

Online Examinations (Even Sem/Part-I/Part-II Examinations 2020 - 2021)

Course Name - –Formal Language and Automata Theory

Course Code - MCA205

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Answer all the questions. Each question carry one mark.

9. 1.Which of the following is not a Non deterministic turing machine?

Mark only one oval.

- Alternating Turing machine
- Probabilistic Turing machine
- Read-only turing machine
- None of the mentioned

10. 2.The major difference between Mealy and Moore machine is about:

Mark only one oval.

- Output Variations
- Input Variations
- Both
- None of the mentioned

11. 3.Which of the following is true

Mark only one oval.

- $(01)^*0 = 0(10)^*$
- $(0+1)^*0(0+1)^*1(0+1) = (0+1)^*01(0+1)^*$
- $(0+1)^*01(0+1)^*+1^*0^* = (0+1)^*$
- All of the mentioned

12. 4.Choose the correct option: Statement 1: Recursive Inference, using productions from head to body. Statement 2: Derivations, using productions from body to head.

Mark only one oval.

- Statement 1 is true and Statement 2 is true
- Statement 1 and Statement 2, both are false
- Statement 1 is true and Statement 2 is false
- Statement 2 is true and Statement 1 is true

13. 5. Which among the following is true for the given statement? Statement : If there are strings R and T in a language L so that R is prefix of T and R is not equivalent to T.

Mark only one oval.

- No DPDA can accept L by empty stack
- DPDA can accept L by an empty stack
- L is regular
- None of the mentioned

14. 6. Which of the functions can a Turing machine not perform?

Mark only one oval.

- Copying a string
- Deleting a symbol
- Accepting a symbol
- Accepting a pal

15. 7. Which among the following is not notated as infinite language

Mark only one oval.

- Palindrome
- Reverse
- Factorial
- $L = \{ab\}^*$

16. 8.Which of the following is not a step in elimination of state procedure?

Mark only one oval.

- Unifying all the final states into one using e-transitions
- Unify single transitions to multi transitions that contains union of input
- Remove states until there is only starting and accepting states
- Get the resulting regular expression by direct calculation

17. 9.A $\rightarrow aA \mid a \mid b$, The number of steps to form aab:

Mark only one oval.

- 2
- 3
- 4
- 5

18. 10.The context free grammar which generates a Regular Language is termed as:

Mark only one oval.

- Context Regular Grammar
- Regular Grammar
- Context Sensitive Grammar
- None of the mentioned

19. 11.If d is not defined on the current state and the current tape symbol, then the machine _____

Mark only one oval.

- does not halts
 halts
 goes into loop forever
 none of the mentioned

20. 12.Let w be a string and fragmented by three variable x , y , and z as per pumping lemma. What does these variables represent?

Mark only one oval.

- string count
 string
 both (a) and (b)
 None of the mentioned

21. 13.Which among the following is not a part of the Context free grammar tuple?

Mark only one oval.

- End symbol
 Start symbol
 Variable
 Production

22. 14. Which of the functions are not performed by the Turing machine after reading a symbol?

Mark only one oval.

- writes the symbol
- moves the tape one cell left/right
- proceeds with next instruction or halts
- none of the mentioned

23. 15. The minimum number of transitions to pass to reach the final state as per the following regular expression is: $\{a,b\}^*\{baaa\}$

Mark only one oval.

- 4
- 5
- 6
- 3

24. 16. Production Rule: $aAb \rightarrow agb$ belongs to which of the following category

Mark only one oval.

- Regular Language
- Context free Language
- Context Sensitive Language
- Recursively Enumerable Language

25. 17.A non-deterministic two way, nested stack automaton has n-tuple definition. State the value of n.

Mark only one oval.

- 5
- 8
- 4
- 10

26. 18.Simplify the given grammar: $A \rightarrow a \mid aaA \mid abBc$ $B \rightarrow abba \mid b$

Mark only one oval.

- $A \rightarrow a \mid aaA \mid ababbAc \mid abbc$
- $A \rightarrow a \mid aaA \mid ababbAc \mid abbc, B \rightarrow abba \mid b$
- $A \rightarrow a \mid aaA \mid abbc, B \rightarrow abba$
- None of the mentioned

27. 19.Languages of a automata is

Mark only one oval.

- If it is accepted by automata
- If it halts
- If automata touch final state in its lifetime
- All language are language of automata

28. 20.Which of the following statements is not true?

Mark only one oval.

- Every language defined by any of the automata is also defined by a regular expression
- Every language defined by a regular expression can be represented using a DFA
- Every language defined by a regular expression can be represented using NFA with e moves
- Regular expression is just another representation for any automata definition

29. 21.The language of balanced parenthesis is

Mark only one oval.

- regular
- non regular
- may be regular
- none of the mentioned

30. 22.Choose the correct option: Statement: Unambiguity is the ideal structure of a language.

Mark only one oval.

- 1
- partially true
- 0
- can't be said

31. 23. Suppose $A \rightarrow xBz$ and $B \rightarrow y$, then the simplified grammar would be:

Mark only one oval.

- $A \rightarrow xyz$
- $A \rightarrow xBz|xyz$
- $A \rightarrow xBz|B|y$
- none of the mentioned

32. 24. A language can be generated from simple primitive language in a simple way if and only if

Mark only one oval.

- It is recognized by a device of infinite states
- It takes no auxiliary memory
- Both are correct
- Both are wrong

33. 25. Regular grammar is

Mark only one oval.

- context free grammar
- non context free grammar
- english grammar
- none of the mentioned

34. 26.A symbol X is _____ if there exists : $S \rightarrow^* aXb$

Mark only one oval.

- reachable
- generating
- context free
- none of the mentioned

35. 27.Which of the following Finite State Machine does not consist of?

Mark only one oval.

- input tape
- transition function
- output function
- final state

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

Mark only one oval.

- transitions
- states
- Both
- None of the mentioned

37. 29.The language accepted by Push down Automaton

Mark only one oval.

- Recursive Language
- Context free language
- Linearly Bounded language
- All of the mentioned

38. 30.The production of the form $A \rightarrow B$, where A and B are non-terminals is called

Mark only one oval.

- Null production
- Unit production
- Greibach Normal Form
- Chomsky Normal Form

39. 31.Which among the following is incorrect for o-machines?

Mark only one oval.

- Oracle Turing machines
- Can be used to study decision problems
- Visualizes Turing machine with a black box which is able to decide certain decision problems in one operation
- None of the mentioned

40. 32. Given Language $L = \{x \mid \mu \{a, b\}^* | x \text{ contains aba as its substring}\}$ Find the difference of transitions made in constructing a DFA and an equivalent NFA?

Mark only one oval.

- 2
- 3
- 4
- Cannot be determined.

41. 33. Which of the following one can relate to the given statement: Statement: If n items are put into m containers, with $n > m$, then at least one container must contain more than one item.

Mark only one oval.

- Pumping lemma
- Pigeon Hole principle
- Count principle
- None of the mentioned

42. 34. Which of the following statement is correct?

Mark only one oval.

- All Regular grammar are context free but not vice versa
- All context free grammar are regular grammar but not vice versa
- Regular grammar and context free grammar are the same entity
- None of the mentioned

43. 35.Which of the following automata takes stack as auxiliary storage?

Mark only one oval.

- Finite automata
- Push down automata
- Turing machine
- All of the mentioned

44. 36.Turing machine can be represented using the following tools:

Mark only one oval.

- Transition graph
- Transition table
- Queue and Input tape
- All of the mentioned

45. 37.Which of the following options is correct? Statement 1: Initial State of NFA is Initial State of DFA. Statement 2: The final state of DFA will be every combination of final state of NFA.

Mark only one oval.

- Statement 1 is true and Statement 2 is true
- Statement 1 is true and Statement 2 is false
- Statement 1 can be true and Statement 2 is true
- Statement 1 is false and Statement 2 is also false

46. 38.Which of the following statement is false

Mark only one oval.

- Context free language is the subset of context sensitive language
- Regular language is the subset of context sensitive language
- Recursively enumerable language is the super set of regular language
- Context sensitive language is a subset of context free language

47. 39.A push down automaton with only symbol allowed on the stack along with fixed symbol.

Mark only one oval.

- Embedded PDA
- Nested Stack automata
- DPDA
- Counter Automaton

48. 40.Every grammar in Chomsky Normal Form is:

Mark only one oval.

- regular
- context sensitive
- context free
- all of the mentioned

49. 41. Finite automata requires minimum _____ number of stacks

Mark only one oval.

- 1
- 0
- 2
- None of the mentioned

50. 42. Which of the following are non regular

Mark only one oval.

- The set of strings in $\{a,b\}^*$ with an even number of a 's
- The set of strings in $\{a, b, c\}^*$ where there is no c anywhere to the left of a
- None of the mentioned
- The set of strings in $\{0, 1\}^*$ that encode, in binary, an integer w that is a multiple of 3. Interpret the empty strings ϵ as the number 0

51. 43. Which of the following are always unambiguous?

Mark only one oval.

- Deterministic Context free grammars
- Non-Deterministic Regular grammars
- Context sensitive grammar
- None of the mentioned

52. 44. Given Grammar: $S \rightarrow A$, $A \rightarrow aA$, $A \rightarrow e$, $B \rightarrow bA$ Which among the following productions are Useless productions?

Mark only one oval.

- $S \rightarrow A$
 $A \rightarrow aA$
 $A \rightarrow e$
 $B \rightarrow bA$

53. 45. There are _____ tuples in the finite state machine

Mark only one oval.

- 4
 5
 6
 Unlimited

54. 46. Regular expressions are

Mark only one oval.

- Type 0 language
 Type 1 language
 Type 2 language
 Type 3 language

55. 47.Which of the following is false for a grammar G in Chomsky Normal Form:

Mark only one oval.

- G has no useless symbols
- G has no unit productions
- G has no epsilon productions
- None of the mentioned

56. 48.Which of the given are correct

Mark only one oval.

- Moore machine has 6-tuples
- Mealy machine has 6-tuples
- Both Mealy and Moore has 6-tuples
- None of the mentioned

57. 49.The behaviour of NFA can be simulated using DFA.

Mark only one oval.

- always
- never
- sometimes
- none of the mentioned

58. 50. Which of the following the given language belongs to? $L = \{ambmcm \mid m \geq 1\}$

Mark only one oval.

- Context free language
- Regular language
- Both (a) and (b)
- None of the mentioned

59. 51. Which of the following is not true about RASP?

Mark only one oval.

- Binary search can be performed more quickly using RASP than a turing machine
- Stores its program in memory external to its state machines instructions
- Has infinite number of distinguishable, unbounded registers
- Binary search can be performed less quickly using RASP than a turing machine

60. 52. Which of the following option is correct

Mark only one oval.

- NFA is slower to process and its representation uses more memory than DFA
- DFA is faster to process and its representation uses less memory than NFA
- NFA is slower to process and its representation uses less memory than DFA
- DFA is slower to process and its representation uses less memory than NFA

61. 53.Which of the following is a utility of state elimination phenomenon

Mark only one oval.

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

62. 54.Which of the following is/are the suitable approaches for inferencing

Mark only one oval.

- Recursive Inference
- Derivations
- Both Recursive Inference and Derivations
- None of the mentioned

63. 55.A context free grammar can be recognized by

Mark only one oval.

- Push down automata
- 2 way linearly bounded automata
- Both (a) and (b)
- None of the mentioned

64. 56. An automaton that presents output based on previous state or current input:

Mark only one oval.

- Acceptor
- Classifier
- Transducer
- None of the mentioned

65. 57. Which among the following cannot be accepted by regular grammar

Mark only one oval.

- L is a set of numbers divisible by 2
- L is a set of binary complement
- L is a set of string with odd number of 0
- L is a set of 0^n1^n

66. 58. A string is accepted by a PDA when

Mark only one oval.

- Stack is empty
- Acceptance state
- Both (a) and (b)
- None of the mentioned

67. 59.A turing machine is a

Mark only one oval.

- real machine
- abstract machine
- hypothetical machine
- more than one option is correct

68. 60.Regular expression for all strings starts with ab and ends with bba is

Mark only one oval.

- aba^*b^*bba
- $ab(ab)^*bba$
- $ab(a+b)^*bba$
- All of the mentioned

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