Tutorial -3   (18/9/2020)

1. What are *acceptors*? What is an *acceptor* and generator and representator in the context of regular language?

2. Give the classification of *Finite Automata*?

3. Regular grammars are of two types namely _____ and _____

4. What are the operators that Regular Expression contains?

5. What are primitive Regular Expressions?

6. If r1 and r2 regular expression, are the following would be a regular expression
   a. r1+r2
   b. r1.r2
   c. r1*

7. Form the languages for the following regular expression: Φ (fi), ∈, a, a*, a+, and (a+b)*

8. Write the regular expression for the language having a string that should have at least one 0 and at least one 1.

9. Concatenation of R with Φ outputs:
   a. R
   b. Φ
   c. R.Φ
   d. None of the mentioned

10. Describe the language denoted by following regular expression
r.e. = (b* (aaa)* b*)*

11. Which of the following languages is generated by given grammar?
S -> aS | bS | ∈

a) $\{a^n b^m \mid n,m \geq 0\}$
b) $\{w \in \{a,b\}^* \mid w$ has equal number of a's and b's$\}$
c) $\{a^n \mid n \geq 0\} \cup \{b^n \mid n \geq 0\} \cup \{a^n b^n \mid n \geq 0\}$
d) $\{a,b\}^*$

Questions to solve within 20/9/2020 (Sunday)
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1. Design a NFA from given regular expression 10 + (0 + 11)0* 1

2. True or False: Give a proper explanation for your answer.
"If L is a regular language and F is a finite language (i.e., a language with a finite number of words), then (L U F) must be a regular language"

3. If L1 = $\{a^n \mid n \geq 0\}$ and L2 = $\{b^n \mid n \geq 0\}$, consider
i) L1.L2 is a regular language.
ii) L1.L2 = $\{a^n b^n \mid n \geq 0\}$
Which one is correct? Explain.

4. Find regular grammar for given languages:
i) L (G) = $\{a^m b^n \mid m \geq 0$ and $n > 0\}$
ii) L (G) = $\{a^m b^n \mid m > 0$ and $n \geq 0\}$
iii) L (G) = $\{a^m b^n \mid m \geq 0$ and $n \geq 0\}$
iv) L (G) = $\{a^m b^n \mid m > 0$ and $n > 0\}$
v) L (G) = $\{a^m b^n \mid m > 0$ or $n > 0\}$