"Assignment. 02"

(i). All words in which "a" appears a tripplecl, if at all. clump of a's contain 3 or 6 or 9 ... .

↳ $(aaa+b)^*$

(ii) All words that contain at least one of the string s_1, s_2, s_3 or s_4.

↳ $(a+b)^*(s_1+s_2+s_3+s_4)(a+b)^*$

(iii) All words that contain exactly three bs in total.

↳ $a^*ba^*ba^*ba^*$

(iv). All words that contain exactly two bs or exactly three bs, not more.

↳ $a^*ba^*ba^* + a^*ba^*ba^*ba^*$

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(v). (i). All strings that ends in double letter.

↳ $(a+b)^*.(aa+bb)$

(ii). All string that have exactly one double letter in them.

↳ $(\lambda+b)(ab)^*(ba)^*(b+\lambda)+(a+\lambda)(ba)^*(ab)^*(a+\lambda)$

(vi). All strings in which the letter b is never trippled.

↳ $(\lambda+b+bb)(a+ab+abb)^*$

(vii) All words in which "a" is trippled or "b" is trippled. but not both.

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

(viii). (i). All strings that donot have the substring ab.

↳ b^*a^*

(ii). All string that donot have both bba and abb.

↳ $a^*(baa^*)^*b^* + b^*(a^*ab)^*a^*$

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(iv). All strings in which the total no's of 0's is divisible by 3.

↳ $(b^*ab^*ab^*ab^*)^*$

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$(b^*ab^*ab^*ab^*)^*$

(11) a) All string in which any b's that occur are found in clumps of an odd number at a time, such as abaabbbab.

$a^*(b(bb)^*aa^*)^*(\lambda + b(bb)^*)$

b) All strings that have an even number of a's and an odd number of b's

$(aa+bb+(ab+ba)(aa+bb)^*(ab+ba))^*$

c) All strings that have an odd number of a's and an odd number of b's

$(ab+ba)(ac+bb+(ab+ba)(aa+bb)^*(ab+ba))^*$

(12) Let us reconsider the regular expression

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

(1) Show that this is equivalent To

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

babaabab + a ba bbaba

bb ab

(iii) i) $(ab)^*a$ $\not\equiv$ $a(ba)^*$

$(ab)^*a$, and $a(ba)^*$

Represent same language no bb's and starting and ending with a.

ii) $(a^*+b)^*$ $\not\equiv$ $(a+b)^*$

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

a^*+b^* a^*+b^*

Both are all strings Possible in $\Sigma=\{a,b\}$

iii) $(a^*+b^*)^*$ $\not\equiv$ $(a+b)^*$

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

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