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1.. FA corresponding to an NFA can be built by introducing an empty state for a letter having

a) no transition at certain state
b) one transition at certain state
c) two transitions at certain state
d) more than two transitions at certain state

2. Σ={a,Aa,Abb}, then string aAaAbbAa has _____ length.

a) One
b) Two
c) Three
d) Four

3. Languages generated by Kleene star are always _____.

a) Finite
b) Infinite
c) Sometimes finite & sometimes infinite
d) None of the these

4. In order to make NFA for the union of FA1 and FA2, the final state/ states of:

a) both FAs should be linked
b) both FAs should be left intact
c) FA1 have a transition to the final state of FA2

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d) FA2 have a transition to the final state of FA1

5. Let S = {aa, bb} be a set of strings then s* will have

a) Λ
b) abba
c) aabbbaa
d) bbaab

6. If r1 = (aa + bb) and r2 = (a + b) then the language (aa + bb)* will be generated by

a) (r1)(r2)
b) (r1 + r2)
c) (r2)*
d) (r1)*

7. If a language can be expressed through FA, then it can also be expressed through TG.

a) True
b) False
c) Depends on language
d) None of the above

8. Suppose we have FA3 which is equal to the union of FA1 and FA2. Now the initial state of the FA3 will be equal to:

a) Only initial state of FA1
b) Final state of FA2
c) Only initial state of FA2
d) Initial state of FA1 or FA2

9. Introducing new final state in case of multiple final states is the step no. _____ of proving Kleene's theorem part II.

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a) 4
b) 1
c) 2
d) 3

10. In proving Kleene Theorem II, circuits are reduced into:

a) asterisk
b) difference
c) both difference and asterisk
d) sum

11. Finite Automaton (FA) has:

a) Zero or more final states
b) Exactly one final state
c) Not more than two final states
d) Exactly two final states

12. The formal language is also known as _____.

a) Semantic language
b) Informal language
c) Syntactic language
d) Normal language

13. The language of all strings defined over alphabet set = {x, y} having triple x's or triple y's will have the minimum strings with length of:

a) 1
b) 3
c) 4
d) 2

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14. If an alphabet has "2" number of letters, then total number of strings of length "3" will be _____.

a) 5
b) 9
c) 8
d) 6

15. GTG for the expression (a+b)*bb may have minimum number of states:

a) 3
b) 4
c) 2
d) 1

16. Consider the Regular Expression (RE) a (a + b)b*. Which one of the following is NOT accepted by the provided RE?

a) aa
b) aab
c) aba
d) abb

17. Which of the following is NOT true about the term alphabet?

a) It is usually denoted by Greek letter sigma
b) It can be an empty set
c) Strings are generated by concatenating its elements
d) It is a finite set of symbols

18. Which of the following is free of non-determinism?

a) FA
b) TG
c) NFA

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d) NFA-^

19. The aa(a+b)*bb is the RE of the language defined over Σ={a,b}.The language must _____.

a) have at least two ab
b) have at least one aa and one bb
c) have at least one abbb
d) have at least one ba

20. Reverse of string "YxwzYz" defined over Σ ={w,x,Y,z} is _____.

a) zYzwxY
b) zYzxwY
c) zYwzxY
d) zYzwYx

21. If "r1" and "r2" are regular expressions, then which of the following is not a regular expression?

a) r1 + r2
b) r1*
c) r1 r2
d) r1 – r2

22. Which of the following string belongs to the language of the regular expression (aa*b)*?

a) baabab
b) aabaab
c) aaaaaa
d) abbbaa

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23. Above given FA accepts the language in which strings

a) Begins with and ends in same letter
b) Begins with and ends in different letter
c) Has length more than 2
d) None of the given

24. GTG can have _____ final state.

a) 0
b) 1
c) More than 1
d) All of the given

25. In GTG, if a state has more than one incoming transitions from a state. Then all those incoming transitions can be reduced to one transition using _____ sign

a) -
b) +
c) *
d) None of the given

26. "One language can be expressed by more than one NFA". This statement is _____.

a) False
b) True
c) Depends on NFA
d) None of the given

27. One FA has 3 states and 2 letters in the alphabet. Then FA will have _____ number of transitions in the

diagram

a) 4

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b) 5
c) 7
d) 6

28. If an alphabet has n number of letter, then number of strings of length m will be

a) n+m
b) (n)(m)
c) m^n
d) n^m

29. FA of EVEN-EVEN language shows that it accepts the null string by declaring the _____ as a _____as well.

a) Initial state, final state
b) Initial sate, null state
c) Final state, initial state
d) Final state, null state

30. Let S = {a, bb, bab, baabb} be a set of strings, which one of the following will not be included in S*?

a) baba
b) bbbaabaabb
c) baabbabb
d) bbaaabb

31. The language of all strings defined over alphabet set = {x, y} that ends with different letters will have the maximum length of:

a) 1
b) 2
c) infinite

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d) 3

32. In an FA, when there is no path from the initial state to final state, then that FA_____.

a) accept all non empty strings
b) does not accept any string
c) accept all strings
d) accept null strings

33. There is no compulsion that each state must have an on outgoing edge for every input variable in:

a) Transition Graph
b) Transition Table
c) Both Finite Automata and Transition Graph
d) Finite Automata

34. In TG, there can be more than one _____.

a) start state only
b) null state only
c) start state and final state
d) final state only

35. Σ={a,Aa,Abb}, then string aAaAbbAa has length.

a) One
b) Two
c) Three
d) Four

36. Languages generated by kleene star are always

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a) Finite
b) Infinite
c) Sometimes finite & sometimes infinite
d) None of the these

37. Above given FA accepts

strings defined over Σ={a , b}

a) All
b) Some
c) All but not null
d) None of these

38. Every FA should be_____.

a) Deterministic
b) Non- Deterministic
c) Deterministic & Non- Deterministic
d) None of these

39. Auto Meta mean

a) Manual work
b) Automatic work
c) Both
d) None of these

40. NFA to FA will

a) Equal
b) Not equal
c) Not valid
d) None of given

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41. The length of output string in case of is one more than the length of corresponding input string.

a) Finite Automaton
b) TG
c) GTG
d) NFA

42. If a language is expressed through TG, then that language will have its RE.

a) True
b) False
c) Depends on language
d) None of these

43. In proving Kleene Theorem II, if a state has two incoming transition edges labelled by RE from the same state, then replace all the edges with a single transition edge labelled by ------- of corresponding RE.

a) Sum
b) Edge
c) FA
d) RE

44. If L1 and L2′ are regular languages, L1 ∩ (L2′ U L1′)' will be

a) Regular
b) Ir-regular
c) Can't be decided
d) Another Language which is not listed here

45. There _____ a language for which only FA can be built but not the RE.

a) is cannot be
b) is

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c) may be ok
d) may not be

46. For every three regular expressions R, S, and T, the languages denoted by R(S U T) and (RS) U (RT) are the _____ .

a) Same
b) Different
c) R(S U T) is Greater
d) None of the given options

47. In _____ there must be transition for all the lettersof a string.

a) NFA
b) GTG
c) TG
d) FA

48. We cannot construct an NFA for the language of _____ defined over alphabet set {a,b}.

a) Even
b) odd
c) Palindromes
d) Integers

49. Decomposing a string into its valid units is referred as:

a) Decomposing
b) Splitting
c) Tokenizing
d) Dividing

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50. Consider we have languages L7 and L6. Which of the following represents their concatenation?

a) L7+L6
b) L7/L6
c) L6L7
d) L7L6

51. Let FA1 has x number of states and FA2 has y number of states. Now FA1+FA2 can have maximum _____ number of states.

a) x+y
b) x-y
c) x/y
d) None

52. The language {a, ab, aba, bab} is _____ .

a) Irregular
b) Regular
c) Recursive
d) Infinite

53. Moore machine can have -------- final states.

a) 2
b) 4
c) 6
d) 8

54. There _____ be dead states in NFA.

a) may not
b) must

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c) should not
d) will

55. Let L be the language of all strings, defined over ∑ = {0,1}, ending in 10. Which of the following strings are distinguishable with respect to L with z being 0?

a) 010, 101
b) 111, 101
c) 001, 101
d) 111, 111

56. There _____ be a unique path for each valid string (called a word) in NFA.

a) May not
b) Must
c) Should not
d) Will

57. If we have only one state, having no transition for input letters, then it is an example of:

a) RE
b) FA
c) TG
d) NFA

58. Strings x,y,z belongs to Σ * such that xz ∈ L but yz ∉ L where L ⊆ Σ* are:

a) Undetermined
b) Distinguishable
c) Indistinguishable
d) Both distinguishable and indistinguishable

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59. A _____ with "n" states must accept at least one string of length greater than "n".

a) DFA
b) RE
c) Irregular language
d) Irrelevant language

60. In Moore machine, output is produced over the change of:

a) Transitions
b) Transitions and states
c) None of the mentioned
d) States

61. Every _____ can be considered to be _____ as well, but the converse may not be true.

a) TG, FA
b) GTG
c) PDA
d) FA, TG

62. In the context of make NFA for the concatenation of FA1 and FA2 (FA1 accepting null string), which of the following option is correct?

a) Final states in both FAs
b) Initial states in both FAs
c) FA2 having initial state only
d) FA2 having final state only

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63. In order to make NFA for the union of FA1 and FA2, the new initial state should be linked to:

a) Initial states of both FAs
b) Initial and final states of FA1 and FA2 respectively
c) Initial state of FA1 only
d) Final and initial states of FA1 and FA2 respectively

64. If we have an NFA having 3 states, and we convert that NFA to an FA.

The resultant FA will contains _____ states.

a) 1
b) 2
c) 3
d) 4

65. Let FA3 be an FA corresponding to FA1FA2, then initial state of FA3

must correspond to the initial state of

a) FA1 only
b) FA2 only
c) FA1 and FA2
d) FA1 or FA2

66. In which of the following machine, the length of output string is the same

to that of input string?

a) Mealy machine
b) Moore machine
c) Finite automaton with output
d) Non-deterministic finite automaton

67. In NFA having multiple transitions at certain state, FA can be built by introducing:

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a) Empty state
b) Combination of states
c) Initial state
d) Final state

68. In Mealy machine the output depends on _____

a) Present state and Present input
b) Only present state
c) Nothing
d) Type of input

69. If L is a regular language, then (L')' U L will be:

a) L
b) C
c) P
d) F

70. A string will be accepted by an NFA if there exists _____ one successful path.

a) Atleast
b) Atmost
c) Maximum
d) None of the given options

71. If A and B are regular languages, !(A' U B') is:

a) Non regular
b) May be regular
c) None of the mentioned
d) Regular

72. Every FA should be _____

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a) Deterministic
b) Non- Deterministic
c) Deterministic & Non- Deterministic
d) None of these

73. S= {a,bc,cc} has the latters

a) 1
b) 2
c) 3
d) 4

74. S={a,bb,bab,baabb} set of strings then S* will not have

a) baba
b) baabbab
c) bbaaabb
d) bbbaabaabb

75. One language can represents more than one RE.

a) True
b) Falss
c) Can't be assumed
d) Non of given

76. TG can more then one initial state

a) True
b) False
c) Depend on alphabets
d) None of given

77. The clouser FA*(star on an FA) always accept _____string

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a) Null
b) aa
c) bb
d) None of given

78. In FA final state represent by _____sign

a) +
b) -
c) =
d) *

79. In FA one enter in specific stat but there is no way to leave it then state is called

a) Dead States
b) Waste Baskets
c) Davey John Lockers
d) All of above

80. There is no question of accepting any language in:

a) Moore machine
b) FA
c) TG
d) GTG

81. Let FA3 be an FA corresponding to FA1FA2, then final state of FA3 must correspond to the final state of

a) FA2 only
b) FA1 only
c) FA1 or FA2
d) FA1 and FA2

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82. Subtraction of binary numbers is possible through:

a) Both complementing and incrementing machine
b) Complementing machine
c) Incrementing machine
d) Converting machine

83. For a given Moore Machine, the input string is '101010', thus the output string would be of length:

a) Length of input string + 1
b) Length of input string – 1
c) Length of input string + 2
d) Length of input string -2

84. Closure of an FA is the same as _____ of an FA with itself except that the initial state of the required FA is a final state as well.

a) Sum
b) Union
c) Intersection
d) Concatenation

85. Given the language L = {ab, aa, baa}, which of the following strings are inL*?

abaabaaabaa

aaaabaaaa

baaaaabaaaab

baaaaabaa

a) 1, 2 and 3
b) 2, 3 and 4
c) 1, 2 and 4

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d) 1, 3 and 4

86. FA and _____ are same except that _____ has unique symbol for each transition.

a) FA,TG
b) NFA,TG
c) NFA,FA
d) GTG,NFA

87. How many states of a finite automaton will be final for accepting the only string 'abb', if Σ= {a, b}?

a) 1
b) 2
c) 3
d) 4

88. Two machines are said to be equivalent if they print the output string when the input string is run on them.

a) Same, Same
b) Same, different
c) Different, same
d) Unique, different

89. Every NFA can be considered to be a -------- as well, but the converse may not be true.

a) TG
b) FA
c) GTG
d) PDA

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90. In which of the following machine, the length of output string is 1 more than that of input string?

a) Mealy machine
b) Non-deterministic finite automaton
c) Finite automaton with output
d) Moore machine

91. If S = {aa, bb} then S* will not contain _____.

a) abbbab
b) bbba
c) bbbbab
d) ababbb

92. If S = {a}, then S+ will be _____.

a) {a, aaa, aaaa, aaaaa,…}
b) {a, aa, aaa, aaaa,…}
c) {a, aaa, aaaaa, aaaaaaa,…}
d) {aa, aaaa, aaaaaa, aaaaaaaa,…}

93. Let's we have two regular expressions R1=(xx+yy) and R2=(x+ y). Which one of the following is the correct regular expression for the Union of R1 and R2?

a) (xx+yy)(x+y)
b) (xx+yy)+(x+y)*
c) (xx+yy)+(x+y)
d) ((xx+yy)+(x+y))*

94. The state where there is no way to leave after entry, is called _____.

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a) Davey John locker
b) initial state
c) final state
d) non-final state

95. Regular languages are closed under the following operations.

a) Union only
b) Concatenation, Closure only
c) Union, Concatenation and Closure ok
d) Regular languages are not closed under any operation

96. There can be more than _____ FA for a certain language but for _____ FA there is only one language associated with it.

a) one, one
b) one, two
c) two, three
d) two, one

97. There is one compulsion that each state must have an on outgoing edge forevery input variable in:

a) Finite Automata
b) Transition Graph
c) Both Finite Automata and Transition Graph
d) Transition Table

98. If r1 and r2 are regular expressions then (r1 * r2) is _____ .

a) FA
b) TG
c) GTG
d) RE

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99. Which of the following statements is true about NFA with Null String?

a) Infinite states
b) Infinite set of letters
c) Infinite set of transitions
d) Transition of null string is allowed at any stage

100. Which of the following diagrams expresses languages more simply?

a) FA
b) NFA
c) TG
d) GTG

101. If in an NFA, ∧ is allowed to be a label of an edge then that NFA is called _____.

a) Will not remain NFA
b) NFA with
c) NFA with null string
d) Either "NFA with null string" OR "NFA with "

102. Length of null string is

a) Always not equal to 0
b) Always equal to 0
c) It has variable length
d) All are true

103. Every finite language can be expressed by FA". This statement is _____.

a) True
b) False
c) Depends on language
d) None of these

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104. In FA, if one enters in a specific state but there is no way to leave it, then that specific state is called

a) Dead States
b) Waste Baskets
c) Davey John Lockers
d) All of these

105. In drawing FA3 (which is equal to FA1 + FA2), a state will be declared final if

a) States of both FA's are final
b) At least one state is final
c) Depends on language
d) None of the given

106. The _____ machine helps in building a machine that can perform the addition of binary numbers.

a) Incrementing
b) Complementing
c) Decrementing
d) None of the given

107. One FA has n states and m letters in the alphabet. Then FA will have _____ number of transitions in the diagram.

a) (n)+(m)
b) (m)(n) OR (n)(m)
c) None of the given options
d) (m)-(n)

108. If L1 and L2 are expressed by regular expressions r1 and r2, respectively then the language expressed by r1 + r2 will be _____

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a) Regular
b) Ir-regular
c) Can't be decided
d) Another Language which is not listed here

109. Which statement is true?

a) All words are strings
b) All strings are words
c) Both are always same
d) None of these

110. Alphabet S = {a,bc,cc} has _____ number of letters.

a) One
b) Two
c) Three
d) Four

111. The language of all strings defined over alphabet set = {a, b} that does not end with 'a' actually ends with:

a) b
b) b and ^
c) ^
d) ^ and a

112. In NFA having no transition at certain state, FA can be built by introducing:

a) Empty state
b) Combination of states
c) Initial state
d) Final state

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113. Formal is also known as

a) Syntactic language
b) Semantic language
c) Informal language
d) None of these

114. FA of EVEN language shows null string when

a) Initial state is final as well
b) EVEN does not accept null
c) One state is declared null
d) None of the these

115. Which of the following statement is true about GTG?

a) Transitions are based on input letters
b) Transitions are based on specified substrings
c) Transitions are based on regular expressions
d) Transitions are based on alphabet set

116. In GTG, there can be more than one:

a) Start state
b) Final state
c) Start state and final state
d) Null state

117. In regular expressions, the operator '*' stands for

a) Concatenation
b) Iteration
c) Selection
d) Add

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118. If r1 is a regular expression then (r1)* is

a) A generalized transition graph
b) A non-deterministic finite automaton
c) A finite automaton
d) Also, a regular expression

119. Kleene's theorem states that

a) All representations of a regular language are equivalent.
b) Finite Automata are less powerful than Pushdown Automata.
c) All representations of a context free language are equivalent.
d) All representations of a recursive language are equivalent

120. Kleene's Theorem Part I expresses the relationship between_____.

a) FA and TG
b) TG and RE
c) RE and FA
d) FA and RE

121. Null strings can be specified on edges in:

a) Finite Automata
b) Non-Deterministic Finite Automata
c) Transition Graph
d) Melay Machine

122. What is false about the PALINDROME LANGUAGE?

a) Every word is reverse of itself.
b) It is an infinite language.
c) FA can be build for it.
d) None of the given option

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123. All possible combinations of strings of a language including null string is referred as:

a) Concatenation of a language with itself
b) Kleene star closure of a language
c) Multiplication of language with itself
d) Addition of a language with itself

124. n! will be equal to:

a) n*n
b) n*(-n)!
c) n*(n-1)
d) n*(n-1)!

125. While finding RE corresponding to a TG, we connect the new start state with the old start state by _____ transition.

a) a
b) b
c) Null
d) RE

126. Considering FA1 and FA2 states each. Now FA1+FA2 can have maximum number of states.

a) 2
b) 3
c) More than 3
d) None of the given option

127. An _____ can be considered to be an intermediate structure between Finite automaton and Transition Graph.

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a) RE
b) GTG
c) NFA
d) None of the given options

128. In TG there may exist no paths for certain string.

a) True
b) False
c) Depends on the language
d) None of these

129. FA1 corresponds to r*, then FA1 must accept _____ string.

a) Every
b) Null
c) Odd length
d) Even length

130. FA1 and FA2 are two FA's representing two languages. Then FA3, which is sum of FA1 and FA2, will accept

the strings which are

a) Accepted by FA1 AND FA2
b) Accepted by FA1 OR FA2
c) Accepted by FA1 AND/OR FA2
d) None of the given options

131. a (a + b)* is the RE of language defined over S = {a, b} having at least one a

a) True
b) False
c) Such a language does not exist
d) None of the given options

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132. In which of the following language Rev(s)=s

a) EQUAL
b) INTEGER
c) PALINDROME
d) FACTORIAL

133. FA3 expresses r1r2. Then initial state of FA3 will consist of

a) Initial state of FA2
b) Initial state of FA1
c) Initial states of both FA1 & FA2
d) Depends on FA's

134. Two machines are said to be equivalent if they print the same output string when the different input string is run on them

a) True
b) False
c) Depends on language
d) May be or may not be

135. FA corresponding to an NFA can be built by introducing a state corresponding to the combination of states, for a letter having

a) No transition at certain state
b) One transition at certain state
c) Two transitions at certain state
d) More than two transitions at certain state

136. If S = { x }, then S* will be _____.

a) {^,x,xxx,xxxx,xxxxx,…}

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b) {^,x,xx,xxx,xxxx,…}
c) {^,x,xxx,xxxxx,xxxxxxx,…}
d) {^,xx,xxxx,xxxxxx,xxxxxxxx,…}

137. In TG, the string is supposed to be _____ if there is no path for a string from initial to final state.

a) Accept null string
b) Accept all strings
c) Accept all non-empty strings
d) Does not accept any string

138. Consider the following RE: a(a + b)b*

All of the following words are accepted except.

a) aab
b) abb
c) aa
d) aba

139. Two FAs are said to be equivalent, if they _____.

a) Accept null string
b) Accept same language
c) Accept different language
d) None of the given options

140. The operators like (* . +) in the parse tree are considered as

a) Terminals
b) Non-terminals
c) Productions
d) Intermediates

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141. Which one of the following languages is a non-regular language?

a) Even-even
b) Containing double a
c) Start and end with same letter
d) Palindrome

142. The values of input (say a & b) do not remain same in one cycle dueto

a) NAND gate
b) Clock pulse
c) OR gate
d) NOT gate

143. In a CFG, the non-terminals are denoted by

a) Small letters
b) Numbers
c) Capital letters
d) Small letters and numbers

144. Given S, Kleene star closure is denoted by

a) S*
b) S+
c) S-
d) None of these

145. The language having even number of a's and even number of b's defined over S = {a, b} is called _____.

a) EVEN-EVEN
b) ODD-ODD
c) PALINDROME
d) FACTORIAL

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146. In FA, initial state can be represented by:

a) Drawing an arrow head before that state
b) Drawing a circle in that state
c) leave the state empty
d) Drawing '+' sign in that state

147. In concatenation, we include the initial state of FA2 automatically after the final state of FA1 because of:

a) We need just two initial states
b) We need just one initial state
c) Some part of the string may be accepted by FA2
d) The strings of FA2 are accepted first before the strings of FA1

148. In the context of make NFA for the concatenation of FA1 and FA2 (FA2 accepting null string), which of the following option is correct?

a) Final states in both FAs
b) Initial states in both FAs
c) FA2 having final state only
d) FA2 having initial state only

149. Which of the following form correctly expressed the regular expression RR*?

a) R+
b) R-
c) R*
d) R+R-

150. Which of the following is not a step in elimination of states procedure?

a) Unifying all the final states into one using e-transitions

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b) Get the resulting regular expression by direct calculation
c) Remove states until there is only starting and accepting states
d) Unify single transitions to multi transitions that contains union of input

151. Let FA1 accepts many strings and FA2 accepts no string, then FA1+FA2 will be equal to:

a) FA1
b) FA2
c) (FA2)*
d) FA2-FA1

Best of Luck

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