CS402- THEORY OF AUTOMATA
(SOLVED MCQs)
FROM MIDTERM PAPERS
LECTURE (1-22)

ajtechinstitute24@gmail.com

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JUNAID MALIK (0304-1659294)

1. If an alphabet has "2" number of letters, then total number of strings of length "3" will be _____.
   - 5
   - 9
   - 8
   - 6
2. GTG for the expression (a+b)*bb may have minimum number of states:
   - 3
   - 4
   - 2
   - 1
3. Consider the Regular Expression (RE) a (a + b)b*. Which one of the following is NOT accepted by the provided RE?
   - aa
   - aab
   - aba
   - abb
4. Which of the following is NOT true about the term alphabet?
   - It is usually denoted by Greek letter sigma
   - It can be an empty set
   - Strings are generated by concatenating its elements
   - It is a finite set of symbols
5. Which of the following is free of non-determinism?
   - FA
   - TG
   - NFA
   - NFA-^
6. The language of all strings defined over alphabet set = {a, b} containing ‘bbb’ will have the minimum string with length of:
   - 1
   - 2
   - 3
   - 4
7. The aa(a+b)*bb is the RE of the language defined over Σ={a,b}.The language must _____.
   - have at least two ab
   - have at least one aa and one bb

- have at least one abbb
- have at least one ba

8. Reverse of string "YxwzYz" defined over Σ ={w,x,Y,z} is _____.
   - zYzwxY
   - zYzxwY
   - zYwzxY
   - zYzwYx
9. If "r1" and "r2" are regular expressions, then which of the following is not a regular expression?
   - r1 + r2
   - r1*
   - r1 r2
   - r1 – r2
10. Which of the following string belongs to the language of the regular expression (aa*b)*?
    - baabab
    - aabaab
    - aaaaaa
    - abbbaa
11. FA of EVEN-EVEN language shows that it accepts the null string by declaring the _____ as a _____as well.
    - Initial state, final state
    - Initial sate, null state
    - Final state, initial state
    - Final state, null state
12. Auto Meta mean
    - Automatic work
    - Manual work
    - Both
    - None of these
13. NFA to FA will
    - Equal Page 43
    - Not equal
    - Not valid
    - None of given
14. The length of output string in case of is one more than the length of corresponding input string.
    - Finite Automaton
    - TG
    - GTG
    - NFA
15. The machine helps in building a machine that can perform the addition of binary numbers.
    - Incrementing Page 60
    - Complementing
    - Decrementing

- None of the given

16. 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.
    - Sum
    - Edge
    - FA
    - RE
17. Kleene Theorem III states that if the language can be expressed by RE then there exist ------ accepting the language.
    - FA
    - DFA
    - NFA
    - None
18. If L1 and L2' are regular languages, L1 ∩ (L2' U L1')' will be
    - Regular
    - Ir-regular
    - Can't be decided
    - Another Language which is not listed here

19. A regular language can be:
    - irregular
    - infinite
    - non-deterministic
    - None of the given options
20. There _____ a language for which only FA can be built but not the RE.
    - is cannot be
    - is
    - may be
    - may not be
21. For every three regular expressions R, S, and T, the languages denoted by R(S U T) and (RS) U (RT) are the _____ .
    - Same
    - Different
    - R (S U T) is Greater
    - None of the given options
22. In _____ there must be transition for all the lettersof a string.
    - NFA
    - GTG
    - TG
    - FA
23. We cannot construct an NFA for the language of _____ defined over alphabet set {a,b}.
    - Even
    - odd
    - Palindromes

- Integers

24. Decomposing a string into its valid units is referred as:
    - Decomposing
    - Splitting
    - Tokenizing
    - Dividing
25. Choose the correct word produced by RE (a + b)* (aa+bb).
    - Abab
    - Babab
    - aaaa
    - Ab
26. Considering FA1 and FA2 having 2 states each. Now FA1+FA2 can have maximum _____ number of states.
    - 2
    - 3
    - more than 3
    - more than 2
27. There is no compulsion that each state must have an on outgoing edge for every input variable in:
    - Transition Graph
    - Transition Table
    - Both Finite Automata and Transition Graph
    - Finite Automata
28. In TG, there can be more than one _____.
    - start state only
    - null state only
    - start state and final state
    - final state only
29. Substrings as input letters can be specified on edges in:
    - NFA
    - PDA
    - FA
    - TG
30. If we have the regular expression (a + b)*, then we can draw FA for the provided RE with minimum _____ number of state(s).
    - 2
    - 0
    - 1
    - 3
31. Σ={a,Aa,Abb}, then string aAaAbbAa has length.
    - One
    - Two
    - Three
    - Four

32. Languages generated by Kleene star are always .
    - Finite
    - Infinite Page 7
    - Sometimes finite & sometimes infinite
    - None of these
33. Let S = {aa, bb}, then S* will have the _____ string.
    - Λ Page 7
    - abba
    - aabbbaa
    - bbaab
34. If r1 = (aa + bb) and r2 = (a + b) then the language (aa + bb)* will be generated by
    - (r1) (r2)
    - (r1 + r2)
    - (r2) *
    - (r1) *
35. If a language can be expressed through FA, then it can also be expressed through TG.
    - True Page 25
    - False
36. If an alphabet has n number of letter, then number of strings of length m will be
    - n+m
    - (n)(m)
    - m^n
    - n^m
37. 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
    - -
    - +
    - *
    - ( ) Page 27
38. Above given FA accepts strings defined over Σ={a , b}
    - All Page 15
    - Some
    - All but not null
    - None of these
39. One FA has 3 states and 2 letters in the alphabet. Then FA will have number of transitions in the diagram.
    - 4
    - 5
    - 7
    - 6 Page 14
40. Every FA should be_____.
    - Deterministic Page 25
    - Non- Deterministic
    - Deterministic & Non- Deterministic

- None of these

41. If R is a regular language and L is some language, and L U R is a _____, then L must be a _____.
    - Regular language
    - Finite Auto
    - Infinite Auto
    - Irregular language
42. The minimum length of the strings(except null string) of a language that starts and ends in different letters will be:
    - 1
    - 2
    - 3
    - 4
43. We have languages L7 and L6. Which of the following represents their concatenation?
    - L7+L6
    - L7/L6
    - L6L7
    - L7L6
44. Let FA1 has x number of states and FA2 has y number of states. Now FA1+FA2 can have maximum _____ number of states.
    - x+y
    - x-y
    - x/y
    - None
45. The language {a, ab, aba, bab} is _____ .
    - Irregular
    - Regular
    - Recursive
    - infinite
46. If we have a finite language and the number of states in the FA is n then the maximum number of letters in the each word of the language that will be accepted by the given FA will be:
    - N
    - n-1
    - n+1
    - 1
47. Moore machine can have -------- final states.
    - 2
    - 4
    - 6
    - 8
48. There _____ be dead states in NF
    - may not
    - must

- should not
- will

49. 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?
    - 010, 101
    - 111, 101
    - 001, 101
    - 111, 111
50. There _____ be a unique path for each valid string (called a word) in NF
    - May not
    - Must
    - Should not
    - Will
51. If we have only one state, having no transition for input letters, then it is an example of:
    - RE
    - FA
    - TG
    - NFA
52. Strings x,y,z belongs to Σ * such that xz ∈ L but yz ∉ L where L ⊆ Σ* are:
    - Undetermined
    - Distinguishable
    - Indistinguishable
    - Both distinguishable and indistinguishable
53. A _____ with "n" states must accept at least one string of length greater than "n".
    - DFA
    - RE
    - Irregular language
    - Irrelevant language
54. In Moore machine, output is produced over the change of:
    - Transitions
    - Transitions and states
    - None of the mentioned
    - States
55. Keeping in view the discussion by Martin, how many states are required to recognize the language of all strings of length 3 or more defined over ∑= {a,b}, with ‘a’ being the third letter from right?
    - 10
    - 12
    - 14
    - 16
56. Every _____ is a _____ as well, but the converse may not be true.
    - TG, FA
    - GTG
    - PDA

- FA, TG

57. In the context of make NFA for the concatenation of FA1 and FA2 (FA1 accepting null string), which of the following option is correct?
    - Final states in both FAs
    - Initial states in both FAs
    - FA2 having initial state only
    - FA2 having final state only
58. In order to make NFA for the union of FA1 and FA2, the new initial state should be linked to:
    - Initial states of both FAs
    - Initial and final states of FA1 and FA2 respectively
    - Initial state of FA1 only
    - Final and initial states of FA1 and FA2 respectively
59. Keeping in view the discussion by Martin, how many states are required to recognize the language of all strings of length 2 or more defined over ∑= {a,b}, with 'b' being the second letter from right?
    - 9
    - 6
    - 7
    - 8
60. If we have an NFA having 3 states, and we convert that NFA to an F The resultant FA will contains _____ states.
    - 1
    - 2
    - 3
    - 4
61. If S = {aa, bb} then S* will not contain _____.
    - abbbab
    - bbba
    - bbbbab
    - ababbb
62. Which of the following machine has only one initial state and no final state?
    - Moore machine
    - Finite state machine
    - A and B both
    - Deterministic finite state machine
63. Which of the following diagram is very rigid in order to express any language?
    - TG
    - NFA
    - GTG
    - FA
64. If S = {a}, then S+ will be _____.
    - {a, aaa, aaaa, aaaaa,…}
    - {a, aa, aaa, aaaa,…}

- {a, aaa, aaaaa, aaaaaaa,…}
- {aa, aaaa, aaaaaa, aaaaaaaa,…}

65. Let L be the language of all strings. defined over ∑ = {0,1}. ending in 111. Melay machine can have final states.
    - Zero
    - One
    - More than one but finite
    - More than one but infinite
66. 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?
    - (xx+yy)(x+y)
    - (xx+yy)+(x+y)*
    - (xx+yy)+(x+y)
    - ((xx+yy)+(x+y))*
67. The state where there is no way to leave after entry, is called _____.
    - Davey John locker
    - initial state
    - final state
    - non-final state
68. Which one of the following word is not accepted by the given regular expression?
    - aaabab
    - aaaababb
    - abbaab
    - aabbabb
69. According to theory of automata there are _____ types of languages.
    - One
    - Two
    - Three
    - Four
70. Regular languages are closed under the following operations.
    - Union only
    - Concatenation, Closure only
    - Union, Concatenation and Closure
    - Regular languages are not closed under any operation
71. There can be more than _____ FA for a certain language but for _____ FA there is only one language associated with it.
    - one, one
    - one, two
    - two, three
    - two, one
72. There is one compulsion that each state must have an on outgoing edge for every input variable in:
    - Finite Automata
    - Transition Graph

- Both Finite Automata and Transition Graph
- Transition Table

73. FA is also called
    - TG
    - GTG
    - NFA
    - DFA
74. If r1 and r2 are regular expressions then (r1 * r2) is _____ .
    - FA
    - TG
    - GTG
    - RE
75. Keep in view the language of all strings ending with 'a' defined over Σ = {a, b, c, d}. For which input letter, we will take a loop on the final state of its transition diagram?
    - a
    - b
    - c
    - d
76. Which of the following statements is true about NFA with Null String?
    - Infinite states
    - Infinite set of letters
    - Infinite set of transitions
    - Transition of null string is allowed at any stage
77. Introducing new start state in case of multiple start states is the step no. _____ of proving Kleene's theorem part II.
    - 1
    - 2
    - 3
    - 4
78. Which of the following diagrams expresses languages more simply?
    - FA
    - NFA
    - TG
    - GTG
79. The language of all strings defined over alphabet set = {a, b} that does not end with 'a' actually ends with:
    - b
    - b and ^
    - ^
    - ^ and a
80. In NFA having no transition at certain state, FA can be built by introducing:
    - Empty state
    - Combination of states
    - Initial state

- Final state

81. Formal is also known as
    - Syntactic language
    - Semantic language
    - Informal language
    - None of these
82. There may be more than one transition for a certain letter on a state in:
    - Finite automata
    - Non-Deterministic Finite Automata
    - Transition Table
    - Moore Machine
83. FA of EVEN language shows null string when
    - Initial state is final as well
    - EVEN does not accept null
    - One state is declared null
    - None of these
84. Which of the following statement is true about GTG?
    - Transitions are based on input letters
    - Transitions are based on specified substrings
    - Transitions are based on regular expressions
    - Transitions are based on alphabet set
85. In GTG, there can be more than one:
    - Start state
    - Final state
    - Start state and final state
    - Null state
86. GTG for the expression (aa+aba)* may have minimum number of states:
    - 1
    - 2
    - 3
    - 4
87. In regular expressions, the operator '*' stands for
    - Concatenation
    - Iteration
    - Selection
    - Add
88. If r1 is a regular expression then (r1)* is _____.
    - A generalized transition graph
    - A non-deterministic finite automaton
    - A finite automaton
    - Also, a regular expression
89. Which of the following is the bypass and state elimination step in the context of Kleene's theorem part II proof?
    - 1

- 2
- 3
- 4

90. Kleene's theorem states that
    - All representations of a regular language are equivalent.
    - Finite Automata are less powerful than Pushdown Automat
    - All representations of a context free language are equivalent.
    - All representations of a recursive language are equivalent
91. Melay machine to increase the output string in magnitude by 1 is called:
    - Complementing machine
    - Incrementing machine
    - Decrementing machine
    - Converting machine
92. Kleene's Theorem Part I expresses the relationship between_____.
    - FA and TG
    - TG and RE
    - RE and FA
    - FA and RE
93. Suppose we have FA3 (which is equal to FA1 + FA2), then the final state of FA3 will be declared final if:
    - It corresponds to final states of both FA1 and FA2
    - It corresponds to final states of FA1 only
    - It corresponds to final states of FA2 only
    - It corresponds to any of the final states in FA1 or FA2
94. Null strings can be specified on edges in:
    - Finite Automata
    - Non-Deterministic Finite Automata
    - Transition Graph
    - Melay Machine
95. What is false about the PALINDROME LANGUAGE?
    - Every word is reverse of itself.
    - It is an infinite language.
    - FA can be build for it.
    - None of the given option
96. While finding RE corresponding to TG, If TG has more than one start state then
    - Introduce the new start state
    - Eliminate the old start state
    - Replace the old start stat with final state
    - Replace the old final state with new start state
97. All possible combinations of strings of a language including null string is referred as:
    - Concatenation of a language with itself
    - Kleene star closure of a language
    - Multiplication of language with itself
    - Addition of a language with itself

98. n! will be equal to:
    - n*n
    - n*(-n)!
    - n*(n-1)
    - n*(n-1)!
99. While finding RE corresponding to a TG, we connect the new start state with the old start state by _____ transition.
    - a
    - b
    - Null
    - RE
100. In proving Kleene Theorem II, if three states are connected then middle state is removed by connecting first and third state and writing corresponding RE in:
    - Sum
    - Concatenation
    - Difference
    - Asterisk
101. In there must be transition for all the letters of a string.
    - NFA
    - GTG
    - TG
    - FA
102. There is no accepting any language in:
    - FA
    - TG
    - GTG
    - Moore machine
103. The FA can be drawn for the regular expression (a+b)* with minimum state(s).
    - 1
    - 2
    - 3
    - 4
104. Which of the following does not contribute while finding out the length of strings?
    - ^
    - a
    - b
    - a+b
105. The language of all strings defined over alphabet set = {x, y} that ends with same letters will have the maximum length of:
    - 1
    - 2
    - 3
    - Infinite

106. Considering FA1 and FA2 states each. Now FA1+FA2 can have maximum number of states.
- 2
- 3
- More than 3
- None of the given option

107. Which one of the following is the RE for the language defined over Σ= {a, b} having all the words starting with a?
- (a + b)*
- aa(a + b)+
- a(a + b)*
- a*(a + b)

108. An _____ can be considered to be an intermediate structure between Finite automaton and Transition Graph.
- RE
- GTG
- NFA
- None of the given options

109. Suppose a language L1 has 2 states and L2 has 2 states. If we have a machine M that accepts L1 ∩ L2. Then, the total number of states in M is equal to _____.
- 2
- 4
- 6
- 8

110. FA corresponding to an NFA can be built by introducing a state corresponding to the combination of states, for a letter having
- No transition at certain state
- One transition at certain state
- Two transitions at certain state
- More than two transitions at certain state

111. Automata is the plural of _____.
- Automate
- Automaton
- Automation
- Automatic

112. In NFA having no transition at certain. FA can be built by introducing:
- Empty state
- Combination of states
- Initial state
- Final state

113. If S = { x }, then S* will be _____.
- {^,x,xxx,xxxx,xxxxx,...}
- {^,x,xx,xxx,xxxx,...}
- {^,x,xxx,xxxxx,xxxxxxx,...}

- {^,xx,xxxx,xxxxxx,xxxxxxxx,…}

114. In TG, the string is supposed to be _____ if there is no path for a string from initial to final state.
- Accept null string
- Accept all strings
- Accept all non-empty strings
- Does not accept any string

115. In Moore machine, if the length of input string is 9, then the length of output string will be:
- 7
- 8
- 9
- 10

116. When ODD language is expressed by an FA, then it will have minimum _____ states.
- One
- Two
- Three
- Four

117. [(a + b)(a + b)]*, given RE cannot generate the string _____.
- abbaabab
- abbbaa
- bbbbbb
- abbbaaaaa

118. The recursive method for defining a language has _____ steps.
- One
- Two
- Three
- Four

119. Consider the following RE: a(a + b)b* All of the following words are accepted except .
- aab
- abb
- aa
- aba

120. For every three regular expressions R, S, T, the languages denoted by R(S U T) and (RS) U (RT) are the .
- Same
- Different
- R(S U T) is greater
- None of the given options

121. Alphabet S = {a, bc, cc} has number of letters.
- One
- Two

- Three
- Four

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

- Accept null string
- Accept same language
- Accept different language
- None of the given options

123. ---------- can also help in proving Kleene Theorem III.

- NFA
- PDA
- Moore machine
- Melay machine

124. Kleene's Theorem Part II expresses the relationship between _____.

- FA and TG
- TG and RE
- RE and FA
- FA and RE

125. If two RE's generate same language then these RE's are called _____.

- Same RE
- Equal RE
- Similar RE
- Equivalent RE

126. Every FA should be .

- Deterministic
- Non-deterministic
- Deterministic and non-deterministic
- Not depends on language

127. What statement is true?

- A letter is always a combination of symbols
- A letter may consist of one symbol
- There is no difference between symbol and letter
- Letters and symbols are the same thing

128. If ∑= {ab, bb}, then ∑* will not contain

- abbbab
- bbba
- bbbbab
- ababbb

129. Choose the correct word produced by RE (a + b)*a

- abb
- abab
- bbbb
- aaaa

130. According to 1st part of the Kleene's theorem, If a language can be accepted by an FA then it can be accepted by a as well

- FA
- CFG
- GTG
- TG

131. "One language can be expressed by GTG".
- Only one
- Only two
- More than one
- None of these

132. If a TG has more than one start states, then we can make a single start state by introducing a new state and connecting it with all the previously existing start states by using .
- Any infinite string
- Single letter string
- Null string
- Any finite string

133. If in a NFA, ^ is allowed to be a label of an edge then that NFA is called .
- TG
- RE
- NFA with null string
- RE

134. If we want to make a Moore machine equivalent to mealy machine then
- We should ignore the extra character printed by the Moore machine.
- We should ignore the extra character printed by the Mealy machine.
- We will make the initial state as a no carry state.
- We should not ignore the extra character printed by the Moore machine.

135. Let FA3 be an FA corresponding to FA1FA2, then initial state of FA3 must correspond to the initial state of
- FA1 only
- FA2 only
- FA1 and FA2
- FA1 or FA2

136. In which of the following machine, the length of output string is the same to that of input string?
- Mealy machine
- Moore machine
- Finite automaton with output
- Non-deterministic finite automaton

137. Moore Machine is an application of:
- None of the mentioned
- Finite automata with output
- Finite automata without input
- Non- Finite automata with output

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

- Empty state
- Combination of states
- Initial state
- Final state

139. In Mealy machine the output depends on _____ .
- Present state and Present input
- Only present state
- Nothing
- Type of input

140. If L is a regular language, then (L')' U L will be:
- L
- C
- P
- F

141. A string will be accepted by an NFA if there exists _____ one successful path.
- At least
- At most
- Maximum
- None of the given options

142. If A and B are regular languages, !(A' U B') is:
- Non regular
- May be regular
- None of the mentioned
- Regular

143. There is no of accepting any language in:
- Moore machine
- FA
- TG
- GTG

144. In _____ there must be transitions for all the alphabets over which a language is define
- FA
- TG
- NFA
- GTG

145. Let FA3 be an FA corresponding to FA1FA2, then final state of FA3 must correspond to the final state of
- FA2 only
- FA1 only
- FA1 or FA2
- FA1 and FA2

146. How many new states are introduced while developing NFA for the closure of an FA?
- 2

- 4
- 6
- 8

147. Subtraction of binary numbers is possible through:
- Both complementing and incrementing machine
- Complementing machine
- Incrementing machine
- Converting machine

148. Moore Machine, the input string is '101010', thus the output string would be of length:
- Length of input string + 1
- Length of input string – 1
- Length of input string + 2
- Length of input string -2

149. Which one of the following machine is represented as a pictorial representation with states and directed edges labeled by an input letter along with an output character?
- Mealy machine
- Moore machine
- Finite state machine
- Deterministic finite state machine

150. If FA1 corresponds to (a+b)* then FA1 must accept _____ string/strings.
- No
- Odd length
- Even length
- Every

151. 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.
- Sum
- Union
- Intersection
- Concatenation

152. Given the language L = {ab, aa, baa}, which of the following strings are in L*?
abaabaaabaa
aaaabaaaa
baaaaabaaaab
baaaaabaa
- 1, 2 and 3
- 2, 3 and 4
- 1, 2 and 4
- 1, 3 and 4

153. FA and _____ are same except that _____ has unique symbol for each transition.
- FA, TG
- NFA, TG

- NFA, FA
- GTG, NFA

154. How many states of a finite automaton will be final for accepting the only string 'abb', if Σ= {a, b}?
- 1
- 2
- 3
- 4

155. Two machines are said to be equivalent if they print the output when the input string is run on them.
- Same, Same
- Same, different
- Different, same
- Unique, different

156. Every NFA can be considered to be a -------- as well, but the converse may not be true.
- TG
- FA
- GTG
- PDA

157. In which of the following machine, the length of output string is 1 more than that of input string?
- Mealy machine
- Non-deterministic finite automaton
- Finite automaton with output
- Moore machine

158. The length of output in case of is one more than the length of corresponding input string
- Moore machine
- Mealy machine
- Incremental machine
- Adding machine

159. A is not a valid transition in
- TG
- GTG
- NFA
- RE

160. Dead states are also called
- John Davey Lockers
- Davey John Lockers
- Mutex Lockers
- Semaphores

161. Language of all strings whose length is odd and number of y's is even defined over alphabet set Σ = {x, y}. _____ will be accepted by the given language.

- xxyxyxyyyx
- xxyxyxyyyxy
- xxyxyxyyyxx
- xxyxyxyyy

162. If an effectively solvable problem has answer in Yes or NO. then the solution is called
- Infinite problem
- Decision procedure
- Finite solution
- Optimal procedure

163. If the intersection of two regular languages is regular then the complement of the intersection of these two languages is
- Regular
- Irregular
- Irregular but finite
- Irregular but infinite

164. If R is regular language and Q is any language (regular/non-regular). Then Pref(in) is regular.
- Q, Q
- Q, R
- R, Q
- R, R

165. The strings or words which do not belong to a language are called of that language
- Intersection
- Union
- Complement
- Quotient

166. Prime is a language.
- Finite
- Both context free and regular
- Regular
- Non-regular

167. Finite Automaton (FA) must have number of states while a language has words.
- Infinite, finite
- Finite, finite
- Finite, infinite
- Infinite, infinite

168. The language “PRIME” is an example of language.
- Regular but finite
- Regular
- Non regular but finite
- Non regular

169. If L1 and L2 are regular languages then which statement is NOT true?
- L1 + L2 is always regular

- L1 L2 is always regular
- L1/L2 is always regular
- L1* is always regular

170. If a language is regular it must generate number of distinct classes.
- Finite
- Infinite
- Two
- three

171. The operators like (* . +) in the parse tree are considered as
- Terminals
- Non-terminals
- Productions
- Intermediates

172. Set of all palindromes over {a,b} is:
- Regular
- Regular and finite
- Regular and infinite
- Non-regular

173. Which one of the following languages is a non-regular language?
- Even-even
- Containing double a
- Start and end with same letter
- Palindrome

174. The languages of all strings partition ∑* into class(es).
- One
- Two
- Three
- Four

175. The language of all strings not beginning with 'b' partitions ∑* into distinct classes.
- Two
- Three
- Four
- Five

176. The values of input (say a & b) do not remain same in one cycle due to
- NAND gate
- Clock pulse
- OR gate
- NOT gate

177. In a CFG, the non-terminals are denoted by
- Small letters
- Numbers
- Capital letters
- Small letters and numbers

178. a* + b* = (a + b)* this expression is

- True
- False

179. Length of EVEN-EVEN language is always_____.
- Even
- Odd
- Sometimes even & sometimes odd
- Such language doesn't exist

180. While finding RE corresponding to TG, we connect the new start state to the old start state by the transition labeled by
- a
- b
- null
- none of the given options

181. Given S, Kleene star closure is denoted by _____.
- S*
- S+
- S-
- None of these

182. Which of the following steps replaces multiple incoming transition edges with a single one in proving Kleene's theorem part ||?
- 1
- 2
- 3
- 4

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

184. The language having even number of a's and even number of b's defined over S = {a, b} is called _____.
- EVEN-EVEN
- ODD-ODD
- PALINDROME
- FACTORIAL

185. If L1' and L2' are regular languages. Then L1,L2 will be
- Regular
- Non regular
- May be regular
- None of the mentioned

186. f FA1 corresponding to (a+b)* then FA1 must accept string/strings
- No
- Odd length

- Even length
- Every

187. In FA, initial state can be represented by:
- Drawing an arrow head before that state
- Drawing a circle in that state
- leave the state empty
- Drawing '+' sign in that state

188. An FA is a collection of:
- Finite states, finite transition and finite input letters
- Infinite states, infinite transition and infinite input letters
- Only finite states and finite transitions
- Only infinite states and infinite transitions

189. NFA with null string has ---------- initial state(s).
- One
- Two
- Four
- Three

190. The difference between number of states with regular expression (a + b) and (a + b)* is:
- 0
- 1
- 2
- 3

191. A transition graph is converted into a(n) _____ in order to obtain regular expression.
- FA
- GTG
- NFA
- NFA

192. Consider the languages L1 = and L2 = {a}. Which one of the following represents L1 L2* U L1*
- ^
- a*
- All of the mentioned
- None of the mentioned

193. If S = {a, b} then which of the following RE will generate all possible strings?
- a* + b*
- (ab)*
- (a + b) *
- (ab + ba) *

194. In drawing FA3 (which is equal to FA1 + FA2), a state will be declared final if
- It corresponds to final states of both FA1 and FA2
- It corresponds to final states of FA1
- It corresponds to final states of FA2

- It corresponds to any of the final states in FA1 or FA2

195. Let S = {a, bb, bab, baabb} be a set of strings, which one of the following will not be included in S*?
- baba
- baabbabb
- bbaaabb
- bbbaabaabb

196. The length of string “AbBAbcd” defined over Σ ={Ab,B,c,d} is _____.
- One
- Two
- Five
- Four

197. In case of finite automaton there _____ be a transition on each _____ for every letter of the alphabet set.
- Must, state
- May be, state
- Often, edge
- Must, edge

198. Which one of the following word is not accepted by the given regular expression? (a+b)*(aaa+bbb)(a+b)*
- Ababaaaab
- Bababbbba
- Baabaabba
- Abbaaabba

199. 1 Let FA1 accepts many strings and FA2 accepts none then FA1+FA2 will be equal to:
- FA1
- FA2
- FA2-FA1
- (FA2)

200. Edges are expressed with a regular expression in:
- GTG
- FA
- NFA
- TG

201. NFA corresponding to union of FAs is built by introducing a new start state and connect it to the states originally connected to the old start state with the --------- transitions as the old start state:
- Same
- Union of
- Different
- Concatenated

202. If we subtract a binary number 1010 from the binary number 1101(ignore the overflow), then the result will be:

- 1100
- 0011
- 1010
- 0101

203. In concatenation, we include the initial state of FA2 automatically after the final state of FA1 because of:
- We need just two initial states
- We need just one initial state
- Some part of the string may be accepted by FA2
- The strings of FA2 are accepted first before the strings of FA1

204. a(a+b)*b + b(a+b)*a is the regular expression of language defined over Σ={a,b} that is _____.
- starting with b and ending in a
- starting with a and ending in a
- starting with a and ending in b
- starting with a and ending in b or starting with b and ending in a

205. GTG for the expression (a+b)*bb may have minimum number of states:
- Aaabcbbcbacc
- Bbbacaacabcc
- Cccbabbcabcc
- Acbdcbababab

206. Which of the following state is introduced while developing NFA for the closure of an FA?
- Final state
- Simply an initial state
- An initial state with loop for all letters
- An initial state which should be final as well

207. In NFA,if null word (lambda) is allowed to be a label of an edge, then that NFA is called _____.
- NFA with one string
- NFA with two strings
- NFA with null string
- NFA without null string

208. Which one of the following is a correct word produced by the RE (a*b*)ab?
- Null
- Abab
- aaaa
- bbbb

209. While developing NFA for the union of FA1 and FA2, if there is a loop of ‘a’ at the initial state of FA1 then the new initial state will have a transition for ‘a’ that goes straight to:
- the final state of FA1
- The initial state of FA1
- the initial state of FA2

- the initial state of FA1*FA1

210. Let L be the language of all strings, defined over Σ = {0,1}, ending in 111. Which of the following strings are distinguishable with respect to L with z being 11?

- 111, 101
- 112, 102
- 113, 103
- 114, 104

211. Which one of the following word is not accepted by the given regular expression?

- Abbbbaa
- Baaaabb
- Cbbbbcc
- Caaaacc

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

- FA2 only
- FA1 only
- FA1 or FA2
- FA1 and FA2

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

- FA1 only
- FA2 only
- FA1 or FA2
- FA1 and FA2

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

- Final states in both FAs
- Initial states in both FAs
- FA2 having final state only
- FA2 having initial state only

215. In the context of make NFA for the concatenation of FA1 and FA2 (none accepting null string), which of the following option is correct?

- No final state in FA2 only
- No initial state in FA1 only
- No final and initial states in FA1 and FA2 respectively
- No initial and final states in FA1 and FA2 respectively

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

- FA1
- FA2
- (FA2) *
- FA2-FA1

217. The minimum length of the strings(except null string) of a language that starts and ends in the same letters will be:

- 1
- 2
- 3
- 4

218. While developing NFA for the union of FA1 and FA2, there will be _____ transition/transitions for both 'a' and 'b' on the new initial state.
- Single
- Multiple
- Only one
- Only three

219. Which of the following form correctly expressed the regular expression RR*?
- R+
- R-
- R*
- R+R-

220. Which of the following is not a step in elimination of states procedure?
- Unifying all the final states into one using e-transitions
- Get the resulting regular expression by direct calculation
- Remove states until there is only starting and accepting states
- Unify single transitions to multi transitions that contains union of input

221. In the context of make NFA for the concatenation of FA1 and FA2 (Both FAs accepting null string), which of the following option is correct?
- Initial states in both FAs
- Final states in both FAs
- FA2 having initial state only
- FA2 having final state only

222. In FA, final state is represented by a _____ sign.
- -
- =
- *
- +

223. If we have the regular expression (a+b)* (aaa + bbb) (a+b)*, then we can draw a TG for the provided RE with minimum _____ number of state(s).
- two
- zero
- one
- three

224. Suppose we have the regular expression: aa(a+b+c)*bb(a+b+c)*cc Which of the following string will not be generated by the given RE?
- aabbcc
- aaaabbccbc
- aaabcbbcbacc
- aaabbbbccc

225. If an FA has 3 states and 2 letters in the alphabet set, then it will have total _____ number of transitions.

- 7
- 4
- 6
- 5

226. Which one of the following string is a part of EQUAL language defined over Σ={a,b}?

- aabbaa
- aabbbaa
- ababab
- babab

227. Which one of the following word is not accepted by the given regular expression?aa(a+b)*b

- Aabbabb
- Abbaab
- Aaabab
- aaaababb

228. Which of the following statement is NOT true about TG?

- There may exist NULL path
- There may be no final state
- There exists exactly one path for certain string
- There may exist more than one paths for certain string

229. Kleene's Theorem Part III expresses the relationship between _____.

- RE and FA
- FA and GTG
- TG and RE
- FA and TG

230. When even length language is expressed by an FA, then it will have minimum_____ states.

- One
- Two
- Three
- Four

231. Which one of the following word is not accepted by the given regular expression?(a+b)*bba(a+b)*

- Aaababab
- Babbba
- Abbbbaa
- bbabbbbaba

232. FA stands for _____.

- Fixed Automaton
- Finite Automaton
- False Automaton
- Functional Automaton

233. FA corresponding to an NFA can be built by introducing an empty state for a letter having
- no transition at certain state
- one transition at certain state
- two transitions at certain state
- more than two transitions at certain state

234. In order to make NFA for the union of FA1 and FA2, the final state/ states of:
- both FAs should be linked
- both FAs should be left intact
- FA1 have a transition to the final state of FA2
- FA2 have a transition to the final state of FA1

235. 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:
- Only initial state of FA1
- Final state of FA2
- Only initial state of FA2
- Initial state of FA1 or FA2

236. Introducing new final state in case of multiple final states is the step no. _____ of proving Kleene's theorem part II.
- 4
- 1
- 2
- 3

237. In proving Kleene Theorem II, circuits are reduced into:
- asterisk
- difference
- both difference and asterisk
- sum

238. Finite Automaton (FA) has:
- Zero or more final states
- Exactly one final state
- Not more than two final states
- Exactly two final states

239. The formal language is also known as _____.
- Semantic language
- Informal language
- Syntactic language
- Normal language

240. 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:
- 1
- 3
- 4
- 2

241. The language of all strings defined over alphabet set = {x, y} that ends with different letters will have the maximum length of:
- 1
- 2
- infinite
- 3

242. In an FA, when there is no path from the initial state to final state, then that FA_____.
- accept all non-empty strings
- does not accept any string
- accept all strings
- accept null strings

243. If Σ= {a, b, c, d}. How many transitions will be there on each state of a finite automaton for any language defined over Σ?
- 2
- 4
- 1
- 3

244. Which of the following is the minimal number of states for a finite automaton accepting the language of all strings defined over any alphabet set?
- 3
- 4
- 2
- 1

245. How many states of a finite automaton will be final for accepting L = {^, b, bb, bbb}?
- 3
- 1
- 4
- 2