

3. Simplify the following regular expressions: [7 points each]

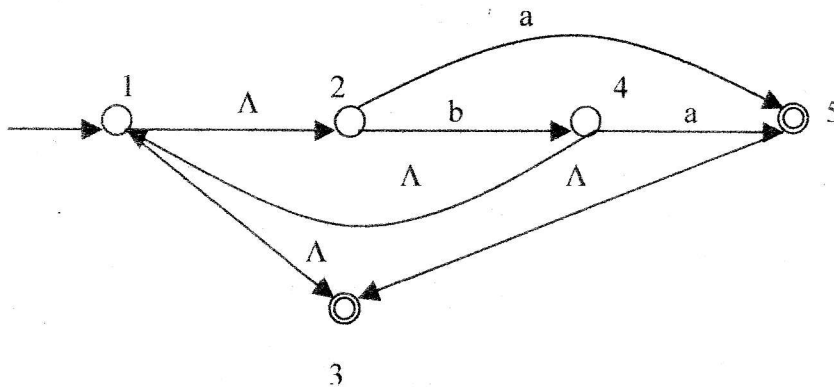
(a) $a(a+b)^* + b(a+b)^*$

$$(a+b)^+$$

(b) $((a^*b)^* + (ab^*)^*)^*$

$$(a+ab)^*$$

4. For the following NFA- Λ , answer the questions below:



(a) Find $\delta^*(1, ba)$. [5 points]

$$\delta^*(1, ba) = \{3, 5\}$$

(b) Find $\Lambda(\{4\})$. [5 points]

$$\Lambda(\{4\}) = \{1, 2, 3, 4\}$$

$$\left(\begin{array}{ll} \delta^*(1, a) = \{1, 2, 3, 4\} & \\ \delta^*(1, a) = \{3, 5\} & \delta^*(3, a) = \emptyset \\ \delta^*(2, a) = \{3, 5\} & \delta^*(4, a) = \{3, 5\} \end{array} \right)$$