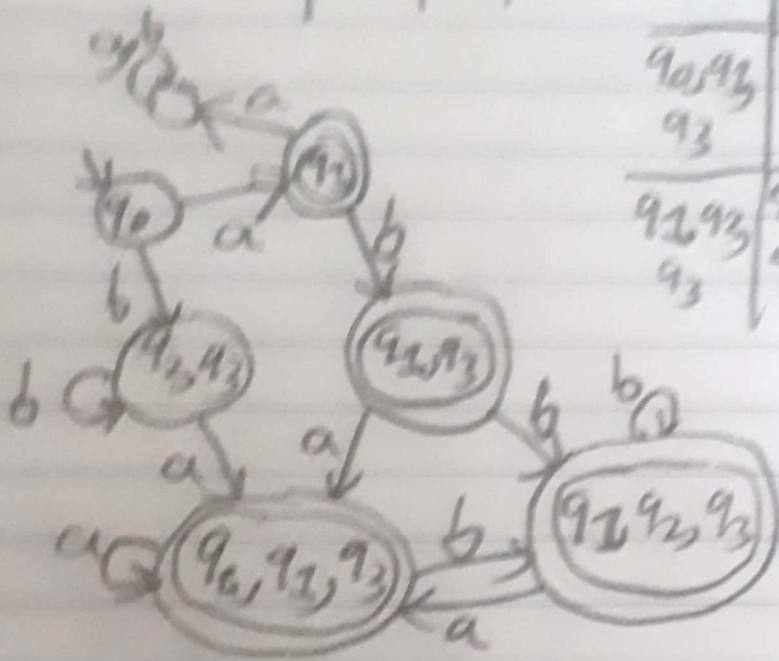
Q6)



Q6)

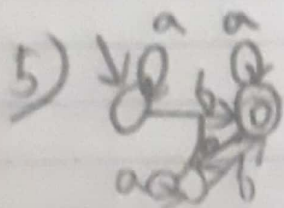
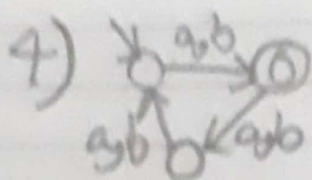
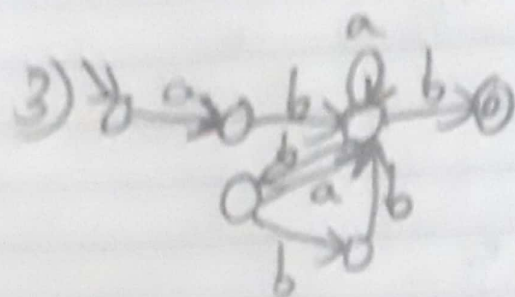
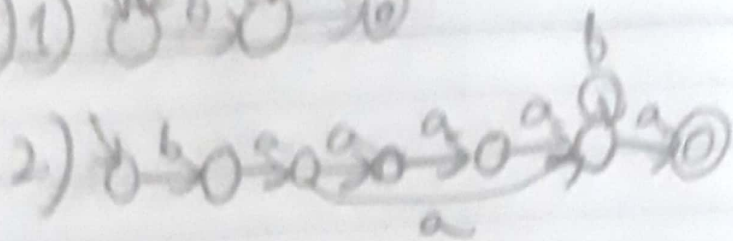
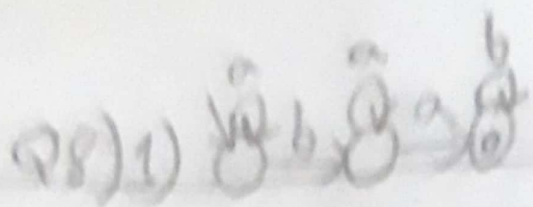
	a	b	$\epsilon$
$q_0$	$q_1$	$q_1$	$q_0, q_1$
$q_1$	—	$q_2$	$q_1$
$q_2$	—	—	$q_1, q_3$
$q_3$	$q_2, q_3$	$q_2$	$q_3$

	a	b
$q_0$	$q_1$	$q_2, q_3$
$q_1$	—	$q_2, q_3$
$q_2, q_3$	$q_2, q_3, q_3$	$q_2, q_3$
$q_2, q_3$	$q_2, q_3, q_3$	$q_2, q_3, q_3$
$q_2, q_3, q_3$	$q_2, q_3, q_3$	$q_2, q_3, q_3$
$q_3$	$q_3$	$q_3$
$q_1, q_3$	$q_2, q_3, q_3$	$q_2, q_3, q_3$
$q_3$	$q_3$	$q_3$



Q1) aa, aab, bb, bbaa

2) a, b, ab, ba



Q9) 1) if  $L$  is regular then  $L = xyz$  where  $xyz$  is regular.

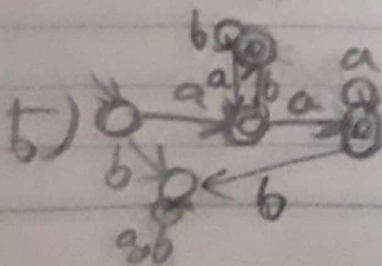
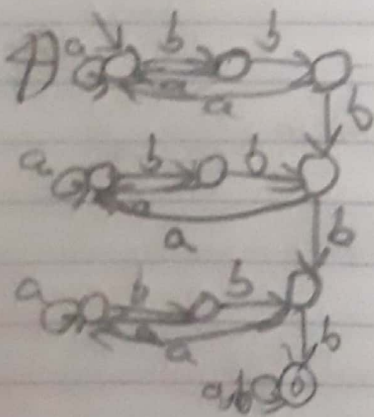
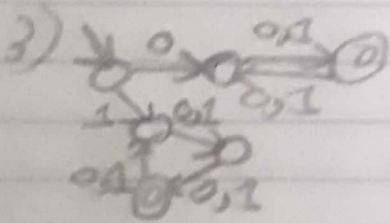
let  $x = a^n, y = b^1, z = a^{n+1}$ . Since  $xyz$  is regular then  $xyyz$  must also be regular.  $xyyz = a^n b^2 a^{n+1}$ , since  $n \neq 2n \neq n+1$  then  $xyyz$  is not regular therefore  $L$  is not regular.

2) if  $L$  is regular then  $L = xyz$  where  $xyz$  is regular.

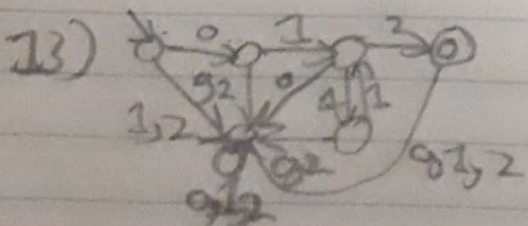
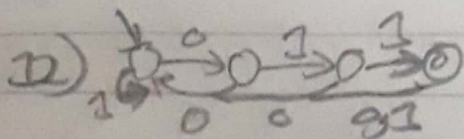
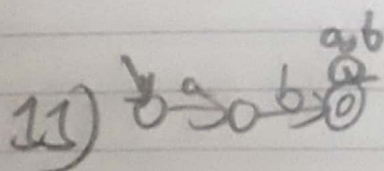
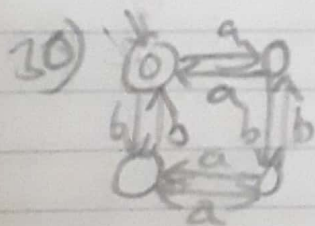
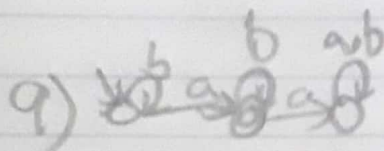
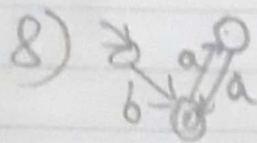
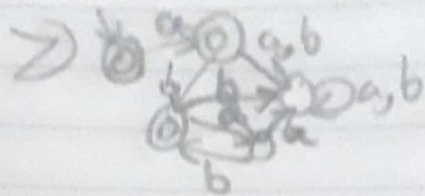
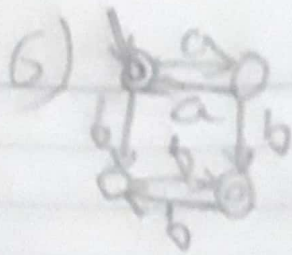
let  $x = a^m, y = b^{2m}, z = c^{2m}$ , since  $xyz$  is regular then  $xyyz$  must also be regular.  $xyyz = a^m b^{4m} c^{2m}$ , since  $m \neq 4m \neq 2m$  then  $xyyz$  is not regular therefore  $L$  is not regular.

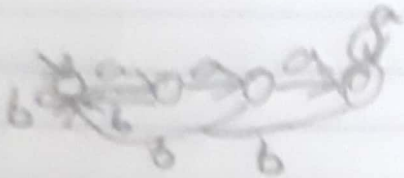
assume w/h and let  $x \in a$ ,  $y \in a^{d-2}$ ,  $z \in a$ . Since  $xyz$  is regular then  $xyyz$  must also be regular.

Q1)









Q) 1)  $b^*(ab^*ab^*)^*$

2)  $a^*b(a^*ba^*b)^*a^*$

3)  $b^*(ab^*ab^*)^* \cup a^*b(a^*ba^*b)^*a^*$

4)  $(aa^*(bb)^*)^*$

5)  $\epsilon \cup \epsilon^+ b$

6)  $a^*b^*$

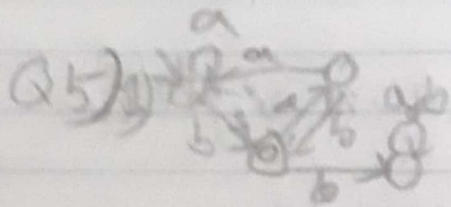
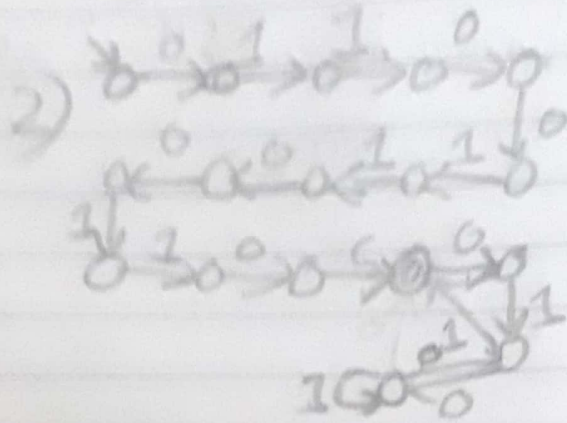
7)  $\epsilon^*(aab \cup abab \cup ba a)\epsilon^*$

8)  $b^*(\emptyset \cup ab^*(\emptyset \cup ab^*))$

9)  $b^*ab^*a\epsilon^*$

10)  $(a \cup ba^*(\emptyset \cup bb)(a \cup ab))^*$

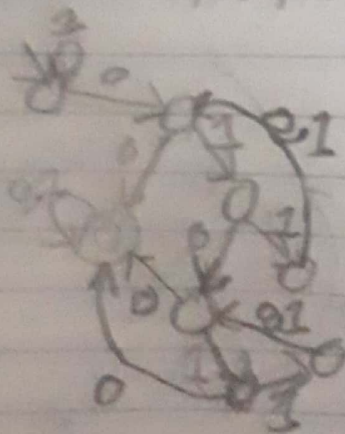




2)

	0	1	$\epsilon$
$q_0$	$q_0, q_1, q_2$	$q_0$	$q_0$
$q_1$	$q_0, q_1, q_2$	$q_1$	$q_1$
$q_2$	$q_3$	$q_3$	$q_2$
$q_3$	$q_1$	$q_1$	$q_3$
$q_4$	$q_4$	$q_4$	$q_4$

	0	1
$q_0$	$q_0, q_1$	$q_0$
$q_1$	$q_0, q_1, q_2, q_3, q_4$	$q_0, q_2$
$q_2$	$q_0, q_3, q_4$	$q_0, q_3$
$q_3$	$q_0, q_1, q_2, q_3, q_4$	$q_0, q_1, q_2$
$q_4$	$q_0, q_1, q_2, q_3, q_4$	$q_0, q_1$
$q_5$	$q_0, q_1, q_2, q_3, q_4$	$q_0, q_1, q_2, q_3$
$q_6$	$q_0, q_1, q_2, q_3, q_4$	$q_0, q_1, q_2, q_3$



Q6)  $(1^*0(a1010^*10^*(a10^*1)0)^*)^*$

Q7) a) if  $S$  is regular then  $S = xyz$  where  $xyz$  is regular.

let  $x = a^{n-1}, y = a, z = b^n$ . Since  $xyz$  is regular  $xyyz$

must also be regular.  $xyyz = a^{n-1}ab^{2n}$ , let  $n = 2m+1 \neq 2m$

therefore  $S$  is not regular.

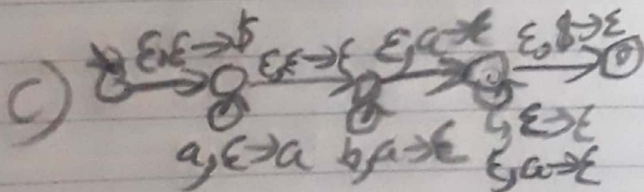
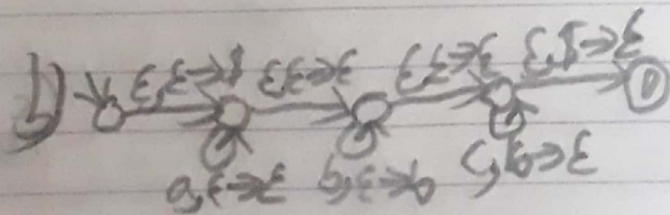
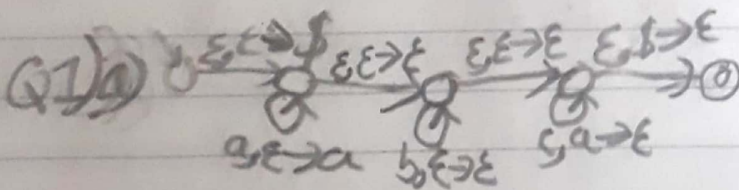
b) assume

$|S| > 3$  and  $S = uvkw^rV$  where  $k \in \{a, b, c\}$ . if  $S$  is regular

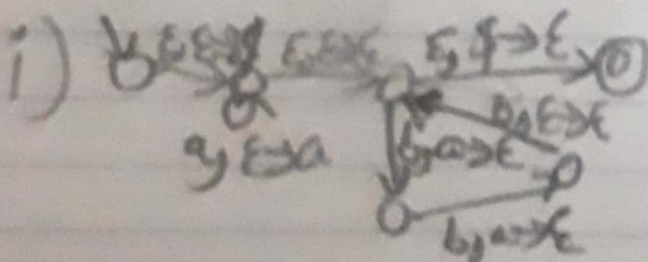
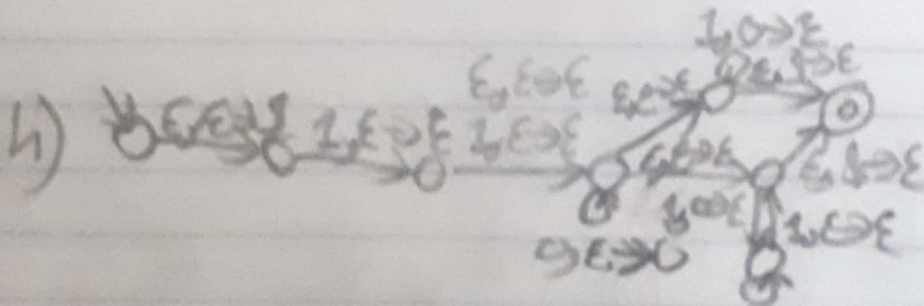
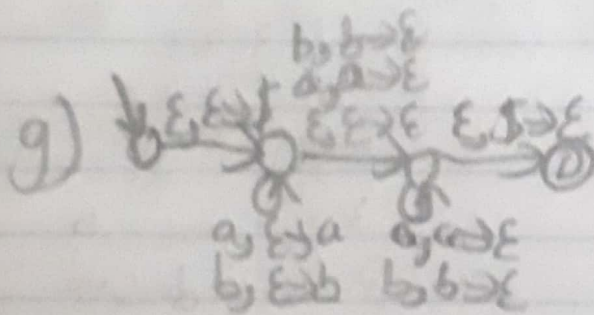
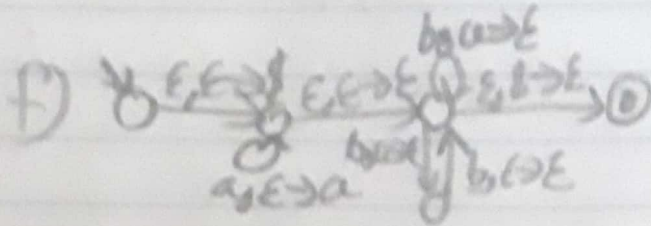
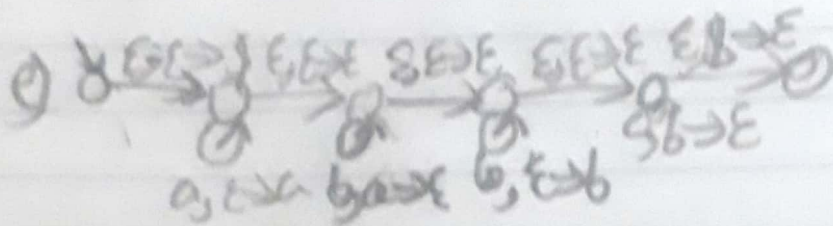
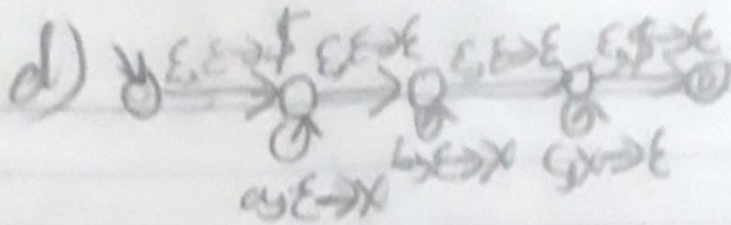
then  $S = xyz$  where  $xyz$  is regular. let  $x = u, y = kw, z = w^rV$

Since  $xyz$  is regular then  $xyyz$  is also regular

## Theory of computation Review sheet







Q2) a)  $S \Rightarrow asa \mid X$   
 $X \Rightarrow bX \mid \epsilon$



6) 5205056

c)  $S \rightarrow 1350 / 1577 / 1578 / 1611 / 1612 / 1613 / 1614 / 1615 / 1616$

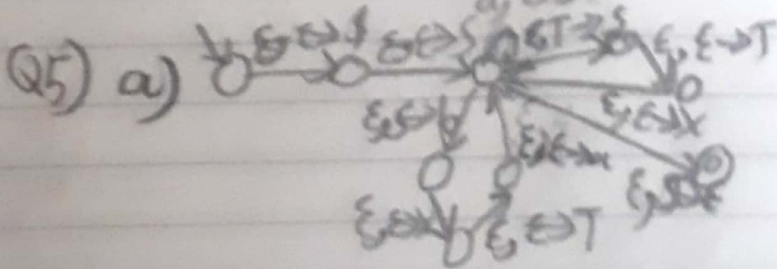
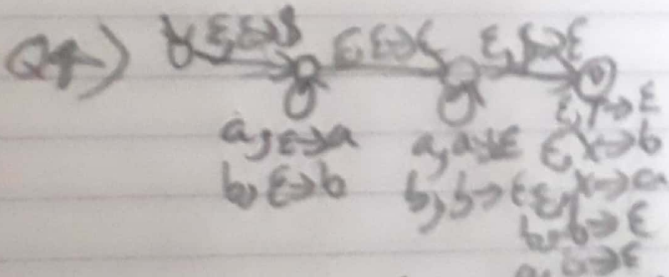
Disasche

$$x \rightarrow bxc / \varepsilon$$

Q3) a) has segments with methane elevators

b) Was signalisiert die Veränderung des Konsums?

c) the beginning straight floes



b)  $2 \rightarrow 5$

$$S \rightarrow aA$$

A → TB

$$A \rightarrow ab|bb$$

$T \rightarrow CSIE$

$C \rightarrow aT | bT$

$$1) S \rightarrow AB$$
$$A \rightarrow ax$$
$$B \Rightarrow bX$$
$$x \rightarrow \text{axis } 16x/16dE$$