

JNTU ONLINE EXAMINATIONS [Mid 2 - flat]

1. A CFL for which every CFG is ambiguous is said to be an _____ ambiguous CFL. [01D01]

- a. implicitly
- b. inherently**
- c. Explicitly
- d. inequal

2. A _____ for which every _____ is ambiguous is said to be an inherently ambiguous CFL. [01D02]

- a. CFL,CFL
- b. CFG,CFG
- c. CFL,CFG**
- d. CFG,CFL

3. In a CFG each production is of the form $A \rightarrow \alpha$, where A is a variable and α is a string of symbols from _____

_____ [01M01]

- a. $(V \cup T)^*$**
- b. V^*
- c. T^*
- d. $(V \cup T)$

4. Let $G=(V,T,P,S)$ be a CFG. A tree is a derivation (or parse) tree for G if If vertex n has label ϵ then n is a _____ node [01M02]

- a. root
- b. interior
- c. root or interior
- d. leaf**

5. Let $G=(V,T,P,S)$ be a CFG. A tree is a derivation (or parse) tree for G if If vertex n has label ϵ then n is a leaf node and the father of n has _____ Sons. [01M03]

- a. 1**
- b. 2
- c. 3
- d. 4

6. A CFG $G=$ _____ [01S01]

- a. (V,T)
- b. (V,T,P)
- c. (V,T,S)
- d. (V,T,P,S)**

7. In a CFG each production is of the form _____ [01S02]

- a. $\alpha \rightarrow A$
- b. $\alpha \rightarrow \epsilon$
- c. $A \rightarrow A$
- d. $A \rightarrow \alpha$**

8. A CFG G such that some word has _____ parse trees is said to be ambiguous . [01S03]

- a. exactly 4
- b. exactly 3
- c. ≥ 2**
- d. ≥ 1

9. A CFG is ambiguous if some word has _____ left most derivations [01S04]

- a. 1
- b. < 1
- c. > 1**
- d. exactly 5

10. A CFG is ambiguous if some word has _____ right most derivations [01S05]

- a. 1
- b. < 1
- c. > 1**
- d. exactly 5

11. The following CFG $S \rightarrow aB \mid bA$ $A \rightarrow b \mid aS \mid bAA$ $B \rightarrow b \mid bS \mid aBB$ Generates strings of terminals that have [02D01]

- a. equal number of a's and b's**
- b. odd number of a's and odd number of b's. even number of a's and even number of b's
- d. odd number of a's and even number of a's

12. The set $\{a^n b^n \mid n = 1, 2, 3, \dots\}$ can be generated by the CFG [02D02]

- a. $S \rightarrow ab \mid aSb$**
- b. $S \rightarrow aaSbb \mid ab$

c. $S \rightarrow ab|aSb|\epsilon$

d. $S \rightarrow ab$

13. The grammar generated by production rules $S \rightarrow aSB$, abc , $cB \rightarrow Bc$, $aB \rightarrow aa$ is $a^n b^n c^n$ for _____ [02M01]

a. $n > 1$

b. $n \geq 0$

c. $n > 0$

d. $n \leq 0$

14. A production of the form $A \rightarrow \lambda$ is called _____ production [02M02]

a. λ

b. null able or λ

c. multi

d. normal

15. A production of the form $A \rightarrow BA$, $B \in T$ is called _____ production [02M03]

a. unit

b. null able

c. multi

d. normal

16. A grammar G is known to have GNF representation then [02S01]

a. we can write G as left linear or right linear

b. G may be written as left linear or right linear

c. G can't be written left or right linear

d. We can write G as left linear

17. Every CFG is ambiguous [02S02]

a. True

b. False

c. some times True

d. some times False

18. CFG is not closed under [02S03]

a. Union

b. kleene star

c. Complementation

d. Product

19. Let two kinds of grammars be defined as follows

i) A a, A BC

ii) A aa [02S04]

a. ii denotes CNF and i denotes GNF

b. ii denotes CNF and i does n't denote GNF

c. i denote CNF and ii denotes GNF

d. i denote CNF and ii does n't denote GNF

20. What is the first step to construct an equivalent reduced grammar for G [02S05]

a. Construct G1 such that each variable derives some terminal string

b. Construct G1 such that each symbol G1 appears in some sentential form

c. Eliminate null productions

d. Eliminate unit productions

21. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ _____ is in L [03D01]

a. $v^i x^i$

b. $u v^i x^i$

c. $u v^i w x^i$

d. $u v^i w x^i y$

22. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and _____ then we may write _____ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u v^i w x^i y$ is in L [03D02]

a. $|z| \geq n$, $z = uvwxy$

b. $|z| \geq n$, $z = uv$

c. $|z| \geq n$, $z = wxy$

d. $|z| \geq n$, $z = vwx$

23. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

And. $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u v^i w x^i y$ is in L [03M01]

a. $< n$

b. $\leq n$

c. $> n$

d. $\geq n$

24. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u v^i w x^i y$ is in L [03M02]

a. $i \geq 0$

b. $i = 0$

c. $i < 0$

d. $i \leq 0$

25. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u v^i w x^i y$ is in L [03M03]

a. $i \geq 0$

b. $i = 0$

c. $i < 0$

d. $i \leq 0$

26. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u v^i w x^i y$ is in L [03S01]

a. $|z| < n$

b. $|z| > n$

c. $|z| = n$

d. $|z| \geq n$

27. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u v^i w x^i y$ is in L [03S02]

a. $z = uv$

b. $z = wxy$

c. $z = vw$

d. $z = uvwxy$

28. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u v^i w x^i y$ is in L [03S03]

a. $|vx| > 1$

b. $|vx| = 1$

c. $|vx| < 1$

d. $|vx| \geq 1$

29. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx|$ is _____

2) $|vwx| \leq n$

3) for all $i \geq 0$ $u^i v^i w^i x^i y$ is in L

[03S04]

a. < 1

b. > 1

c. ≥ 1

d. $= 1$

30. Pumping lemma for CFL : Let L be any CFL .Then there is a constant n depending only on L ,such that if z is in L

and $|z| \geq n$ then we may write $z = uvwxy$ such that

1) $|vx| \geq 1$

2) _____

3) for all $i \geq 0$ $u^i v^i w^i x^i y$ is in L

[03S05]

a. $|vwx| < n$

b. $|vwx| = n$

c. $|vwx| > n$

d. $|vwx| \leq n$

31. If L is a CFL and R is a regular set then L intersection R is a _____ [04D01]

a. regular

b. CFL

c. regular or CFL

d. can't say

32. If L is a CFL and R is a regular set then L intersection R is a CFL is _____ [04D02]

a. True

b. False

c. True or False

d. can't say

33. Context free languages are closed under ``inverse homomorphism" is _____ [04M01]

a. True

b. False

c. True or False

d. Can't say

34. Context free languages are closed under "intersection" is _____ [04M02]

a. True

b. False

c. True or False

d. can't say

35. Context free languages are closed under ``complementation" is _____ [04M03]

a. True

b. False

c. True or False

d. Can't say

36. Context free languages are closed under ``complementation" is _____ [04M04]

a. True

b. False

c. True or False

d. Can't say

37. Context free languages are closed under "union" is _____ [04S01]

a. True

b. False

c. True or False

d. can't say

38. Context free languages are closed under ``Concatenation" is _____ [04S02]

a. True

b. False

c. True or False

d. Can't say

39. Context free languages are closed under ``Kleene closure" is _____ [04S03]

a. True

b. False

- c. True or False
- d. Can't say

40. Context free languages are closed under ``Substitution" is _____ [04S04]

- a. True**
- b. False
- c. True or False
- d. Can't say

41. Context free languages are closed under ``homorphism" is _____ [04S05]

- a. True**
- b. False
- c. True or False
- d. Can't say

42. NPDA = (S, Σ , Γ , δ , s, X). s belongs to _____ [05D01]

- a. s
- b. X
- c. δ
- d. S**

43. NPDA = (S, Σ , Γ , δ , s, X). X belongs to _____ [05D02]

- a. Γ
- b. s
- c. X
- d. S**

44. NPDA = (S, Σ , Γ , δ , s, X). _____ is a transition function [05M01]

- a. δ**
- b. S
- c. X
- d. s

45. NPDA = (S, Σ , Γ , δ , s, X). _____ is the initial state of the control unit [05M02]

- a. S
- b. s**
- c. X
- d. Σ

46. NPDA = (S, Σ , Γ , δ , s, X). _____ is the initial stack symbol [05M03]

- a. S
- b. s
- c. X**
- d. Γ

47. LIFO is related to _____ [05S01]

- a. queue
- b. stack**
- c. list
- d. array

48. NPDA = (S, Σ , Γ , δ , s, X). _____ represents finite set of states [05S02]

- a. S**
- b. Σ
- c. Γ
- d. δ

49. NPDA = (S, Σ , Γ , δ , s, X). _____ presents finite set of input symbols [05S03]

- a. S
- b. Σ**
- c. Γ
- d. δ

50. NPDA = (S, Σ , Γ , δ , s, X). _____ represents auxiliary symbols [05S04]

- a. S
- b. X
- c. Γ**
- d. s

51. NPDA = (S, Σ , Γ , δ , s, X). _____ represents stack symbols [05S05]

- a. S
- b. X
- c. s
- d. Γ**

52. Consider the following grammar

S - a ABB | aAA

A $\rightarrow aBB|a$

B $\rightarrow bBB|A$

In NPDA for above G

$\delta(Q_1, a, B) = \text{-----}$ [06D01]

- a. $\{ (Q_1, ABB), (Q_1, AA) \}$
- b. $\{ (Q_1, BB), (Q_1, \lambda) \}$
- c. $\{ (Q_1, BB) \}$
- d. (Q_1, λ)

53. Consider the following grammar

S $\rightarrow aABB|aAA$

A $\rightarrow aBB|a$

B $\rightarrow bBB|A$

In NPDA for above G

$\delta(Q_1, b, A) = \text{-----}$ [06D02]

- a. $\{ (Q_1, ABB), (Q_1, AA) \}$
- b. (Q_1, λ)
- c. $\{ (Q_1, BB) \}$
- d. $\{ (Q_1, BB), (Q_1, \lambda) \}$

54. Linear bonded automaton ----- [06M01]

- a. RL
- b. CFL
- c. Recursively enumerable language
- d. CSL

55. Consider the following grammar

S $\rightarrow aABB|aAA$

A $\rightarrow aBB|a$

B $\rightarrow bBB|A$

In NPDA for above G

$\delta(Q_1, a, S) = \text{-----}$

[06M02]

- a. $\{ (Q_1, ABB), (Q_1, AA) \}$
- b. $\{ (Q_1, BB), (Q_1, \lambda) \}$
- c. $\{ (Q_1, BB) \}$
- d. $\{ (Q_1, BB), (Q_1, \lambda) \}$

56. Consider the following grammar

S $\rightarrow aABB|aAA$

A $\rightarrow aBB|a$

B $\rightarrow bBB|A$

In NPDA for above G

$\delta(Q_1, a, A) = \text{-----}$ [06M03]

- a. $\{ (Q_1, ABB), (Q_1, AA) \}$
- b. $\{ (Q_1, BB), (Q_1, \lambda) \}$
- c. $\{ (Q_1, BB) \}$
- d. $\{ (Q_1, BB), (Q_1, \lambda) \}$

57. Non deterministic push down automaton : ----- [06S01]

- a. RL
- b. CFL
- c. DCFL
- d. CSL

58. Turing machine : ----- [06S02]

- a. RL
- b. CFL
- c. Recursively enumerable language
- d. CSL

59. Deterministic push down automaton : ----- [06S03]

- a. RL
- b. CFL
- c. Recursively enumerable language
- d. DCFL

60. Non deterministic finite state acceptor ----- [06S04]

- a. RL
- b. CFL
- c. Recursively enumerable language
- d. CSL

61. Turing machine that halts ----- [06S05]

- a. recursive language

- b. CFL
- c. Recursively enumerable language
- d. CSL

62. For LR(1) grammar there exists a : [07D01]

a. NPDA

- b. DFA
- c. e-NFA
- d. NPDA & DFA

63. If G is an LR(k) grammar there exists a DPDA A accepting L(G) [07D02]

a. True

- b. False
- c. T or F
- d. can't say

64. A PDA is deterministic if :

i) $\delta(q, \lambda, z) \neq \Phi$ implies $\delta(q, a, z) = \Phi$ for all a belongs to Z

ii) $\delta(q, a, z)$ is [07M01]

- a. empty
- b. singleton

c. empty or singleton

- d. empty and singleton

65. Which of the following can not be accepted by DPDA [07M02]

- a. wⁿwt
- b. $a^n b^n$
- c. $a^n b^n$ union $a^m b^{2m}$
- d. $a^n b^n$

66. The language [wwr] is accepted by [07M03]

- a. DPDA not by a NPDA
- b. DPDA and NPDA
- c. NPDA not by a DPDA
- d. can not say

67. Which of the following is accepted by an NPDA and not DPDA [07S01]

- a. All strings in which a given symbol is present atleast twice
- b. Even palindromes
- c. String ending with a particular alphabet
- d. All strings in which a given symbol is present atleast thrice

68. A pda is said to be deterministic if : [07S02]

- a. $\delta(q, a, Z)$ is either empty or singleton or $(q, \lambda, Z) = \Phi$ implies $\delta(q, a, Z) \neq \Phi$
- b. $\delta(q, a, Z)$ is either empty or singleton & $(q, \lambda, Z) \neq \Phi$ implies $\delta(q, a, Z) = \Phi$
- c. $\delta(q, a, Z)$ is either empty or singleton & $(q, \lambda, Z) = \Phi$ implies $\delta(q, a, Z) \neq \Phi$
- d. $\delta(q, a, Z)$ is either empty or singleton or $(q, \lambda, Z) \neq \Phi$ implies $\delta(q, a, Z) \neq \Phi$

69. Which of the following statement is false ? [07S03]

- a. A language is LR if it can be accepted by a DPDA
- b. A language is CFL if it can be accepted by a NPDA
- c. Inherently ambiguous languages can be modeled by LR grammars
- d. The class of sets accepted by pda properly includes the regular sets

70. If A is a DPDA A there exists an LR(1) grammar G such that L(G) = N(A) [07S04]

- a. True
- b. False
- c. T or F
- d. can't say

71. Which of the following is not accepted by DPDA [07S05]

- a. All strings in which a given symbol is present atleast twice
- b. Even palindromes
- c. String ending with a particular alphabet
- d. All strings in which a given symbol is present atleast thrice

72. If L is N(M) for some PDA M then L is a : [08D01]

- a. DCFL
- b. CFL
- c. RE
- d. CSL

73. Let L1 be the set of languages accepted by a NPDA L2 be the set of CFL then [08D02]

- a. $L1 = L2$
- b. $L1 \subset L2$
- c. $L2 \subset L1$
- d. no relation

74. Which of the following languages not is accepted by a NPDA w -- -- *: [08M01]

- a. wwr

b. WW

c. WCW^r

d. $a^n b^{2n}$

75. Running time of a FA like NPDA for an input string of length n is [08M02]

a. linear in n

b. polynomial in n

c. exponential in n

d. can be anything depending on the automata

76. If S is the number of states in NDFA then equivalent DFA can have maximum of _ _ _ _ _

[08M03]

a. S states

b. S-1 states

c. 2s states

d. 2S -1 states

77. Let L_d be the set of all languages accepted by a PDA by final states and L_e the Set of all languages accepted by empty stack Which of the following is true ? [08S01]

a. $L_d = L_e$

b. L_d is sub set to L_e

c. L_d is superset to L_e

d. can't say

78. A PDA behaves like an FA when the number of auxiliary memory it has is [08S02]

a. 0

b. 1 or more

c. 2 or more

d. 3 or more

79. Choose the correct statements : [08S03]

a. the power of DFA and NDFA are almost same

b. the power of DFA and NDFA are different

c. the power of NPDA and DPDA are same

d. the power of NPDA and DPDA are same

80. A regular set accepted by DFA with n states is accepted to final state by a DPDA with n states and at least _ _ _ _

_ _ _ _ _ pushdown symbols [08S04]

a. 1

b. 2

c. 3

d. 4

81. Every regular set accepted by FA with n states is accepted by a DPDA with _ _ _ _ _ states and n

pushdown symbols [08S05]

a. 1

b. 2

c. n

d. 3

82. Let Σ be an alphabet with $|\Sigma| > 1$. There exist DCFLs L_1 and L_2 a substitution S such that $S(L_1)$ is not DCFL is _ _

_ _ _ _ _ [09D01]

a. True

b. False

c. true or false

d. can't say

83. Let Σ be an alphabet with $|\Sigma| > 1$. There exist DCFLs L_1 and L_2 a substitution s such that $L_1 R$ is DCFL is _ _ _ _ _

_ _ _ _ _ [09D02]

a. True

b. False

c. true or false

d. can't say

84. Let Σ be an alphabet with $|\Sigma| > 1$. There exist DCFLs L_1 and L_2 a substitution s such that $L_1 U L_2$ is not DCFL is _

_ _ _ _ _ [09M01]

a. True

b. False

c. true or false

d. can't say

85. Let Σ be an alphabet with $|\Sigma| > 1$. There exist DCFLs L_1 and L_2 a substitution s such that $L_1.L_2$ is not DCFL is ____
[09M02]

- a. True
- b. False
- c. true or false
- d. can't say

86. Let Σ be an alphabet with $|\Sigma| > 1$. There exist DCFLs L_1 and L_2 a substitution s such that L_1^* is not DCFL is ____
[09M03]

- a. True
- b. False
- c. true or false
- d. can't say

87. Let L be a language accepted by a DPDA then compliment(L) can also be accepted by a DPDA." Is ____
[09S01]

- a. True
- b. False
- c. true or false
- d. can't say

88. Let L be a DCFL . R be a regular language then compliment(L) is a DCFL is ____
[09S02]

- a. True
- b. False
- c. true or false
- d. can't say

89. Let L be a DCFL . R be a regular language then L^*R is not a DCFL is ____
[09S03]

- a. True
- b. False
- c. true or false
- d. can't say

90. Let L be a DCFL . R be a regular language then LUR is not a DCFL is ____
[09S04]

- a. True
- b. False
- c. true or false
- d. can't say

91. Let L be a DCFL . R be a regular language then $L-R$ is not a DCFL is ____
[09S05]

- a. True
- b. False
- c. true or false
- d. can't say

92. An Finite state machine can be considered to be a TM [10D01]

- a. a finite tape length with rewinding and unidirectional movement
- b. a finite tape length without rewinding capability and unidirectional tape movement
- c. a finite tape length without rewinding and bidirectional movement
- d. a finite tape length rewinding capability and bidirectional tape movement

93. A TM is more powerful than finite state machine because [10D02]

- a. tape movement is confined to one direction
- b. it has no finite state control
- c. it has the capability to remember arbitrary long input symbols
- d. TM is not powerful than FSM

94. Pick the odd man out [10M01]

- a. Turing machine with stay option
- b. Turing machine with semi infinite tapes
- c. NDTM
- d. standard TM

95. Find the false statement [10M02]

- a. We construct TM to carry out some algorithm
- b. We construct TM to accept a given language
- c. TM is not capable of performing any calculation which can be performed by computer
- d. TM is simple mathematical model of general purpose computer

96. Any TM with m symbols and n states can be simulated by another TM with just 2 symbols and less than [10M03]

- a. $8mn$ states
- b. $4mn + 8$ states
- c. $8mn + 4$ states
- d. mn states**

97. Comparing TM and computers we find [10S01]

- a. computers have more computational power**
- b. TM have more computational power
- c. Both are equivalent
- d. They can not be compared

98. The no of symbols necessary to simulate any TM with m symbols and n states is [10S02]

- a. $m+n$
- b. $8mn + 4m$
- c. mn**
- d. $4mn+m$

99. The class of unrestricted language corresponds to [10S03]

- a. TM**
- b. LBA
- c. PDA
- d. FA

100. The class of TM is equivalent to the class of [10S04]

- a. Type 0**
- b. Type 1
- c. Type 2
- d. Type 3

101. Turing machines are similar to FA but have _ _ _ _ _ [10S05]

- a. finite and read only memory
- b. unlimited and read only memory
- c. finite and read write memory**
- d. unlimited and read write memory

102. Consider a new type of turing machine where the head can move left and move right but can not stay put. This new type of turing machine is _ _ _ _ _ [11D01]

- a. less powerful than the original TM
- b. equivalent in power to the original TM**
- c. more powerful than the original TM
- d. not comparable

103. Non deterministic TM are more power ful than deterministic TM [11D02]

- a. absolutely true
- b. may be true
- c. may not be true
- d. absolutely false**

104. A Turing machine computes by going from one configuration to another. We say that configuration C1 yields configuration C2 if the turing machine can legally move form C1 to C2 in _ _ _ _ _ [11M01]

- a. a single step
- b. a finite number of steps
- c. an infinite number of steps**
- d. two steps

105. By giving Turing machine more complex power we can increase the power of the turing machine [11M02]

- a. absolutely true
- b. may be true
- c. may not be true
- d. absolutely false**

106. The statement "standard TM accepts the same languages as are accepted by a stay TM is _ _ _ _ _ [11M03]

- a. true only if languages is a CFL
- b. true only if languages is regular
- c. true for all languages**
- d. always false

107. Turing machines can do _ _ _ _ _ [11S01]

- a. every thing that a real computer can do
- b. more than a real computer can do
- c. less than a real computer can do
- d. nothing**

108. Turing machines use what as their memory [11S02]

a. ROM

b. RAM

c. finite tape

d. infinite tape

109. Turing machines can move how in memory ? [11S03]

a. forward

b. backward

c. forward and backward

d. it cannot move

110. Find the false statement [11S04]

a. standard TM is equivalent to multitape TM

b. standard TM is equivalent to NDTM

c. standard TM is equivalent to LBA

d. LBA is restricted TM from both sides

111. The LBA is a variant of [11S05]

a. TM

b. PDA

c. FA

d. NFA

112. The production $A \rightarrow B$ where $A \in V$, $B \in (V \cup T)^*$ is related to _____ grammar [12D01]

a. type 0

b. type 1

c. type 2

d. type 3

113. The production $A \rightarrow xB$ where $A \in V$, $B \in (V \cup \lambda)$, $x \in \Sigma$ is related to _____ grammar [12D02]

a. type 0

b. type 1

c. type 2

d. type 3

114. The production $U \rightarrow V$ where $U \in (V \cup T)^+$, $V \in (V \cup T)^*$ is related to _____ grammar [12M01]

a. type 0

b. type 1

c. type 2

d. type 3

115. The production $U \rightarrow V$ where $U, V \in (V \cup T)^+$, $|U| \leq |V|$, is related to _____ grammar [12M02]

a. type 0

b. type 1

c. type 2

d. type 3

116. Recursive enumerable languages is also known as _____ languages. [12M03]

a. type 0

b. type 1

c. type 2

d. type 3

117. Context sensitive languages is also known as _____ languages [12S01]

a. type 0

b. type 1

c. type 2

d. type 3

118. Context free languages is also known as _____ languages [12S02]

a. type 0

b. type 1

c. type 2

d. type 3

119. Regular languages is also known as _____ languages [12S03]

a. type 0

b. type 1

c. type 2

d. type 3

120. Which of the following is superset to all ? [12S04]

a. type 0

b. type 1

c. type 2

d. type 3

121. Which of the following is subset to all ? [12S05]

- a. type 0
- b. type 1
- c. type 2

d. type 3

122. LBA (NDTM) $= (S, A, \delta, S_0, \Delta L, \Delta R, F)$. $\delta(S_i, \delta L) =$ _____ [13D01]

- a. $(S_i, \delta R, R)$
- b. $(S_i, \delta R, L)$
- c. $(S_i, \delta L, R)$
- d. $(S_i, \delta R, L)$

123. LBA (NDTM) $= (S, A, \Delta, S_0, \Delta L, \Delta R, F)$. $\delta(S_i, \Delta R) =$ _____ [13D02]

- a. $(S_j, \Delta R, R)$
- b. $(S_j, \Delta R, L)$
- c. $(S_j, \Delta L, R)$
- d. $(S_j, \Delta R, L)$

124. Let B be a LBA. Then grammar corresponding to $L(B)$ is _____ [13M01]

- a. CSL
- b. CFL
- c. Unrestricted grammar
- d. regular grammar

125. Which of the following is not a variant of the standard Turing machine? [13M02]

- a. LBA
- b. PDA
- c. universal Turing machine
- d. TM

126. LBA (NDTM) $= (S, A, \delta, S_0, \Delta L, \Delta R, F)$. _____ is input alphabet. [13M03]

- a. ΔL
- b. ΔR
- c. $\Delta L, \Delta R$
- d. δ

127. Which automata is associated with context sensitive language ? [13S01]

- a. turing machine
- b. finite automata
- c. PDA
- d. LBA

128. LBA is _____ [13S02]

- a. unrestricted TM
- b. restricted TM from one side
- c. restricted TM from both sides
- d. can't say

129. Which of the following is true : Read Write head can move [13S03]

- a. to the left of left endmarker in LBA
- b. to the right of left endmarker in LBA
- c. to the right of right end marker in LBA
- d. it can't move

130. The LBA is a variant of _____ [13S04]

- a. TM
- b. PDA
- c. FA
- d. FA or PDA

131. LBA is a NDTM is _____ [13S05]

- a. True
- b. False
- c. True or False
- d. can't say

132. Give the type of the following grammars P begin D ; C end $D \rightarrow d|d; DC \rightarrow c|c; C$ [14D01]

- a. LR(0)
- b. LR(1)
- c. LL
- d. LR(2)

133. The grammar $S \rightarrow aAb, A \rightarrow aAb|a$ is: [14M01]

- a. LR(1)
- b. LR(0)
- c. LR(2)
- d. LR(3)

134. Give the type of the following grammars $S \rightarrow aSa|bSb|c$ [14M02]

- a. LR(0)

- b. LR(1)
- c. LL
- d. LR(2)

135. Give the type of the following grammars $S \rightarrow A, A \rightarrow A B | \lambda, B \rightarrow a B | \lambda$ [14M03]

- a. LR(0)
- b. LR(1)**
- c. LL
- d. LR(2)

136. YACC (YET ANOTHER COMPILER COMPILER) uses grammar which is [14S01]

- a. LL
- b. LR
- c. ALR**
- d. LL or LR

137. Consider grammar represented by $S \rightarrow aA, A \rightarrow Ab b | b$ [14S02]

- a. LR(1)
- b. LR(0)**
- c. LR(2)
- d. LR(3)

138. For LR(1) grammar there exists [14S03]

- a. NPDA**
- b. DFA
- c. e-NFA
- d. TM

139. There is an algorithm to decide whether a given context free grammar is LR(k) for a given natural number k" is _____ [14S04]

- a. true**
- b. false
- c. true or false
- d. can't say

140. Give the type of the following grammar $S \rightarrow aSa | b S b | \lambda$ [14S05]

- a. LR(0)
- b. LR(1)**
- c. LL
- d. LR(2)

141. Find the incorrect statement [15D01]

- a. set of real numbers is not enumerable**
- b. if a set S is infinite countable then its power set is not countable
- c. if L is not recursively enumerable then its complement cannot be recursive
- d. family of recursive is a equivalent to family of recursively enumerable

142. Which of the following statements is true? [15D02]

- a. A set X is recursive if we have a algorithm to decide whether a given element belongs to X or not
- b. A recursive set is recursively enumerable**
- c. A context sensitive language is recursive
- d. set of real numbers is not enumerable

143. Find the false statement [15M01]

- a. L is recursively enumerable then so is compliment of L
- b. L is recursive then so is complement of L
- c. L is recursive then compliment of L is recursively enumerable
- d. If L and complement of L are recursively enumerable then both are recursive**

144. Which of the following is not primitive recursive [15M02]

- a. addition
- b. division
- c. LCM

d. Ackerman's function

145. Let A=set of recursive languages B= set of recursively enumerable languages Then [15M03]

- a. A is a subset of B
- b. B is a subset of A
- c. A and B are the same set

d. A and B are disjoint sets

146. Set of all Turing machines is [15S01]

- a. uncountable**
- b. countable but infinite
- c. finite
- d. void

147. If there exists a language L for which there exists a TM, T that accepts every word in L and either rejects or loops for every word that is not in L is said to be [15S02]

- a. recursive
- b. recursively enumerable**
- c. NP-HARD
- d. NP-COMPLETE

148. If we have an algorithm to determine whether a given element belongs to a set X or not then this set is called [15S03]

- a. recursive
- b. recursively enumerable**
- c. complete
- d. context sensitive

149. If we have a procedure to determine whether a given element belongs to a set X or not then this set is called [15S04]

- a. recursive
- b. recursively enumerable
- c. complete**
- d. context sensitive

150. Find the correct statement [15S05]

- a. recursively enumerable implies recursive
- b. recursive implies recursively enumerable
- c. recursive is same as recursively enumerable
- d. type 3 is also called as Regular Language**

151. Which of the following properties of recursively enumerable set is recursively enumerable [16D01]

- a. $L = \emptyset$
- b. $L - L_u \neq \emptyset$**
- c. L is recursive
- d. $L = \sum^*$

152. Which of the following properties of recursively enumerable set is not recursively enumerable [16D02]

- a. $L \neq \emptyset$
- b. $L - L_u \neq \emptyset$**
- c. L contains at least 10 members
- d. $L = \sum^*$

153. Which one is false [16M01]

- a. every recursive enumerable language is recursive
- b. complement of a recursive language is again recursive**
- c. If L & complement L both are recursive enumerable then L is recursive
- d. L is recursive then TM halts for every x belongs to L

154. A problem whose language is recursive is said to be [16M02]

- a. decidable
- b. undecidable**
- c. decidable or undecidable
- d. can't say

155. The complement of recursive is [16M03]

- a. recursive
- b. non recursive
- c. recursive or non recursive
- d. neither recursive nor non recursive**

156. Any language generated by an unrestricted grammar is [16S01]

- a. recursive**
- b. recursively enumerable
- c. not recursively enumerable
- d. not recursive

157. The family of recursive languages is not closed under which of the following operations [16S02]

- a. union
- b. intersection
- c. complementation
- d. not union**

158. Universal language is [16S03]

- a. recursively enumerable
- b. non recursively enumerable

c. decidable

d. recursive

159. The union of two recursively enumerable languages is [16S04]

a. recursive

b. not recursively enumerable

c. recursively enumerable

d. not recursive

160. Let L be a language which is not recursively enumerable .Then complement of L must be [16S05]

a. recursive

b. recursively enumerable

c. not recursive

d. not recursively enumerable

161. Which of the following subset relation does n't hold ? [17D01]

a. L_r is subset or $= L_{cf}$

b. L_{cf} is subset or $= L_{cs}$

c. L_{cs} is subset or $= L_0$

d. L_0 is subset or $= L_r$

162. Find the odd man out [17D02]

a. The hating problem of TM

b. state entry problem

c. Blank tape halting problem

d. post correspondence problem

163. The problem of determining that a TM would halt after giving a yes /no output is [17M01]

a. unsolvable

b. solvable

c. decidable

d. solvable or decidable

164. Select the false statement [17M02]

a. The TM halting problem is undecidable

b. The TM halting problem is decidable

c. The blank tape halting problem is undecidable

d. The TM halting problem is decidable or undecidable

165. Decidability in decidable and undecidable problem refers to [17M03]

a. unsolvability

b. existence of algorithm which generates the set of solutions

c. existence of algorithm which takes an instance of the problem and determines whether the answer to

that instance is yes or no

d. Those problems whose answers are only either in yes or no

166. What can you say about the membership problem for Type 0 grammars ? [17S01]

a. decidable

b. undecidable

c. partially decidable

d. can't say

167. Let G be any unrestricted grammar .Then the problem of determining whether or not $L(G)=\Phi$ is [17S02]

a. decidable

b. undecidable

c. partially decidable

d. can't say

168. It is decidable whether a given right linear grammar $G = \{N, T, S, P\}$ contains any useless non terminals [17S03]

a. True

b. False

c. true or false

d. can't say

169. It is decidable whether $L(G)=\Phi$ where G is any CFG ? [17S04]

a. True

b. False

c. true or false

d. can't say

170. It is decidable whether $L(G)$ is infinite where G is any CFG ? [17S05]

a. True

b. False

c. true or false

d. can't say

171. Which of the following statement is false ? [18D01]

- a. PCP with two lists $x = \{b, bab^3, ba\}$ and $y = \{b^3, ba, a\}$ has no solution
- b. PCP with two lists $x = \{01, 1, 1\}$ and $y = \{01^2, 10, 1^2\}$ has no solution
- c. PCP over Σ for $|\Sigma| \geq 2$ is unsolvable
- d. PCP over Σ for $|\Sigma| \geq 2$ is solvable

172. Which of the following statement is true ? [18D02]

- a. PCP with two lists $x = \{b, bab^3, ba\}$ and $y = \{b^3, ba, a\}$ has no solution
- b. PCP with two lists $x = \{01, 1, 1\}$ and $y = \{01^2, 10, 1^2\}$ has no solution
- c. PCP over Σ for $|\Sigma| \geq 2$ is unsolvable
- d. PCP over Σ for $|\Sigma| \geq 2$ is solvable

173. Which of the following instances of the Post Correspondence Problem have a Viable sequence?

- i) $\{(ab, abb), (ba, aaa), (aa, a)\}$
- ii) $\{(ab, aba), (baa, aa), (aba, baa)\}$
- iii) $\{(b, bb), (bb, bab), (bab, abb), (abb, babb)\}$ [18M01]

- a. 1 only
- b. 2 only
- c. 1 and 2 only
- d. 1, 2, and 3

174. PCP is decidable for two set of strings w and v if [18M02]

- a. Corresponding strings in w and v are of equal length
- b. The strings consist of just one character repeated any no of times i.e., input symbol set is a singleton
- c. Corresponding strings in w and v are of not equal length
- d. It is never decidable

175. MPCP stands for _____ [18M03]

- a. modified posts correspondence problem
- b. many posts correspondence problem
- c. most posts correspondence problem
- d. merged posts correspondence problem

176. If 2 Lists are $x = \{b, bab^3, ba\}$ and $y = \{b^3, ba\}$, a(a) then solution of PCP problem is [18S01]

- a. 2 1 1 1 3
- b. 2 1 1 3
- c. 2 3 3 3
- d. 1 2 3 3

177. For PCP and MPCP [18S02]

- a. if there exists PCP solution then there is a MPCP solution
- b. if there exists MPCP solution then there is a PCP solution
- c. Both are equivalent
- d. Both are unrelated

178. PCP is [18S03]

- a. Decidable
- b. Undecidable
- c. Sometimes undecidable
- d. sometimes decidable

179. If PCP is decidable then MPCP is _____ [18S04]

- a. decidable
- b. undecidable
- c. can't say
- d. some times decidable

180. 'MPCP is undecidable problem' is _____ [18S05]

- a. True
- b. False
- c. true or false
- d. can't say

181. The problem of determining whether or not a TM over $[0, 1]$ will ever print the symbol 1 with a given tape configuration is [19D01]

- a. solvable
- b. unsolvable
- c. solvable or unsolvable
- d. can't say

182. What can you say about the membership problem for Type 0 grammars ? [19D02]

- a. decidable
- b. undecidable
- c. partially decidable

d. can't say

183. The class of context free languages are contained in [19M01]

- a. $DTIME(n)$
- b. $DTIME(n^*n)$
- c. $DTIME(n^*n^*n)$**
- d. $DTIME(n^*n^*n^*n)$

184. A language L_1 is polynomially reducible to L_2 if L_2 is in NP then [19M02]

- a. L_1 is in P
- b. L_1 is in NP**
- c. L_1 is NP hard
- d. L_1 is in coNP

185. Inherent ambiguity for CFL is [19M03]

- a. decidable**
- b. undecidable
- c. partially decidable
- d. can't say

186. Intractable problems are those which [19S01]

- a. are not solvable
- b. which are not in NP
- c. which are not in P**
- d. which are in coNP

187. Which of the following holds [19S02]

- a. P is not in NP
- b. NP is not in PSPACE
- c. P is not in PSPACE
- d. P is in NP**

188. Given a TM T and word w it is undecidable " whether T halts when the string w is placed on the input tape ?"

[19S03]

- a. True**
- b. False
- c. True or False
- d. can't say

189. Given a type 0 grammar G and a word w ,it is undecidable " whether G generates w?"

[19S04]

- a. True**
- b. False
- c. True or False
- d. can't say

190. Given an arbitrary TM T it is undecidable " whether T accepts the empty word λ ?" [19S05]

- a. True**
- b. False
- c. True or False
- d. can't say

191. If $NP \neq coNP$ then [20D01]

- a. $NP = P$
- b. $NP \neq P$**
- c. $P \neq coNP$
- d. $P = coNP$

192. Let L be an NP-complete problem .Then $P = NP$ if [20D02]

- a. SAT is reducible to L
- b. L is in P**
- c. L is polynomially reducible to some NP-complete problem
- d. L is in coNP

193. A class of problems called _____ if there is solution of one decision problem from that family then

there will be solution for each and every decision problem from that family [20M01]

- a. P
- b. NP
- c. P-complete
- d. NP-complete**

194. What version of a problem is used to determine if it is NP hard [20M02]

- a. optimal solution problem
- b. worst case solution
- c. decision problem**
- d. optimal value problem

195. A problem L is NP complete if [20M03]

- a. L is NP hard
- b. L is in NP
- c. SAT is reducible to L and L is in NP**
- d. L is in coNP

196. A problem is NP hard if [20S01]

- a. It is hard to implement**
- b. It can be verified in polynomial time by a deterministic machine
- c. Every problem in NP is transformable to it in polynomial time
- d. It can not be solved in exponential time

197. If $P=NP$ then [20S02]

- a. Every problem in NP can be solved in polynomial time
- b. No problem can be solved in polynomial time

c. SAT can not be solved in polynomial time

- d. It is unknown what would happen

198. The family of languages belonging to NP is closed under which of the following operations [20S03]

- a. union
- b. intersection
- c. complementation

d. union ,intersection ,complementation

199. Which of the following is not NP complete [20S04]

- a. 3-coloring problem
- b. traveling salesman problem
- c. knapsack problem

d. 2-SAT problem

200. A NP hard problem is a problem [20S05]

- a. which is harder than NP problem
- b. which is not in P
- c. to which all the NP problems are polynomially reducible**
- d. which is in P