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SUBJECT	**THEORY OF AUTOMATA**
SEMESTER	**6TH**
PROGRAM	**BS(CS)**

Q#1. Keeping in view the Kleene's Theorem, proof for any language S. S+= (S+)+

Ans:

$S^+=(S^+)^+$

Solution: since S^+ generates all possible strings that can be obtained by concatenation the strings of S, so $(S^+)^+$ generates all possible strings that can be obtained by concatenating the strings of S^+ will not generate any new string.

Hence $(S^+)^+=S^+$ so,

$S^{++} \subset S^+ \longrightarrow$ EQ1

Also we know that

$A \subset A^+ \longrightarrow$ EQa

Now, if in equation (EQa) we replace A with S^+ we get

$S^+ \subset S^{++} \longrightarrow$ EQ2

Form both the EQ1 and EQ2 proved that

$S^+=S^{++}$

$(S^+)^+=S^+$

Solution: since S^+ generates all possible strings that can be obtained by concatenating the strings of S, so $(S^+)^+$ generates all possible strings that can be obtained by concatenating the strings of S^+, will not generate any new string.

Hence $(S^+)^+=S^+$

Q#2. How many words does S* will have of length 3, 4 and 5, if

S = {ab   ba}

(Design S* and then write answers on the basis of words of S*)

Ans:

S* = {^, ab, ba, abab, baab, baba, ababab, ababba, abbaba, bababa, babaab, baabba, baabab,……..}

Total length is = n^n

Total number of 4=2^2=16

For length 3 and 5 we can't find length because it odd and we have language fo even numbers.

Q#3. Fill in the blanks.

1. A dictionary is arranged in __________**Alphbetical**_______ order.
2. + is called _______**positive**___________ instances.
3. * is called ________**Kleene**__________ instances.
4. ? is called _______**zero/one**___________ instances.
5. A Formal Language is game of _____ **focus** ____ on paper.
6. ^ is included in ______**Kleene**________ closure.
7. ______**Palindrome**____ is a word whose reverse is equal to itself.
8. ___**Concatenation**____ is an operation in which symbols are placed side by side.
9. {a b} = {b a} for _____**Matrice**____ operation.
10. Two words having same symbols in same order are called ____**same**____ words.