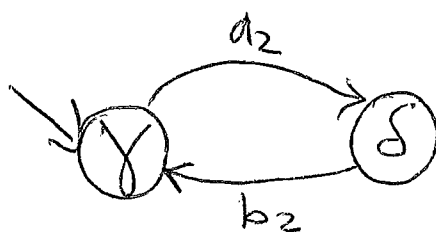


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1. (c) (i)

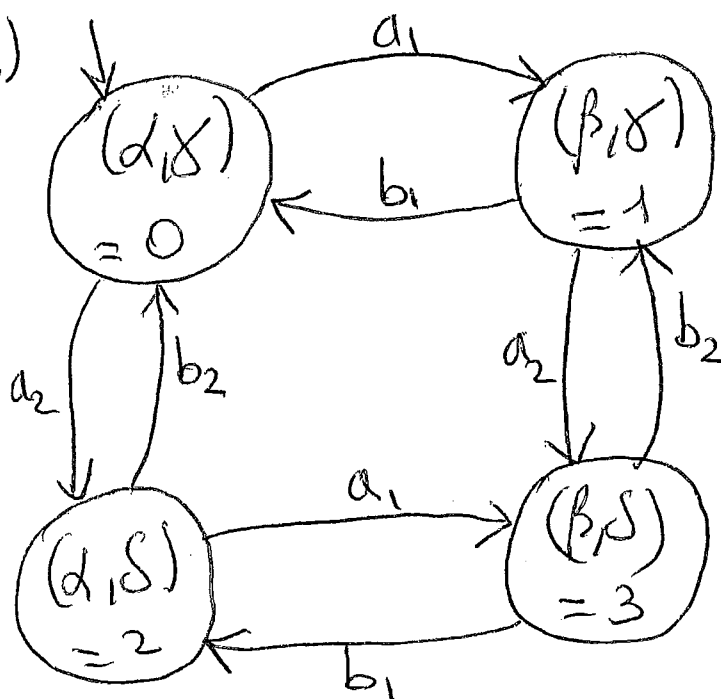


$$L(G_1) = \overline{(a_1 b_1)^*}$$



$$L(G_2) = \overline{(a_2 b_2)^*}$$

(ii)



$$G = G_1 \parallel G_2$$

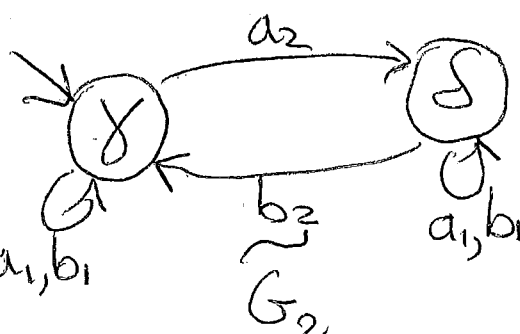
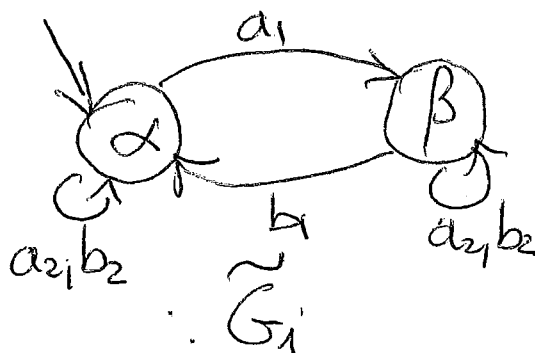
(d) (v)



$$\hat{G} = G_1 \times G_2$$

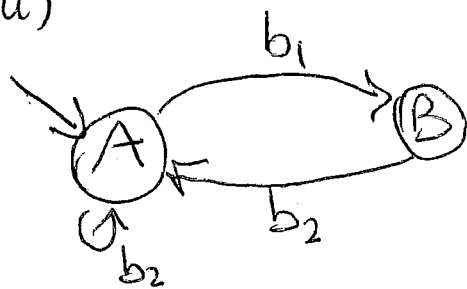
$$L(\hat{G}) = \{\epsilon\}$$

(vi)



$$\tilde{G}_1 \times \tilde{G}_2 = G_1 \parallel G_2 = G$$

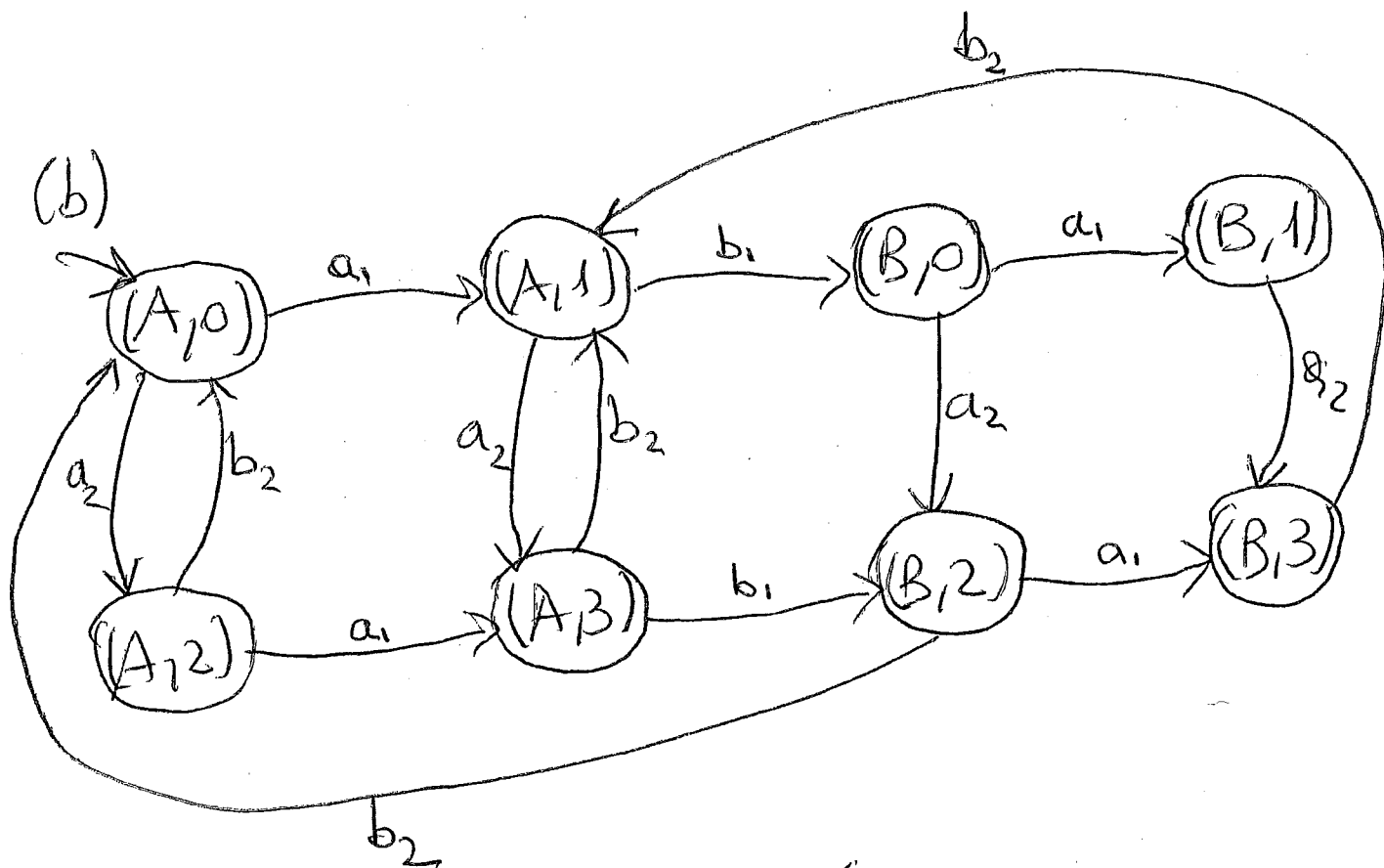
2. (a)



$$E = \{b_1, b_2\}$$

$$K = L(H_{\text{spec}}) = \overline{(b_2^* b_1 b_2)^*}$$

(b)



$$H = H_{\text{spec}} \parallel G$$



$$\hat{H} = H_{\text{spec}} \times G$$