TOC Unit 2 RE MCQ QB - bdb

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TOC

Unit II Regular Expression

Question Bank

1. The string 1101 does not belong the set represented by

A. 110*(0+1) B. 1(0+1)*101

C. (10)*(01)*(00+11)* D. (00+(11)*0)* Answer: C & D

Explanation:- R.E of option C won't generate 1101 as you can see the language will contain L(C) = {epsilon,10,1010,1001,0101,00,11,0011,1100,……..}

Also, R.E of option D has '1' but here two '11' are together hence it's impossible to generate 1101. L(D) = {Epsilon,0,00,110,11110,11000,…….}

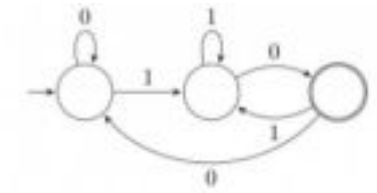
Here Option (C) and (D) both are correct.

2. The number of states in the minimal deterministic finite automaton corresponding to the regular expression (0 + 1) * (10) is .

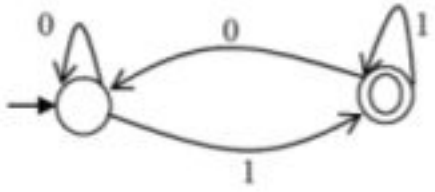
A. 1
B. 2
C. 3
D. 4

Answer: C

Explanation:-



3. Which of the regular expressions given below represent the following DFA? I) 0*1(1+00*1)* II) 0*1*1+11*0*1 III) (0+1)*1



A. I and II only
B. I and III only
C. II and III only
D. All of these

Answer: B

Explanation:- (I) and (III) represent DFA. (II) doesn't represent as the DFA accepts strings like 11011, but the regular expression doesn't accept.

4. Which one of the following languages over the alphabet {0,1} is described by the

regular expression: (0+1)*0(0+1)*0(0+1)*?

A. The set of all strings containing the substring 00.
B. The set of all strings containing at most two 0's.
C. The set of all strings containing at least two 0's.
D. The set of all strings that begin and end with either 0 or 1.
Answer: C

Explanation:- The regular expression has two 0′s surrounded by (0+1)* which means accepted strings must have at least 2 0′s.

5. Language accepted by the given RE is explained as a*b +b*a

A. Any number of a's are followed by ba or Any number of b's are followed by ab B. Any number of a's are followed by b or Any number of b's are followed by a C. Any number of aa's are followed by b or Any number of ba's are followed by a D. Any number of aba's are followed by b or Any number of b's are followed by a Answer: B

Explanation:- Language accepted by the given RE is explained as a*b +b*a is Any number of a's are followed by b or Any number of b's are followed by a

6. Which of the following is Applications of FA and RE
A. grep command
B. Text editors
C. Lexical Analyzer
D. All of the above
Answer: D

Explanation:- Applications of FA and RE include grep command, text editors and Lexical Analyzer

7. Set of strings consisting of even number of a's followed by odd number of b's , so L = {b, aab, aabbb, aabbbbb, aaaab, aaaabbb, ……..} Find RE

A. (aaa)*(b)*b
B. (a)*(bbb)*b
C. (a)*(b)*b
D. (aa)*(bb)*b
Answer: D

Explanation:- Set of strings consisting of even number of a's is given as (aa)* followed by odd number of b's i.e. (bb)* b

8. Regular expressions are closed under

A. Union
B. Intersection
C. Kleen star
D. All of the mentioned
Answer: D

Explanation:- According to definition of regular expression , The set of regular languages is closed under intersection. and that regular languages are closed under union and

complementation

9. How many strings of length less than 4 contains the language described by the regular expression (x+y)*y(a+ab)*?

A. 7
B. 10
C. 12
D. 11
Answer: C
Explanation:- Length 0 = 0 (null string not allowed) Length =1 {y}=1

Length=2 = {xy , yy, ya} =3

Length= 3 = { *xxy*,*xyy*,*yxy*,*yyy*,*yab*,*yaa*,*xya*,*yya*} Total = 12

10. Regular expression for all the strings starts with ab and ends with ba is A. aba*b*ba
B. ab(ab)*ba
C. ab(a+b)*ba
D. All of above
Answer: C
Explanation:- Starts with ab then any number of a or b and ends with ba.

11. A language is regular if and only if
A. accepted by DFA
B. accepted by PDA
C. accepted by LBA
D. accepted by Turing machine
Answer:A
Explanation: All of above machine can accept regular language but all string accepted by machine is regular only for DFA.

12. Which of the following identity is wrong?
A. R + R = R
B. (R*)* = R*
C. R = R = R ε ε
D. ØR = RØ = RR*
Answer: D
Explanation: ØR = RØ but not equal to RR*

13. Let the class of language accepted by finite state machine be L1 and the class of languages represented by regular expressions be L2 then
A. L1<L2
B. L1>=L2
C. L1 U L2 = .*
D. L1=L2
Answer: D
Explanation: Finite state machine and regular expression have same power to express a language.

14. Regular expression (x/y)(x/y) denotes the set
A.{xy,xy}
B. {xx,xy,yx,yy}
C. {x,y}
D. {x,y,xy}
Answer: B
Explanation: Possible strings constructed from given RE is {xx,xy,yx,yy}

15. The regular expression denote a language comprising all possible strings of even length over the alphabet (0, 1)
A. 1 + 0(1+0)*
B. (0+1) (1+0)*
C. (1+0)
D. (00+0111+10)*
Answer: D
Explanation: D generates all strings with even length.

16. Regular expressions are used to represent which language
A. Recursive language
B. Context free language
C. Regular language
D. All of these
Answer: C
Explanation: Regular languages are denoted with Regular expression

17. Which of the following identity is true?
A. +RR* = R* = + R*R ε ε
B. (R1R2)*R1 = R1(R2R1)*
C. R*R* = R*
D. All of these
Answer: D
Explanation: All are correct rules of regular expression.

18.If P, Q, R are three regular expressions and if P does not contain a then the equation R = R + RP has a unique solution given by
A. R = QP*
B. R = P*Q
C. R = RP
D. None of these
Answer: A
Explanation: Let P and Q be two regular expressions.
If P does not contain null string(Є), then R = Q + RP has a unique solution that is
R = QP* Solution – R = Q + RP
= Q+ (QP*)P
= Q+ QP*P
= Q(Є+P*P)
= QP*
= R.H.S

Hence R=QP* is the solution of R=Q+RP

19. Which of the following statement is true?
A. Every language that is defined by regular expression can also be defined by finite automata
B. Every language defined by finite automaton can also be defined by regular expression C. We can convert regular expressions into finite automaton
D. All of these
Answer: D
Explanation: RE is the most effective way to represent any language. The languages accepted by some regular expression are referred to as Regular languages. A regular expression can also be described as a sequence of pattern that defines a string.

20.The set of all strings over ∑ ={a,b} in which a single a is followed by any number of b's a single b followed by any number of a's is
Answer:
Explanation:

21.Which of the following regular expression identity is true?
A. (r+s)*=r*
B. (r+s)*= r*+s*
C. (r*s*)*=(r+s)*
D. r* s*= r *+s*
Answer:C
Explanation: L(LHS)= {Є, r, s ,rr ,ss ,rs ,rrs ,rrss rss, ….. }
L(RHS)= {Є ,r, s, rr , ss ,rs , rrs , rrss, rss,,,}
L(LHS =L(RHS)

22. Given the language L = {ab, aa, baa}, which of the following strings are in L*? **A** abaabaaabaa
B. aaaabaaaa
C. baaaaabaa
D. All of these
Answer:D
Explanation: All above strings can be constructed from given language
abaabaaabaa = ab aa baa ab aa
aaaabaaaa = aa aa baa aa
baaaaabaa = baa aa ab aa

23. In some programming languages, an identifier is permitted to be a letter followed by any number of letters or digits. If L and D denotes the set of letters and digit respectively. Which of the following expression defines an identifier?
A. (L + D) *
B. (L.D) *
C. L(L + D) *
D. L(L.D) *
Answer: C
Explanation: LETTER. (LETTER + DIGIT)* is the regular expression for it.

24. If r and s are two regular expression then expression r+s is:
A. Regular expression
B. Regular language
C. Union
D. None of these
Answer: A
Explanation: r + s is a regular expression if r and s are regular expressions
25. While applying Pumping lemma over a language, we consider a string x that belong to L and fragment it into _____ parts.
A.2
B.5
C.3
D.6
Answer: C
Explanation: Pumping Lemma for Regular Languages
For any regular language L, there exists an integer n, such that for all x L with |x| ≥ n, there ∈ exists u, v, w Σ , such that x = uvw, and ∈ ∗
(1) |uv| ≤ n
(2) |v| ≥ 1
(3) for all i ≥ 0: $uv^i w$ L ∈

26.Regular expression for even length string:
A. (0|1)(0|1)*
B. (0|1)*
C. (0|1)(0|1)(0|1)*
D. (00|11|10|01)*
Answer: D
Explanation: (00|11|10|01)* is correct generating even length strings
{00,01,10,11,0000.0001.0010,0011,….}

27. Regular expression for all strings starts with ab and ends with bba is.
A. aba*b*bba
B. ab(a+b)*bba
C. ab(ab)*bba
D. All of the mentioned
Answer: B
Explanation: ab(a+b)*bba is RE for all strings starts with ab and ends with bba

28. Regular expression for all binary string with at least 3 characters and 3rd character should be zero
A. (0|1) (0|1)0(0|1)
B. (0|1) (0|1)0(0|1)*
C. (0|1)* (0|1)(0|1)0
D. (0|1) (0|1)0*
Answer: B
Explanation: (0|1) (0|1)0(0|1)* generates strings = {000,010,110,100,….}

29. What is the language generated by this regular expression? a(a+b)*a
A. Always starts with b
B. Can have any number of ba and ab
C. Cannot have 2 b's together.
D. Starts and end with same symbol
Answer: D
Explanation: a(a+b)*a Starts and end with same symbol
30. Which of the following conversion is not feasible?

A. Regular expression to automaton conversion
B. Automaton to Regular Expression Conversion
C. NFA to DFA
D. None of the mentioned
Answer: D
Explanation: All conversions are possible

31. Which of the technique can be used to prove that a language is non regular? A. Pumping Lemma
B. Arden’s theorem
C. Ogden’s Lemma
D. Thompson's rule
Answer: A
Explanation: Pumping Lemma is used to prove regularity of language

32. If we select a string w such that x L, and x= x=uvw. Which of the following portions cannot be ∈ an empty string?
A. u
B. v
C. w
D. all of the mentioned
Answer: B
Explanation: in uvw , v can not be empty

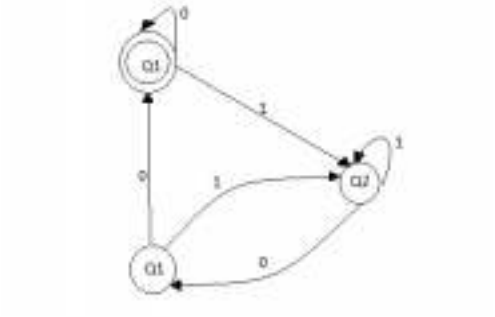
33. There exists a language L. We define a string w such that x L and x=uvw and |x| >=n for some ∈ constant integer n. What can be the maximum length of the substring uv i.e. |uv|<=? A. n
B. |v|
C. |u|
D. none of the mentioned
Answer: A
Explanation: Pumping Lemma for Regular Languages
For any regular language L, there exists an integer n, such that for all x L with |x| ≥ n, there exists ∈ u, v, w Σ , such that x = uvw, and ∈ ∗
(1) |uv| ≤ n
(2) |v| ≥ 1
(3) for all i ≥ 0: $uv^{i}w$ L ∈

34. Which of the following are not regular ?

A. String of 0’s whose length is a perfect square
B. Set of all palindromes made up of 0’s and 1's
C. Strings of 0’s, whose length is a prime number
D. All of these
Answer: D
Explanation: All are not regular

35. Regular expression corresponding to the state diagram given in the figure is

00)* D. (1 + 0(1 + 00) 11)*
Answer: A



A. (0+1(1 + 01)* 00)* B. (1 + 0 (0 + 10) 00)* C. (0 + 1 (1 + 10)

Explanation: (0+1(1 + 01)* 00)* is RE for given figure.

36. Regular expression a / b denotes the set
A. {a}
B. { epsilon, a, b}
C. {a,b}
D. {ab}
Answer: C
Explanation: L(a/b)= {a,b}

37. Which of the following regular expressions denotes zero or more instances of an a or b ? A. a | b
B. (ab)*
C. (a | b)*
D. a* | b
Answer: C
Explanation: L((a | b)*)={epsilon, a,b,aa,bb,ab,ba,bbb,….}

38. Let w= xyz and y refers to the middle portion and |y|>0.What do we call the process of repeating y 0 or more times before checking that they still belong to the language L or not? A. Generating
B. Pumping
C. Producing
D. None of the mentioned
Answer: B
Explanation: The process of repetition is called pumping and so, pumping is the process we perform before we check whether the pumped string belongs to L or not.

39. Fill in the blank in terms of p, where p is the maximum string length in L.
Statement: Finite languages trivially satisfy the pumping lemma by having n = _____ A. p*1
B. p+1
C. p-1
D. None of the mentioned
Answer: B
Explanation: Finite languages trivially satisfy the pumping lemma by having n equal to the maximum string length in l plus 1.

40. Answer in accordance to the third and last statement in pumping lemma: For all _____ xy^iz L∈
A. i>0
B. i<0
C. i<=0
D. i>=0
Answer: D
Explanation : Suppose L is a regular language . Then there is an integer n so that for any x L and |x| ∈ >=n, there are strings u,v,w so that
x= uvw
|uv|<=n
|v|>0 for any m>=0, uv^mw L. ∈

41.Arden's theorem is true for:
A. More than one initial states
B. Null transitions
C. Non-null transitions
D. None of the mentioned
Answer: C
Explanation: Arden's theorem strictly assumes the following;
a) No null transitions in the transition diagrams
b) True for only single initial state

42. In order to represent a regular expression, the first step to create the transition diagram is: A. Create the NFA using Null moves
B. Null moves are not acceptable, thus should not be used
C. Predict the number of states to be used in order to construct the Regular expression D. None of the mentioned
Answer: A
Explanation: Two steps are to be followed while converting a regular expression into a transition diagram:
a) Construct the NFA using null moves.
b) Remove the null transitions and convert it into its equivalent DFA.

43. (0+ε) (1+ε) represents
A. {0, 1, 01, ε}

B. {0, 1, ε}
C. {0, 1, 01 ,11, 00, 10, ε}
D. {0, 1}
Answer: A
Explanation: The regular expression is fragmented and the set of the strings eligible is formed. '+' represents union while '.' Represents concatenation. {0, 1, 01, ε}

44. Regular Expression denote precisely the _____ of Regular Language. A. Class
B. Power Set
C. Super Set
D. None of the mentioned
Answer: A
Explanation: Regular Expression denote precisely the class of regular language. Given any regular expression, L(R) is a regular language. Given any regular language L, there is a regular expression R, such that L(R)=L.

45. Precedence of regular expression in decreasing order is
A. * , . , +
B. . , * , +
C. . , + , *
D. + , a , *
Answer: A
Explanation: * , . , + is correct order

46. (a+b)* is equivalent to
A. b*a*
B. (a*b*)*
C. a*b*
D. none of the mentioned
Answer: B
Explanation: (a+b)* = (a*b*)*

47. A language is regular if and only if
A. accepted by DFA
B. accepted by PDA
C. accepted by LBA
D. accepted by Turing machine
Answer: A
Explanation: All of above machine can accept regular language but all string accepted by machine is regular only for DFA.

48. What kind of expressions do we used for pattern matching?
A. Regular Expression
B. Rational Expression
C. Regular & Rational Expression
D. None of the mentioned
Answer: C
Explanation: In automata theory, Regular Expression(sometimes also called the

Rational Expression) is a sequence or set of characters that define a search pattern, mainly for the use in pattern matching with strings or string matching.

49. RR* can be expressed in which of the forms:
A. R+
B. R
C. R+ U R
D. R
Answer: A
Explanation: RR*=R+ as R+ means the occurrence to be at least once.
50. Concatenation Operation refers to which of the following set operations: A. Union
B. Dot
C. Kleene
D. Two of the options are correct
Answer: B
Explanation: Two operands are said to be performing Concatenation operation AB = A•B = {xy: x ∈ ∈ A & y B}.