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CS402 Grand Quiz (Screenshots) Mega File

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

- 1
- 2
- 3
- 4

2. If $S = \{ab, bb\}$ then S^* will not contain _____.

- abbbab
- **bbba**
- bbbbab
- ababbb

3. Which of the following machine has only one initial state and no final state?

- **Moore machine**
- Finite state machine
- Deterministic finite state machine

- Non deterministic finite state machine

4. Which of the following diagram is very rigid in order to express any language?

- TG
- NFA[^]
- GTG
- **FA**

5. If $S = \{a\}$, then S^+ will be _____

- $\{a, aaa, aaaa, aaaaa, \dots\}$
- **$\{a, aa, aaa, aaaa, \dots\}$**
- $\{a, aaa, aaaaa, aaaaaaa, \dots\}$
- $\{aa, aaaa, aaaaa, aaaaaaa, \dots\}$

6. Let L be the language of all strings. defined over $\Sigma = \{0,1\}$. ending in 111.

Which of the following strings are indistinguishable with respect to L with z being 11?

- **111, 101**
- 100, 101
- 110, 101
- 010, 101

7. Melay machine can have ----- final states.

➤ **Zero**

➤ One

➤ More than one but finite

➤ More than one but infinite

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

➤ Transitions

➤ **States**

➤ Transitions and states

➤ None of the mentioned

9. Given the language $L = \{ab, aa, baa\}$, which of the following strings are in

L^* ?

1) abaabaaabaa

2) aaaaaaaaa

3) baaaaabaaaab

4) baaaaabaa

➤ 1, 2 and 3

➤ 2, 3 and 4

➤ **1, 2 and 4**

- 1, 3 and 4

10. Let L be the language of all strings, defined over $\Sigma = \{0,1\}$, ending in 10.

Which of the following strings are distinguishable with respect to L with z being 0?

- 111, 101
➤ 001, 101
➤ 111, 111
➤ **010, 101**

11. 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 $R2$?

- $(xx+yy)(x+y)$
➤ $(xx+yy)+(x+y)^*$
➤ **$(xx+yy)+(x+y)$**
➤ $((xx+yy)+(x+y))^*$

12. 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
- more than one transitions at certain state
- none of the given options

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

- **Davey John locker**
- initial state
- final state
- non-final state

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

- aaabab
- aaaababb
- **abbaab**
- aabbabb

15. 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

16. According to theory of automata there are _____ types of languages

➤ One

➤ **Two**

➤ Three

➤ Four

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

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

➤ ababaaaab

➤ bababbbba

➤ **baabaabba**

➤ abbbaabba

18. 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.

19. If $S = \{x\}$, then S^* will be _____.

- $\{\wedge, x, xxx, xxxxx, xxxxxx, \dots\}$
- $\{\wedge, x, xx, xxx, xxxxx, \dots\}$
- $\{\wedge, x, xxx, xxxxxx, xxxxxxxx, \dots\}$
- $\{\wedge, xx, xxxxx, xxxxxxxx, xxxxxxxxxx, \dots\}$

20. 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

21. There is one compulsion that each state must have an outgoing edge for every input variable in:

- Finite Automata
- **Transition Graph**
- Both Finite Automata and Transition Graph
- Transition Table

22. FA is also called

- TG
- GTG
- NFA
- **DFA**

23. In the context of making NFA for the concatenation of FA1 and FA2 (Both FAs accepting null string), which of the following options is correct?

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

24. If r_1 and r_2 are regular expressions then $(r_1 * r_2)$ is _____

- FA
- TG
- GTG
- **RE**

25. 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?

- **1**

➤ 2

➤ 3

➤ 4

26. Keeping in view the language of all strings ending with 'a', for which symbol we will take a loop on the final state of its transition diagram?

➤ **a**

➤ b

➤ c

➤ d

27. 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**

28. Introducing new start state in case of multiple start states is the step no.

_____ of proving Kleene's theorem part ||.

➤ **1**

➤ 2

➤ 3

➤ 4

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

- FA
- NFA
- TG
- **GTG**

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

- b
- **b and Λ**
- Λ
- Λ and a

31. Let L be the language of all strings, defined over $\Sigma = \{0,1\}$, ending in 10.

Which of the following strings are indistinguishable with respect to L with z being 0?

- 100, 101
- **111, 101**
- 110, 101
- 010, 101

32. Let $S = \{aa, bb\}$, then S^* will have the ____ string.

- Λ

- abba
- aabbbbaa
- bbaab

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

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

34. Formal is also known as _____

- **Syntactic language**
- Semantic language
- Informal language
- None of these

35. 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

36. A loop at a state is supposed to be ----- transition while converting Moore machine into an equivalent Melay machine.

- **Incoming**
- Outgoing
- Both incoming and outgoing
- Complex

37. 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 the these

38. 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

39. 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?

- Moore machine
- **Mealy machine**
- Finite state machine
- Deterministic finite state machine

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

- Start state
- Final state
- **Start state and final state**
- Null state

41. GTG for the expression $(aa+aba)^*$ may have minimum number of states:

- **1**
- 2
- 3
- 4

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

- **Concatenation**
- Iteration
- Selection
- Addition

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

- RE
- FA
- TG
- **NFA**

44. If A and B are regular languages, $!(A' \cup B')$ is:

- **Regular**
- Non regular
- May be regular
- None of the mentioned

45. A _____ with “n” states must accept at least one string of length greater than “n”.

- **DFA**
- RE
- Irregular language
- Irrelevant language

46. If r_1 is a regular expression then $(r_1)^*$ is _____.

- A generalized transition graph
- A non-deterministic finite automaton

- A finite automaton
- **Also a regular expression**

47. 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**

48. Every _____ is a _____ as well, but the converse may not be true.

- TG, FA
- **FA, TG**
- TG, GTG
- FA, GTG

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

- TG
- **FA**
- NFA
- NFA- $\wedge$

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

- FA
- TG
- GTG

➤ **Moore machine**

51. There state where there is no way to leave after entry is called ____.

➤ **Davey john locker**

- Initial state
- Final state
- Non-final state

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

➤ **Atleast**

- Atmost
- Maximum
- None of the given options

53. Melay machine to increase the output string in magnitude by 1 is called:

- Complementing machine
- **Incrementing machine**
- Decrementing machine

- Converting machine

54. Kleene's Theorem part | expresses the relationship between ____.

- **FA and TG**

- TG and RE

- RE and FA

- FA and RE

55. 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 $\Sigma = \{a,b\}$, with 'b' being the second letter from right?

- 6

- **7**

- 8

- 9

56. 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**

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

- FA, TG
- NFA, TG
- **NFA, FA**
- GTG, NFA

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

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

59. Subtraction of binary numbers is possible through:

- Complementing machine
- Incrementing machine
- **Both complementing and incrementing machine**
- Converting machine

60. Null strings can be specified on edges in:

- Finite Automata
- Non-Deterministic Finite Automata

➤ **Transition Graph**

➤ **Melay Machine**

61. 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**

62. 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

63. 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

64. $n!$ will be equal to:

- $n*n$
- $n*(-n)!$
- $n*(n-1)$
- **$n*(n-1)!$**

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

- FA
- **TG**
- GTG
- PDA

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

- a
- b
- **Null**
- RE

67. In proving Kleene Theorem ||, 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

68. In _____ there must be transition for all the letters of a string.

- NFA
- GTG
- TG
- **FA**

69. There is no question accepting any language in:

- FA
- TG
- GTG
- **Moore machine**

70. For a given 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

71. The FA can be drawn for the regular expression $(a+b)^*$ with minimum _____ state(s).

- **1**
- 2
- 3
- 4

72. Which of the following does not contribute while finding out the length of strings?

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

73. 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**

74. 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**

75. Which one of the following is the RE for the language defined over $\Sigma = \{a, b\}$ having all the words starting with a?

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

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

- RE
- GTG
- **NFA**
- None of the given options

77. Given the language $L = \{ab, aa, baa\}$, which of the following strings are in L^* ?

- 1) abaabaaaabaa
 - 2) aaaabaaaa
 - 3) baaaaabaaaab
 - 4) baaaaabaa
- 1, 2 and 3
 - 2, 3 and 4
 - **1, 2 and 4**
 - 1, 3 and 4

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

- Initial and final states of FA1 and FA2 respectively

➤ **Initial states of both FAs**

- Initial state of FA1 only
- Final and initial states of FA1 and FA2 respectively

79. We cannot construct an NFA for the language of ____ defined over alphabet set $\{a,b\}$.

- Even even
- Odd

➤ **Palindromes**

- Integers

80. FA and ____ are same except that ____ has unique symbol for each transition.

- FA, TG
- NFA, TG

➤ **NFA, FA**

- GTG, NFA

81. If L is regular language, then $(L')' \cup L$ will be:

- L
- L'
- Λ

- None of the mentioned

82. Suppose a language L_1 has 2 states and L_2 has 2 states. If we have a machine M that accepts $L_1 \cap L_2$. Then, the total number of states in M is equal to _____

- 2
- 4
- 6
- 8

83. If L_1 and L_2' are regular languages. $L_1 \cap (L_2' \cup L_1)'$ will be

- **Regular**
- Non regular
- May be regular
- None of the mentioned

84. In mealy machine the output depends on _____

- Only present state
- **Present state and Present input**
- Nothing
- Type of input

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

- FA
- Moore machine

- Melay machine
- **Both moore and melay machine**

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

- **Davey John Locker**

- Initial state
- Final state
- Non-final state

87.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

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

- FA
- NFA
- TG
- **GTG**

89.Automata is the plural of _____.

- Automate

➤ **Automaton**

- Automation
- Automatic

90. If A and B are regular languages. $!(A' \cup B')$ is:

➤ **Regular**

- Non regular
- May be regular
- None of the mentioned

91. In NFA having no transition at certain. FA can be built by introducing:

➤ **Empty state**

- Combination of states
- Initial state
- Final state

92. If $S = \{x\}$, then S^* will be _____.

- $\{\wedge, x, xxx, xxxxx, xxxxxx, \dots\}$
- **$\{\wedge, x, xx, xxx, xxxxx, \dots\}$**
- $\{\wedge, x, xxx, xxxxxx, xxxxxxxx, \dots\}$
- $\{\wedge, xx, xxxxx, xxxxxxxx, xxxxxxxxxx, \dots\}$

93. 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

94. In an FA. When there is no path starting from initial state and ending in final state then that FA_____

- Accept null string
- Accept all strings
- Accept all non-empty strings
- **Does not accept any string**

95. According to theory of automata there are ____ types of languages.

- One
- **Two**
- Three
- Four

96. In Moore machine. If the length of input is 9, then the length of output string will be:

- 7
- 8
- 9

➤ 10

97. When ODD language is expressed by an FA, then it will have minimum _____ states.

➤ One

➤ Two

➤ Three

➤ Four

98. $[(a + b)(a + b)]^*$, given RE cannot generate the string _____.

➤ abbaabab

➤ abbbaa

➤ **bbbbbb**

➤ abbbaaaaa

99. 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

100. Every _____ is a _____ as well, but the converse may not be true.

➤ TG, FA

➤ **FA, TG**

➤ TG, GTG

➤ FA, GTG

101. 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?

➤ Moore machine

➤ **Mealy machine**

➤ Finite state machine

➤ Deterministic finite state machine

102. The recursive method for defining a language has ____ steps.

➤ One

➤ Two

➤ **Three**

➤ Four

103. Consider the following RE:

$a(a + b)b^*$

All of the following words are accepted except ____.

➤ aab

➤ abb

➤ aa

➤ **aba**

104. Which of the following regular expressions represent same language?

1. $(a+ab)^*$

2. $(ba+a)^*$

3. $a^*(aa^*b)^*$

4. $(a^*b^*)^*$

➤ **1 and 2**

➤ 1 and 3

➤ 3 and 4

➤ 1 and 4

105. For every three regular expressions R, S, T, the languages denoted by

$R(S \cup T)$ and $(RS) \cup (RT)$ are the ____.

➤ **Same**

➤ Different

➤ $R(S \cup T)$ is greater

➤ None of the given options

106. Alphabet $S = \{a, bc, cc\}$ has _____ number of letters.

➤ One

➤ Two

➤ **Three**

➤ Four

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

➤ RE

➤ GTG

➤ **NFA**

➤ None of the given options

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

➤ Accept null string

➤ **Accept same language**

➤ Accept different language

➤ None of the given options

109. 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

110. ----- can also help in proving Kleene Theorem |||.

➤ **NFA**

➤ PDA

➤ Moore machine

➤ Melay machine

111. Kleene's Theorem part II expresses the relationship between ____.

➤ FA and TG

➤ **TG and RE**

➤ RE and FA

➤ FA and RE

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

➤ **No transition at certain**

➤ One transition at certain state

➤ Two transitions at certain state

➤ More than two transitions at certain state

113. Let L be the language of all strings, defined over $\Sigma = \{0,1\}$, ending in

10. Which of the following strings are distinguishable with respect to L with z being 0?

➤ **111, 101**

➤ 001, 101

➤ 111, 111

➤ 010, 101

114. FA is also called

➤ TG

➤ GTG

➤ NFA

➤ **DFA**

115. If two RE's generate same language then these RE's are called ____.

➤ Same RE

➤ Equal RE

➤ Similar RE

➤ **Equivalent RE**

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

➤ Even even

➤ Odd

➤ **Palindromes**

➤ Integers

117. Kleene's Theorem part ||| expresses the relationship between ____.

➤ FA and TG

➤ TG and RE

➤ **RE and FA**

➤ FA and RE

118. 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 or FA2**

➤ FA1 and FA2

119. Every FA should be_____.

➤ **Deterministic**

➤ Non-deterministic

➤ Deterministic and non-deterministic

➤ Not depends on language

120. 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

121. If $\Sigma = \{ab, bb\}$, then Σ^* will not contain

➤ abbbab

➤ **bbba**

➤ bbbbab

➤ ababbb

122. Choose the correct word produced by RE $(a + b)^* ab$

➤ abb

➤ **abab**

➤ bbbb

➤ aaaa

123. 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**

124. "One language can be expressed by _____ GTG".

➤ Only one

➤ Only two

➤ Only three

➤ **More than one**

125. 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

➤ -

➤ +

➤ *

➤ ()

126. 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

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

➤ TG

➤ RE

➤ **NFA with null string**

➤ RE

128. 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.

129. Two machine are said to be equivalent if they print the _____ output string when same input string is run no them.

- **Same**
- Different
- Inverse
- Null

130. 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

131. A is not a valid transition in _____

- TG

➤ GTG

➤ **NFA**

➤ RE

132. Dead states are also called ____

➤ John Davey Lockers

➤ **Davey John Lockers**

➤ Mutex Lockers

➤ Semaphores

133. Language of all strings whose length is odd and number of y's even

defined over alphabet set $\Sigma = \{x, y\}$. ____ will be accepted by the given language.

➤ xxyxyxyyyx

➤ **xxyxyxyyyxy**

➤ xxyxyxyyyxx

➤ xxyxyxyyy

134. If an effectively solvable problem has answer in Yes or NO. then the solution is called ____

➤ Infinite problem

➤ **Decision procedure**

➤ Finite solution

- Optimal procedure

135. 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

136. 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

137. The strings or words which do not belong to a language are called _____ of that language

- Intersection

- Union

- **Complement**

- Quotient

138. Prime is a _____ language.

- Finite
- Both context free and regular
- Regular
- **Non-regular**

139. Finite Automaton (FA) must have _____ number of states while a language has ____ words.

- Infinite, finite
- Finite, finite
- **Finite, infinite**
- Infinite, infinite

140. The language “PRIME” is an example of _____ language.

- Regular but finite
- Regular
- Non regular but finite
- **Non regular**

141. 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

142. If a language is regular it must generate _____ number of distinct classes.

- **Finite**
- Infinite
- Two
- three

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

- **Terminals**
- Non-terminals
- Productions
- Intermediates

144. Set of all palindromes over {a,b} is:

- Regular
- Regular and finite
- Regular and infinite
- **Non-regular**

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

- Even-even
- Containing double a
- Start and end with same letter

➤ **Palindrome**

146. The language of all strings partition Σ^* into _____ class(es).

➤ **One**

➤ Two

➤ Three

➤ Four

147. The language of all strings not beginning with 'b' partitions Σ^* into _____ distinct classes.

➤ Two

➤ **Three**

➤ Four

➤ Five

148. The values of input (say a & b) do not remain same in one cycle due to

➤ NAND gate

➤ **Clock pulse**

➤ OR gate

➤ NOT gate

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

➤ Small letters

➤ Numbers

➤ **Capital letters**

➤ Small letters and numbers

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

➤ Transitions are based on input letter

➤ Transitions are based on specified substring

➤ **Transitions are based on regular expression**

➤ None of the given options

151. $a^* + b^* = (a + b)^*$ this expression is _____

➤ True

➤ **False**

152. Length of EVEN-EVEN language is _____

➤ **Even**

➤ Odd

➤ Sometimes even & sometimes odd

➤ Such language doesn't exist

153. 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**

154. If $S = \{aa, bb\}$, then S^* will not contain

➤ aabbaa

➤ bbaabbbb

➤ **aaabbb**

➤ aabbbb

155. Regular language are closed under the following operations.

➤ Union only

➤ Concatenation, Closure only

➤ **Union, concatenation and closure**

➤ Regular languages are not closed under any operation

156. $[(a + b)(a + b)]^*$, given RE cannot generate the string____

➤ abbaabab

➤ abbbbaa

➤ bbbbbbb

➤ **abbbaaaaa**

157. 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 state with final state
- Replace the old final state with new start state

158. The states in which there is no way to leave after entry are called

- **Davey john lockers**
- Dead states
- Waste baskets
- All of the given options

159. Every TG is an FA

- True
- **False**

160. Which of following string(s) belongs to the language of the regular

expression $(aa^*b)^*?$

- baabab
- abbbbaa
- aaaaaa
- **aabaab**

161. If $S = \{ab, bb\}$, then S^* will not contain

- abbbab
- **bbba**

➤ bbbbab

➤ ababbb

162. Given S, Kleene star closure is denoted by

➤ S^*

➤ S^+

➤ S^-

➤ None of these

163. Which of the following steps replaces multiple incoming transition edges with a single one in proving Kleene's theorem part II?

➤ 1

➤ 2

➤ 3

➤ 4

164. Let FA1 accepts many strings and FA2 accepts no string, then

FA1+FA2 will be equal to:

➤ FA1

➤ FA2

➤ FA2+FA1

➤ $(FA2)^*$

165. If $r_1 = (aa + bb)$ and $r_2 = (a + b)$ then the language $(aa + bb)(a + b)$ will be generated by _____

➤ **$(r_1)(r_2)$**

➤ $(r_1 + r_2)$

➤ $(r_2)(r_1)$

➤ $(r_1)^*$

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

➤ **EVEN-EVEN**

➤ ODD-ODD

➤ PALINDROME

➤ FACTORIAL

167. If L_1' and L_2' are regular languages. Then L_1, L_2 will be

➤ **Regular**

➤ Non regular

➤ May be regular

➤ None of the mentioned

168. If we have a finite language and the number of states in the FA is n then the maximum numbers of letters in the each word of the language that will be accepted by the given FA will be:

- 1
- **n-1**
- n+1
- n

169. Which of the following state is introduced while developing NFA for the closure of an FA?

- Simply an initial state
- Final state
- **An initial state which should be final as well**
- An initial state with loop for all letters

170. If FA1 corresponding to $(a+b)^*$ then FA1 must accept _____ string/strings

- No
- Odd length
- Even length
- **Every**

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

- **Drawing an arrow head before that state**
- Drawing a circle in that state
- Drawing '+' sign in that state

- Leaving state empty

172. The length of string “AbBAbcd” defined over $\Sigma = \{A,b,B,c,d\}$ is

- Three
- Four
- **Five**
- Six

173. 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

174. NFA with null string has ----- initial state(s)

- **One**
- Two
- Three
- Many

175. String x,y,z belongs to Σ^* such that $xz \in L$ but $yz \notin L$ where $L \subseteq \Sigma^*$ are:

- **Distinguishable**
- Indistinguishable

- Both distinguishable and indistinguishable
- Undetermined

176. In which of the following machine, the length of output string is the same to that of input string?

- Moore machine
- Finite automaton with output
- **Mealy machine**
- Non-deterministic finite automaton

177. There ____ a language for which only FA can be built but not the RE.

- Is
- **Cannot be**
- May be
- May not be

178. Reverse of string “YxwzYz” defined over $\Sigma = \{w, x, Y, z\}$ is

- zYzxyw
- zYwzxY
- zYzwyx
- **zYzwxY**

179. 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?

- Moore machine
- **Mealy machine (rep)**
- Finite state machine
- Deterministic finite state machine

180. While finding RE corresponding to TG, If TG has more than one start state then

- **Introduce the new start state (rep)**
- Eliminate the old start state
- Replace the old start stat with final state
- Replace the old final state with new start state

181. For every three regular expressions R, S, T, the languages denoted by $R(S \cup T)$ and $(RS) \cup (RT)$ are the ____.

- **Same (rep)**
- Different
- $R(S \cup T)$ is greater
- None of the given options

182. 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?

➤ **1 (rep)**

➤ 2

➤ 3

➤ 4

183. Every FA should be_____.

➤ **Deterministic (rep)**

➤ Non-deterministic

➤ Deterministic and non-deterministic

➤ Not depends on language

184. The difference between number of states with regular expression $(a + b)$ and $(a + b)^*$ is:

➤ **0**

➤ 1

➤ 2

➤ 3

185. If $S = \{x\}$, then S^* will be _____.

➤ $\{\epsilon, x, xxx, xxxx, xxxxxx, \dots\}$

➤ $\{\wedge, x, xx, xxx, xxxx, \dots\}$ (rep)

➤ $\{\wedge, x, xxx, xxxxx, xxxxxxx, \dots\}$

➤ $\{\wedge, xx, xxxx, xxxxxx, xxxxxxxx, \dots\}$

186. The recursive method for defining a language has ____ steps.

➤ One

➤ Two

➤ **Three (rep)**

➤ Four

187. 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 (rep)**

188. Given S, Kleene star closure is denoted by

➤ **S***

➤ S**

➤ S+

➤ S-

189. Kleene's Theorem part ||| expresses the relationship between ____.

- FA and TG
- TG and RE
- **RE and FA (rep)**
- FA and RE

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

- Initial and final states of FA1 and FA2 respectively
- **Initial states of both FAs (rep)**
- Initial state of FA1 only
- Final and initial states of FA1 and FA2 respectively

191. If $S = \{a,b\}$ then which of the following RE will generate all possible strings?

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

192. Choose the correct word produced by RE $(a + b)^* (aa+bb)$.

- abab
- babab
- **aaaa**

- ab

193. 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
- Only one
- Only three
- **Multiple**

194. Keeping in view the discussion by martin, how many states are required to recognize the language of all strings defined over $\Sigma = \{a,b\}$, with 'a' being the third letter from right?

- 13
- 14
- **15**
- 16

195. Consider FA1 and FA2 are two finite automata representing two different languages. Now FA3 which is the sum of FA1 and FA2 will accept all strings accepted by:

- **FA1 and FA2**
- FA1 or FA2
- FA1 but not FA2

- FA2 but not FA1

196. A transition graph is converted into a(n) _____ in order to obtain regular expression.

- FA
- GTG
- **NFA**
- NFA- $\wedge$

197. 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 (rep)**
- Multiplication of language with itself
- Addition of a language with itself

198. There _____ be dead state in NFA.

- May not
- Must
- Should not
- **Will**

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

- Mealy machine
- **Moore machine**
- Finite automaton with output
- Non-deterministic finite automaton

200. Consider the languages $L_1 =$ and $L_2 = \{a\}$. Which one of the following represents $L_1 L_2^* \cup L_1^*$

- $\wedge$
- **a^***
- All of the mentioned
- None of the mentioned

201. The length of string “AbBAbcd” defined over $\Sigma = \{A,b,B,c,d\}$ is

- Three
- Four
- **Five (rep)**
- Six

202. 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 (rep)**

203. 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**

204. 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 Initial and final states in FA1 and FA2 respectively

➤ No final and initial states in FA1 and FA2 respectively

➤ **No initial state in FA1 only**

➤ No final state in FA2 only

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

➤ FA1 only

➤ **FA2 only**

➤ FA1 or FA2

➤ FA1 and FA2

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

➤ **Concatenation (rep)**

- Iteration
- Selection
- Addition

207. Statement if Σ is finite then Σ^* is finite is _____

- True
- **False**
- Σ and Σ^* has no relationship
- None of the above

208. 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.

- Union
- Sum
- **Concatenation**
- Intersection

209. 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

210. An FA is a collection of:

- **Finite states, finite transition and finite input letters (rep)**
- Infinite states, infinite transition and infinite input letters
- Only finite states and finite transitions
- Only infinite states and infinite transitions

211. If $\Sigma = \{ab, bb\}$, then Σ^* will not contain

- abbbab
- **bbba (rep)**
- bbbbab
- ababbb

212. In _____ there must be transition for all the letters of a string.

- NFA
- GTG
- TG
- **FA (rep)**

213. Choose the correct word produced by RE $(a + b)^* ab$

- abb
- **abab (rep)**
- bbbb

- aaaa

214. Length of EVEN-EVEN language is _____

- **Even (rep)**

- Odd
- Sometimes even & sometimes odd
- Such language doesn't exist

215. 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 (rep)**
- Multiplication of language with itself
- Addition of a language with itself

216. Kleene's theorem states that

- **All representations of a regular language are equivalent**
- All representations of a context free language are equivalent
- All representations of a recursive language are equivalent
- Finite automata are less powerful than pushdown automata

217. 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

218. Which of the following state is introduced while developing NFA for the closure of an FA?

- Simply an initial state
- Final state
- **An initial state which should be final as well (rep)**
- An initial state with loop for all letters

219. 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?

- **Final states in both FAs (rep)**
- Initial states in both FAs
- FA2 having initial state only
- FA2 having final state only

220. Consider the following RE:

$a(a + b)b^*$

All of the following words are accepted except _____.

- aab
- abb

➤ aa

➤ **aba (rep)**

221. 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**

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

➤ RE

➤ GTG

➤ **NFA (rep)**

➤ None of the given options

223. Statement 1: string is accept in Moore Machine.

Statement 2: there are more than 5-Tuples in the definition of Moore Machine.

Choose the correct option:

➤ Statement 1 is true and Statement 2 is true

➤ **Statement 1 is true while Statement 2 is false**

- Statement 1 is false while Statement 2 is true
- Statement 1 and Statement 2. Both are false

224. If two RE's generate same language then these RE's are called ____.

- Same RE
- Equal RE
- Similar RE
- **Equivalent RE (rep)**

225. If we have more than one accepting states or an accepting state with an outdegree. Which of the following actions will be taken?

- **Addition of new state**
- Removal of a state
- Make the newly added state as final
- More than one option is correct

226. Which of the following string is a part of EQUAL language?

- aabbba
- babab
- **ababab**
- aabbbaa

227. Moore machine is an application of:

- Finite automata without input

- **Finite automata with output**
- Non-finite automata with output
- None of the mentioned

228. Which of the following word is not accepted by the regular expressions $(a + b)^*(aa)(a+b)^*$?

- aaaa
- baaa
- aa
- **bab**

229. Keeping in view the language of all strings ending with 'a', for which symbol we will take a loop on the final state of its transition diagram?

- **a**
- b
- c
- d

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

- Same, different
- Different, same
- Unique, different

➤ **Same, same**

231. In NFA, if null word (λ) is allowed to be a label of an edge, then that NFA is called

- NFA with one string
- NFA with two strings
- NFA without null string

➤ **NFA with null string**

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

➤ **EVEN-EVEN (rep)**

- ODD-ODD
- PALINDROME
- FACTORIAL

233. FA stands for _____

➤ **Finite automation**

- Fixed automation
- False automation
- Functional Automation

234. When ODD language is expressed by an FA, then it will have minimum _____ states.

➤ **One (rep)**

➤ Two

➤ Three

➤ Four

235. Which of the following doesn't accept any language?

➤ Finite state machine

➤ Deterministic finite state machine

➤ Regular expression

➤ **Moore machine**

236. How many states of a finite automation will be final for accepting the only string 'abb'?

➤ **1**

➤ 2

➤ 3

➤ 4

237. Null strings can be specified on edges in:

➤ Finite Automata

➤ Non-deterministic finite automata

➤ **Transition graph**

➤ Melay machine

238. Which of the following is an utility of state elimination phenomenon?

- DFA to NFA
- NFA to DFA
- **DFA to Regular Expression**
- All of the mentioned

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

- Must
- **May not**
- Should not
- Will

240. FA is also called

- TG
- GTG
- NFA
- **DFA (rep)**

241. In case of finite automation there, _____ be a transition on each _____ for every letter of the alphabet set.

- **Must, state**
- May be, state

➤ Often, edge

➤ Must, edge

Ans Mughal