

q1:  $L = \{(x^i)(y^i) : i+j \text{ is even}\}$

write the regular expression

$\Rightarrow$

$$((x.x)^*).(x.y.(y.y)^* + (y.y)^*)$$

q2:  $L\{(a^i)(b^j)(c^k) \mid i \neq j \text{ or } j \neq k\}$

write the context free grammars

$\Rightarrow$

$$\langle S \rangle \rightarrow \langle S1 \rangle \langle Ci \rangle \mid \langle Ai \rangle \langle S2 \rangle$$

$$\langle Ai \rangle \rightarrow a \mid a \langle Ai \rangle \mid \epsilon$$

$$\langle Ci \rangle \rightarrow c \mid c \langle Ci \rangle \mid \epsilon$$

$$\langle A \rangle \rightarrow a \mid a \langle A \rangle$$

$$\langle B \rangle \rightarrow b \mid b \langle B \rangle$$

$$\langle C \rangle \rightarrow c \mid c \langle C \rangle$$

$$\langle S1 \rangle \rightarrow a \langle S1 \rangle b \mid \langle A \rangle \mid \langle B \rangle$$

$$\langle S2 \rangle \rightarrow b \langle S2 \rangle c \mid \langle B \rangle \mid \langle C \rangle$$