The Bodwad Sarvjanik Co-Op.Education Socity Ltd.,Bodwad
Arts commerce and Science College Bodwad

Question Bank

Class: - T Y Bsc Computer Sem :- VI
Subject: - Theoretical Computer Science Paper Name:- UG-CS-604

- **Multiple Choice Question**

1) 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

2) Regular grammar is
a) context free grammar
b) non context free grammar
c) english grammar
d) none of the mentioned

3) Which of the following is not a regular expression?
a) [(a+b)*-(aa+bb)]*
b) [(0+1)-(0b+a1)*(a+b)]*
c) (01+11+10)*
d) (1+2+0)*(1+2)*

4) Regular expressions are closed under
a) Union
b) Intersection
c) Kleen star
d) All of the mentioned

5) Answer in accordance to the third and last statement in pumping lemma:
For all _____ $xy^iz \in L$
a) i>0
b) i<0
c) i<=0
d) i>=0

6) Which among the following are incorrect regular identities?
a) εR=R
b) ε*=ε
c) Φ*=**ε**
d) RΦ=R

7) Arden's theorem is true for:
a) More than one initial states
b) Null transitions
c) Non-null transitions
d) None of the mentioned

8) Regular Expression denote precisely the _____ of Regular Language.
a) Class
b) Power Set
c) Super Set
d) None of the mentioned

9) While applying Pumping lemma over a language, we consider a string w that belong to L and fragment it into _____ parts.
a) 2
b) 5
c) 3
d) 6

10) Pumping lemma is used to proving
a)A given grammer is regular
b) A given language is regular
c) A given language is not regular
d) All of these above

11) A regular language over an alphabet ∑ is one that cannot be obtained from the basic languages using the operation
a) Union
b) Concatenation
c) Kleene*****
d) All of the mentioned

12) A tree with 10 vertices has
a) 10 edges
b) **b) 9 edges**
c) c) 8 edges
d) d) 5 edges

13) (AUB)∩(B∩B) is
a) A
b) A∩B
c) B
d) none of these

14) An equivalence relation is a relation which is

a) Reflexive and symmetric
b) Symmetric and transitive
b) Reflexive Symmetric and transitive
d)None of these

15) The number of element in the power set P(S) of the set S ={{∅},1,{2,3}}
a) 5
b) 6
c) 8
d) 4

16) If relation R over{a,b,c} is given by R={(a,a) ,(b,b),(a,b),(b,a),(c,c)},
Then which of the property does R have
a) Symmetry
b) reflexive
c) Transitive
d) All of these

17) Which of the following are the null set
a) {0}
b) {∅}
c) {}
d) ∅

18) The number of element in the power set P(S) of the set S with n element
_____
a) n
b) n^2
c) $\mathbf{2^n}$
d) $2n + 1$

19) If x= 01 , y=101 , z=011 then xyzy is
a) 01011011
b) 01101101011
c) 01011101101
d) 01101011101

20) Which of the following is true?
a) All NFA are DFA
b) All DFA are NFA
c) NFA and DFA have different power
d) both a) and b)

21) the language accepted by finite automata is
a) Context free
b) Regular
c) Non regular
d) None of these

22) The major difference between a Moore Machine and Mealy machine is_____

a) The output of Moore machine depends present state and input
b) The output of Moore machine depends present state
c) Both a) and b)
d) None of above

23) Statement 1: A Finite automata can be represented graphically; Statement 2: The nodes can be its states; Statement 3: The edges or arcs can be used for transitions
Hint: Nodes and Edges are for trees and forests too.
Which of the following make the correct combination?

a) Statement 1 is false but Statement 2 and 3 are correct
b) Statement 1 and 2 are correct while 3 is wrong
c) None of the mentioned statements are correct
d) All of the mentioned

24) Which of the following is a not a part of 5-tuple finite automata?

a) Input alphabet
b) Transition function
c) Initial State
d) Output Alphabet

25) In mealy machine, the O/P depends upon?
a) State
b) Previous State
c) State and Input
d) Only Input

26) Which of the given are correct?
a) Moore machine has 6-tuples
b) Mealy machine has 6-tuples
c) Both Mealy and Moore has 6-tuples
d) None of the mentioned

27) Which of the following does not belong to input alphabet if S={a, b}* for any language?
a) a
b) **b**
c) e
d) none of the mentioned

28) The number of tuples in an extended Non Deterministic Finite Automaton:
a) 5
b) 6
c) 7
d) 4

29) Which of the following is an application of Finite Automaton?
a) Compiler Design
b) Grammar Parsers
c) Text Search
d) All of the mentioned

30) Complement of regular sets are _____
a) Regular
b) CFG
c) CSG
d) RE

31) 1. Which of the following is correct?
Statement 1: ε represents a single string in the set.
Statement 2: Φ represents the language that consist of no string.
a) Statement 1 and 2 both are correct.
b) Statement 1 is false but 2 is correct.
c) Statement 1 and 2 both are false.
d) There is no difference between both the statements, ε and Φ are different notation for same reason.

32) Are ambiguous grammar context free?
a) Yes
b) No

33) The Grammar can be defined as: G=(V, ∑, p, S)
In the given definition, what does S represents?
a) Accepting State
b) Starting Variable
c) Sensitive Grammar
d) None of these

34) The entity which generate Language is termed as:
a) Automata
b) Tokens
c) Grammar
d) Data

35) A->aA| a| b
The number of steps to form aab:
a) 2
b) 3
c) 4
d) 5

36) The language accepted by Push down Automaton:
a) Recursive Language
b) Context free language
c) Linearly Bounded language
d) All of the mentioned

37) Which among the following is the root of the derivation tree?
a) Production P
b) Terminal T
c) Variable V
d) Starting Variable S

38) A grammar with more than one parse tree is called:
a) Unambiguous
b) Ambiguous
c) Regular
d) None of the mentioned

39) In turing machine how many cell can examine by the R/W head in each move
a) zero
b) one
c) two
d) one or more

40) .Which among the following is equivalent to the given regular expression?
01*+1
a) (01)*+1
b) 0((1)*+1)
c) (0(1)*)+1
d) ((0*1)1*)*

41) Regular Expression R and the language it describes can be represented as:
a) R, R(L)
b) L(R), R(L)
c) R, L(R)
d) All of the mentioned

42) The PDA has_____ tuples
a) 3
b) 5
c) 7
d) 8

43) The production of the form A->B , where A and B are non terminals is called
a) Null production
b) Unit production
c) Greibach Normal Form
d) Chomsky Normal Form

44) A push down automata can be represented as:
PDA= NFA +[stack] State true or false:
a) true
b) false

44) Which of the following correctly recognize the symbol '|-' in context to PDA?
a) Moves
b) transition function
c) or/not symbol
d) none of the mentioned

45) A push down automaton employs _____ data structure.
a) Queue
b) Linked List
c) Hash Table
d) Stack

46) Push down automata accepts _____ languages.
a) Type 3
b) Type 2
c) Type 1
d) Type 0

47) A string is accepted by a PDA when
a) Stack is empty
b) Acceptance state
c) Both (a) and (b)
d) None of the mentioned

48) The following move of a PDA is on the basis of:
a) Present state
b) Input Symbol
c) Both (a) and (b)
d) None of the mentioned

49) Which among the following is not a part of the Context free grammar tuple?
a) End symbol
b) Start symbol
c) Variable
d) Production

50) Which of the following automata takes stack as auxiliary storage?
a) Finite automata
b) Push down automata
c) Turing machine
d) All of the mentioned

51) NPDA stands for
a) Non-Deterministic Push Down Automata
b) Null-Push Down Automata
c) Nested Push Down Automata
d) All of the mentioned

52) The instantaneous PDA is has the following elements
a) State
b) input
c) Stack content
d) All of the mentioned

53) In PDA |-* is define as _____ closure
a) symmetric and reflexive
b) transitive and reflexive
c) symmetric and transitive
d) none of the mentioned

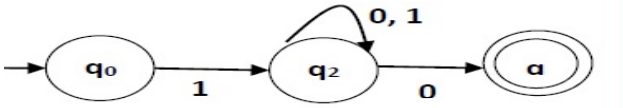
54) The following denotion belongs to which type of language:
G=(V, T, P, S)
a) Regular grammar
b) Context free grammar
c) Context Sensitive grammar
d) All of the mentioned

55) Given Grammar: S->A, A->aA, A->e, B->bA
Which among the following productions are Useless productions?
a) S->A
b) A->aA
c) A->e
d) B->bA

56) Turing Machine has _____ tuples.
a) 7
b) 5
c) 10
d) 6

57) To describe the Turing Machine using
a) Instantaneous describtion using move relation
b) Transition Table
c) Transition Graph
d) All of these

58) The regular expression accepted by follpwing FA is



a) **1(0+1)*0**
b) b) (1+0)
c) c) 110
d) d) 0+1*

59) Regular expression for all string starts with ab and end with bba is
a) aba*b*bba
b) aba(ab)*bba
c) ab(a+b)*bba
d) all of the mentioned

60) P,Q,R be regular expression over∑, P is not ∈, then R=Q+RP has a unique solution
a) Q*****P
b) QP*
C) Q*P*
d) (P*Q*)*

61) Context free language are closed under
a) Union
b) Intersection
c) Complementation
d) Set Difference

62) A countable union of countable sets is not
a) Countable
b) Uncountable
c) Countable infinite
d) Denumerable

63) Any given transition diagram has an equivalent
a) regular expression
b) NDFSM
c) DFSM
d) all of these

64)Can a DFA simulate NFA?
a) no
b) Yes
c) some time
d) depends on NFA

65) Given an arbitrary DFA with 2^N states, what will be the number of states of the corresponding NFA?
a) N x N
b) 2^N
c) 2N
d) N!

66) The entity which generate Language is termed as-----

A. Automata
B. Grammar
C. Tokens
D. Data

67) Production Rule: aAb->agb belongs to which of the following category?

A. Regular Language
B. Context free Language
C. Context Sensitive Language
D. Recursively Enumerable Language

68 The Grammar can be defined as: G=(V, ∑, p, S)
In the given definition, what does S represents**?**

A. Accepting State **B. Starting Variable**
C. Sensitive Grammar D. None of the above

69). Which of the following statement is false?

A. Context free language is the subset of context sensitive language
B. Regular language is the subset of context sensitive language
C. Recursively ennumerable language is the super set of regular language
D. Context sensitive language is a subset of context free language

70) ====Which of the following operation can be applied on regular expressions?

A. Union

B. Concatenation
C. Closure
D. All of the above

71) Regular expressions are used to represent which language?

A. Recursive language
B. Regular language
C. Context free language
D. All of the above.

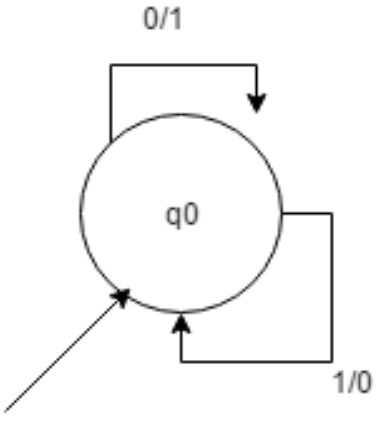
72) The set of all strings over ∑ = {0,1} in which all strings that beings and ends with 0 is--------

A. 0(0+1)0
B. 00
C. 00(0+1)0
D. 00(0+1)11

73) The set of all strings over ∑ = {a,b} in which all strings that starts with and ends with same letter is--------

A.[a(a+b)*b + b(a+b)*a**]**
B. [a(a+b)*a + b(a+b)*b]
C. a(a+b)*a
D. b(a+b)*b

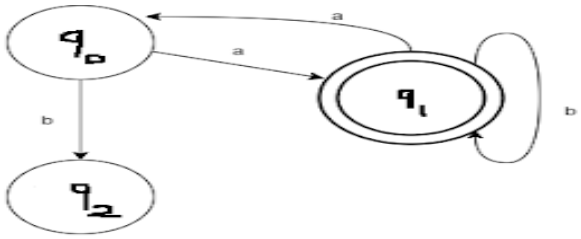
74). Which of the following does the given Mealy machine represents?



A. 1's Complement
B. 2's Complement
C. 10's Complement

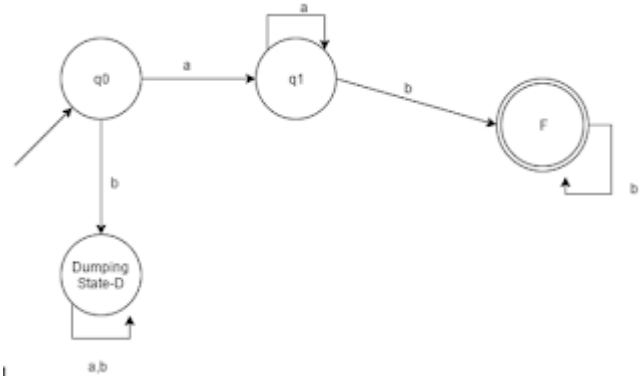
D. 9's Complement

75). Which of the following will not be accepted by the following DFA?



A. ababaabaa
B. abbbaa
C. abbbaabb
D. abbaabbaa

76). Which among the following is the missing transition in the given DFA?
L= {xϵ∑= {a, b} | x starts with a and ends with b}

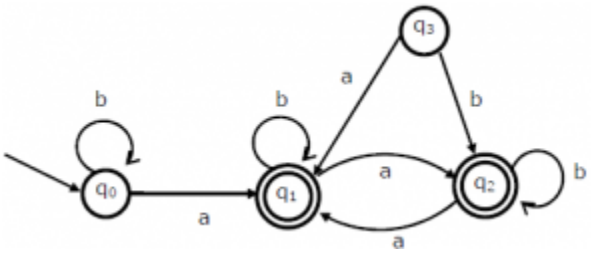


A. δ (q0, a) =q0
B. δ (F, a) =D
C. δ (F, a) =q1
D. δ (q1, a) =D

77). Reverse of a DFA can be formed by----

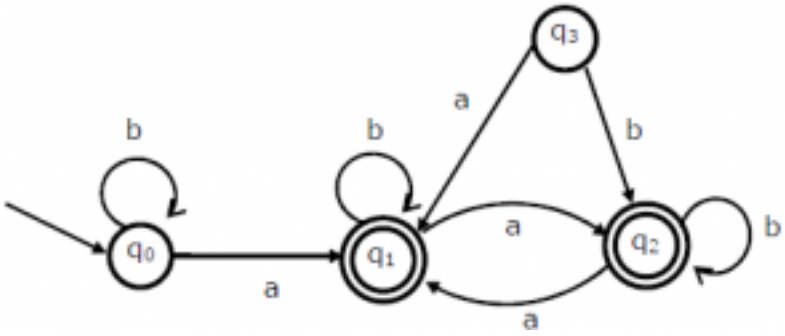
A. using PDA
B. making final state as non-final
C. making final as starting state and starting state as final state
D. None of the above.

78). The language accepted by this DFA is---



A. b*ab*ab*ab* B. (a+b)*
C. b*a(a+b)* D. b*ab*ab*

79) The minimum state automaton equivalent to the below FSA has the following number of states----



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

80)The set of all strings over the alphabet S = {a, b} (including e) is denoted by
A) (a + b)*
(B) (a + b)+
(C) a+b+
(D) a*b*

81)Which of the following regular expression identity is true?
(A) r(*) = r*
(B) (r*s*)* = (r + s)*
(C) (r + s)* = r* + s*
(D) r*s* = r* + s*

82)Consider a grammar :
G = ({ x , y) , { s , x , y } , p , s)
where elements of parse :
S--> x y
S -->y x
x--> x z
x--> x
y--> y
z--> z
The language L generated by G most accurately is called
(A) Chomsky type 0
(B) Chomsky type 1
(C) Chomsky type 2
(D) Chomsky type 3

83) What is the highest type number which can be applied to the following grammar**?**
S —> Aa, A —> Ba, B —> abc
(A) Type 0
(B) Type 1
(C) Type 2
(D) Type 3

84**) The following grammar**
G = (N, T, P, S)
N = {S, A, B}
T = {a, b, c}
P : S ? aSa
S ? aAa
A ? bB
B ? bB
B ? c is
(A) Is type 3
(**B) Is type 2 but not type 3**
(C) Is type 1 but not type 2
(D) Is type 0 but not type 1

85) If L_1 = {x | x is a palindrome in (0 + 1)*}
L_2 = {letter (letter + digit)* };
L_3 = (0n 1n 2n | n > 1}
L_4 = {ambnam+n | m, n > 1}
then which of the following statement is correct ?
(**A) L_1 is context free language and L_3 is context sensitive language**
(B) L_2 is a regular set and L_4 is not a context free language
(C) Both L_1 and L_2 are regular sets
(D) Both L_3 and L_4 are context-sensitive languages

86) The following grammar

G = (N, T, P, S)
N = {S, A, B, C, D, E}
T = {a, b, c}
P : S ? aAB
AB ? CD
CD ? CE
C ? aC
C ? b
bE ? bc is

(A) Is type 3
(B) Is type 2 but not type 3
(**C) Is type 1 but not type 2**
(D) Is type 0 but not type 1

87) If L1 and L2 are context free language and R a regular set, then which one of the languages below is not necessarily a context free language?

(A) $L_1 L_2$
(B) $L_1 \cap L_2$
(C) $L_1 \cap R$
(D) $L_1 \cup L_2$

88)The ability for a system of instructions to simulate a Turing Machine is called _____

a) Turing Completeness
b) Simulation
c) Turing Halting
d) None of the mentioned

89) **Following context free grammar**
S —> aB | bA
A —>b | aS | bAA
B —> b | bS | aBB
generates strings of terminals that have

A.equal number of a's and b's
B.odd number of a's and odd number b's
C.even number of a's and even number of b's
D.odd number of a's and even number of a's

90) **What is the highest type number which can be applied to the following grammar ?**
S —> Aa, A —> Ba, B —> abc

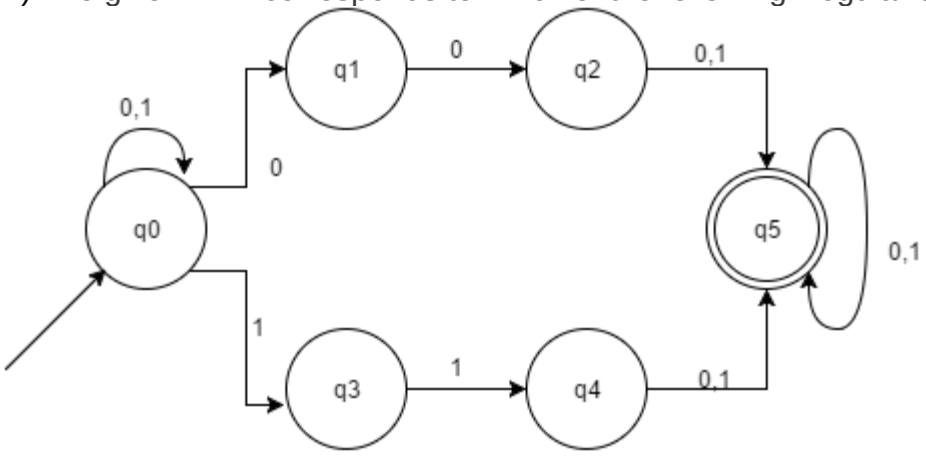
A) Type 0

B. Type 1

C. **Type 2**

D. Type 3

91) The given NFA corresponds to which of the following Regular expressions?



a) (0+1) *(00+11) (0+1) *
b) (0+1) *(00+11) *(0+1) *
c) (0+1) *(00+11) (0+1)
d) (0+1) (00+11) (0+1) *

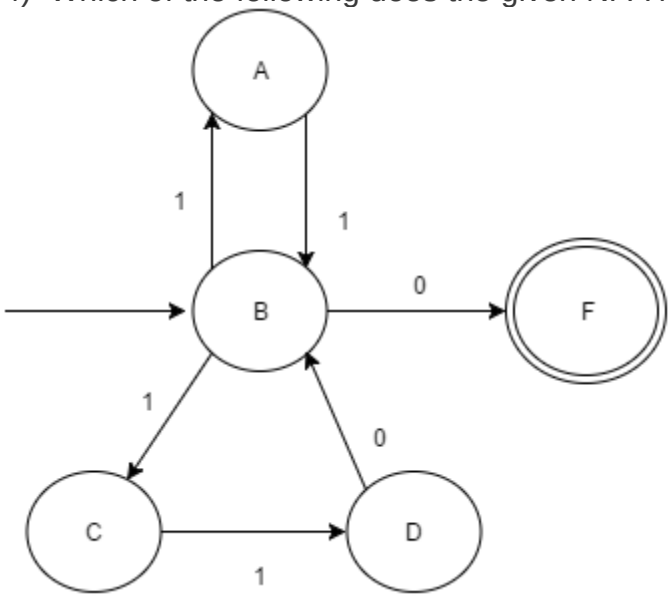
92)What is wrong in the given definition?
Def: ({q0, q1, q2}, {0,1}, δ, q3, {q3})
a) The definition does not satisfy 5 Tuple definition of NFA
b) There are no transition definition
c) Initial and Final states do not belong to the Graph
d) Initial and final states can't be same

93) From the given table, δ*(q0, 011) =?

Q	Δ(q,0)	δ(q,1)
q0	{q0}	{q0, q1}
q1	{q2}	{q2}
q2	{q3}	{q3}
q3	Φ	Φ

a) {q0}
b) {q1} U {q0, q1, q2}
c) {q2, q1}
d) {q3, q1, q2, q0}

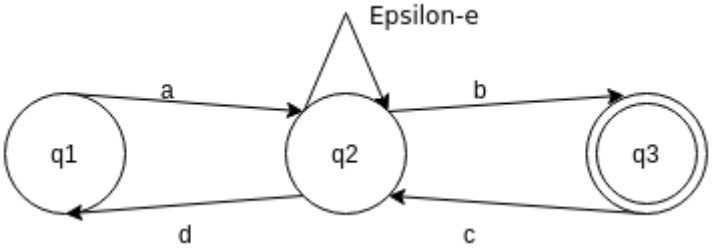
94) Which of the following does the given NFA represent?



a) {11, 101} * {01}
b) {110, 01} * {11}
c) {11, 110} * {0}
d) {00, 110} * {1}

95) The production of form non-terminal -> ε is called:
a) Sigma Production
b) Null Production
c) Epsilon Production
d) All of the mentioned

96) Can the given state diagram be reduced?



a) Yes
b) No

97) The behaviour of NFA can be simulated using DFA.
a) always
b) never
c) sometimes
d) none of the mentioned

98) For NFA with ε-moves, which among the following is correct?
a**) Δ: Q X (∑ U {ε}) -> P(Q)**
b) Δ: Q X (∑) -> P(Q)
c) Δ: Q X (∑*) -> P(Q)
d) All of the mentioned

99) State true or false:
Statement: A lexical analyzer reads the source code line by line.
a) True
b) False

100) In one move the turing machine:
a) May change its state
b) Write a symbol on the cell being scanned.
c) Move the head one position left or right
d) All of the above

_____Best of Luck_____