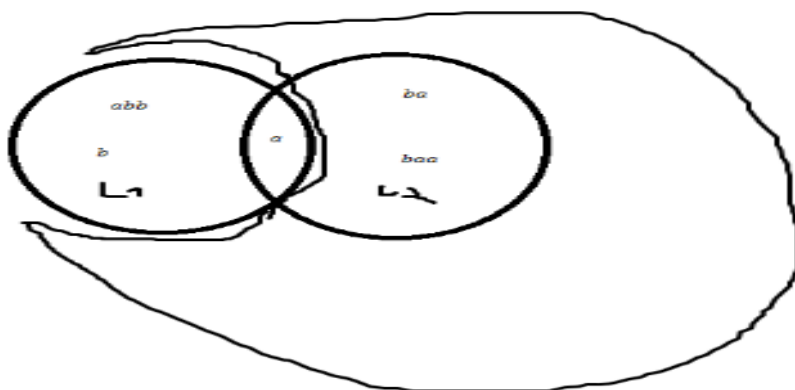


TP 1 :

$L1 = \{abb, b, a\}$ $L2 = \{ba, baa, a\}$

- 1) $L1 \cup L2 = \{abb, b, a, ba, baa, a\}$
 $L2 \cap L2 = \{a\}$
 $L1.L2 = \{abbba, abbbba, abba, bba, bbba, ba, aba, abaa, aa\}$
 $L2.L1 = \{baabb, bab, baa, baaabb, baab, baaa, aabb, ab, aa\}$
 $(L1.L2) \cap (L2.L1) = \{aa\}$
 $(L1)^0 = \{e\}$
 $(L2)^2 = \{baba, babaa, baa, baaba, baabaa, baaa, aba, abaa, aa\}$
 $\underline{L1} \cap L2 = X^* \setminus L1 \cap L2$
 $= L2 \cap X^* \setminus L1$
 $= L2 \setminus L1$
 $= \{ba, baa\}$



$(L1 \cup L2)^2 = \{ abbabb, abbb, abba, abbba, abbbba, babb, bb, ba, bba, bbba, aabb, ab, aa, aba, abaa, baabb, bab, baa, baba, babaa, baaabb, baab, baaa, baaba, baabaa \}$

$(L1)^3 \cap L2 = \{baa\}$

$L1 \cap L2^* = \{a\}$

2)

$(d+c) = \{d, c\}$

$(c^*+e) = \{\text{eps}, c, cc, ccc, \dots, e\}$

$da(a+c+t)f = \{daaf, dacf, datf\}$

$(a+b)(c+d) = \{ac, ad, bc, bd\}$

$b(e+f)^* = \{be, bf, bee, bff, bef, bfe, beee, bfff, \dots\} : b.(e+f).(e+f) : X=\{b,e,f\} X'=\{e,f\} \rightarrow$

$\{w \in X^* \mid w=b.w', w' \in X'\}$

$(b+c)^* = \{e, b, c, bb, bc, cb, cc, \dots\}$

$(ba+abc) = \{ba, abc\}$

$(bba+bbba^*) = \{bb, bba, bbba, \dots\}$

$(ab^+)^* = \{e, ab, abb, abbb, abab, abbab, ababb, ababbabb, \dots\}$

$(a^+b^+)^+ = \{ab, aab, abb, aabb, aba, abab, aababb, \dots\}$

$(a+b)^*a(a+b)^*a(a+b)^* = \{aa, aaa, aba, baa, aab, babaa\} \rightarrow \{w \in \{a,b\}^* \mid |w|_a \geq 2\}$

3)

{a, aa, aaa, aaaa...}

$= a^+$

{aba, aca, ada, aea}

$= a(b+c+d+e)a$

{abc, cbc, abcbc, cbcbc, abcbcb...}

$= (a + c)bc^+$

{am, cm, an, cn}

$= (a+c)(m+n)$

{bd, bad, baad, baaad, baaaad ...}

$= b(a^*)d$

4)