- The size of an object in the projection is ... to its size in the scene.
- There is no foreshortening, but there can be perspective distortion if the angle of ... projection is not perpendicular to the viewing direction.
- An example of a parallel projection would be an isometric or axonometric view of ... object in a video game, where the sizes of the objects are not proportional to their ... sizes, but the parallel lines appear parallel in the projection.

Perspective Projection: In a perspective projection, the image is projected onto a plane ... angle that is not perpendicular to the viewing direction. This type of projection is use... create a sense of depth and realism in computer graphics and virtual reality applica...
Some key concepts include:

- Objects that are farther away from the viewer appear smaller in the projection.
- Parallel lines that are not parallel to the viewing direction appear to converge ... vanishing point in the projection.
- There is foreshortening and perspective distortion in the projection.

MULTIPLE CHOICE QUESTIONS

Theory of Computation

1. **Let R_1 and R_2 be regular sets defined over alphabet $\sum$ then**
   A. $R_1 \cup R_2$ is regular
   B. $\sum \cap R_2$ is not regular
   C. $R_1 \cap R_2$ is not regular
   D. R_2^* is not regular

2. **Consider the production of the grammar**
   $S \rightarrow AA$
   $A \rightarrow aa$
   $A \rightarrow bb$
   Describe the language specified by the production grammar
   A. L = {aaaa, aabb, bbaa, bbbb}
   B. L = {abab, abaa, aaab, baaa}
   C. L = {aaab, baba, bbaa, bbbb}
   D. L = {aaaa, ababa, bbaa, aaab}

3. **Give a production grammar that specified language**
   $L = \{a^i\, b^{2i} / i \geq 1\}$
   A. {S → aSbb, S → abb}
   B. {S → aA, S → b, A → b}
   C. {S → aSb, S → b
   D. None of the above

4. **Which of the following string can be obtained by the language**
   $L = \{a^i b^{2i} / i \geq 1\}$
   A. Aaabbbbbb
   B. Abbabbba
   C. aabb
   D. aaaabbbabb

5. **Give a production grammar for the lanaguae L ={x/x ∈ (a, b)*, the number of a's in x is multiple of 3}**
   A. {S → bS, S → b, S → aA, S → bA. A → aB, B → bB, B → aS, S → a}
   B. {S →aS, S → bA, A → bB, B → bBa, B → bB}
   C. {S → aaS, S → bbA, A →bB, B → ba}
   D. None of the above

6. **Let L1 = $\{a^i b^j / i > j\}$ and L2 = $\{a^i b^j / i < j\}$. the union of L1 and L2 is given by**
   A. $\{a^i b^j / i, > j \geq 1\}$
   B. $a^i b^j / i > j \geq 1\}$
   C. $\{a^i b^j / i, j \geq 1\}$
   D. $\{a^i b^j / i, j \geq 1, i \neq j\}$

7. **Give a production grammar for the language**
   $L = \{a^i b^j / I, j \geq 1, i \neq j\}$
   A. {S → aS, S → aB, B → ab, A →aaB, B → b}
   B. {S → A, S → C, A → aA A → aB, B → aBb, B → ab, C → Cb, ∈ → Bb}
   C. {S → A, A → aA, A → aB, B → ab}
   D. None of the above

8. **The production grammar is {S → aSbb, S → abb} is**
   A. Type-3 grammar
   B. Type-1 grammar
   C. Type-3 grammar
   D. Type-0 grammar

9. **Which of the following statement is wrong?**
   A. A Turing machine cannot solve halting problem
   B. Set of recursively enumerable languages is closed under union
   C. A finite State Machine with 2 stacks
   D. Context sensitive grammar can be recognized by a linearly bounded memory machine

10. **Which of the following statement is wrong?**
   A. Recursive language are closed under union
   B. Recursive language are closed under union
   C. If a language and its. Complement are both regular, then the language must be recursive
   D. A language is accepted by FA if and only if it is recursive

11. **Which of the following statement is wrong?**
   A. Every recursive language is recursively enumerable
   B. A language is accepted by FA if and only if it is context free
   C. Recursive languages are closed under intersection
   D. A language is accepted by a FA if and only if it is right linear

12. **Which of the following statement is true?**
   A. All language can be generated by CFG
   B. The number of symbols unnecessary to simulate a Turing Machine (TM) with m symbols and n states is mn
   C. Any regular language has an equivalent CFG
   D. The class of CFG is not closed under union

13. **Recursively enumerable languages are not closed under**
   A. Complementation
   B. Intersection
   C. Union
   D. None of the above

14. **Regular expression (x/y) denotes the set**
   A. {xy, xy}
   B. {x,y}
   C. {xx,xy,yx,yy}
   D. {x,y,xy}

15. **Regular expression x/y dented the set**
   A. {x,y}
   B. {xy}
   C. {x}
   D. {y}

16. **The regular expressions denote a language comprising all possible strings of even length over the alphabet (0,1)**
   A. $1 + 0 (1 + 0)^*$
   B. $(1 + 0)$
   C. $(0 + 1) (1 + 0)^*$
   D. $(00 + 011 + 10)^*$

17. **The regular expressions denote zero or more instances of an x or y is**
   A. $(x + y)$
   B. $(x^* + y)$
   C. $(x + y)^*$
   D. $(xy)^*$

18. **The regular expression has all strings in which any number of 0's is followed by any number of 1's followed by any number of 2's is:**
   A. $(0 + 1 + 2)^*$
   B. $0^* + 1 + 2$
   C. $0^*1^*2^*$
   D. $(0 + 1)^*2^*$

19. **The regular expression have all strings of 0's and 1's with no two consecutive 0's, is**
   A. $(0 + 1)$
   B. $(0 + \in) (1 + 10)^*$
   C. $(0 + 1)^*$
   D. $(0 + 1)^* 011$

20. **The regular expression with all strings of 0's and 1's with at least two consecutive 0's is:**
   A. $1 + (10)^*$
   B. $(0 + 1)^*011$
   C. $(0 + 1)^*00(0 + 1)^*$
   D. 0^*1^*2

21. **Which of the following is NOT the set of regular expression R = (ab +abb)* bbab**
   A. Ababbbbab
   B. Ababbabbbab
   C. Abbbab
   D. Abababab

22. **Which string can be generated by** $S \rightarrow aS/bA, A \rightarrow d/cA$
   A. Aabccd
   B. Abcca
   C. Adabcca
   D. Abababd

23. **The regular sets are closed under**
   A. Union
   B. Kleene's closure
   C. Concentration
   D. All of the above

24. **Which of the following statement(s) is (are) wrong?**
   A. The regular sets are closed under intersection
   B. The class of regular sets is closed under substitution
   C. The class of regular sets is closed under homomorphisms
   D. Context sensitive Grammar (CGS) can be recognized by Finite State Machine

25. **A Finite State Machine can be considered, having finite tape length without rewinding capability and unidirectional tape movement**
   A. Turing machine
   B. Context free languages
   C. Pushdown automata
   D. Regular language

26. **Which of the following statement is wrong?**
   A. A finite state machine can be considered to be a Turing Machine of finite tape length without rewinding capability and unidirectional tape movement
   B. Turing machine is more powerful than finite state machine because it has the capability to remember arbitrary long sequences of input symbol
   C. Palindromes can't be recognized by any Finite State Machine (FSM) because an FSM can't remember arbitrarily large amount of information
   D. Turing machine is more powerful than. FMS because it has no final state

27. **Let L be a Language recognizable by Finite automation. The Language REVERSE L' = {ω/ω is the reverse of v where v ∈ L} is**
   A. Regular language
   B. Context-free language
   C. Context-sensitive language
   D. Recursively enumerable language

28. **The Grammar G = <{S}, {0, 1}, P, S>** Where p is S → 0SI, S → 0S, S → SI, S →0 is
   A. Recursively enumerable language
   B. Regular expression
   C. Context-sensitive language
   D. Context free language

29. **Any given transition graph has an equivalent**
   A. Regular expression
   B. DFSM (Deterministic Finite State Machine)
   C. NDFSM
   D. All of them

30. **The intersection of CFL and regular language**
A. Is always regular
B. Both (A) and (C) above
C. Is always context-free
D. Need not be regular

31. **Context-sensitive Grammar can be recognized by**
A. Deterministic pushdown Automata
B. Non-deterministic pushdown automata
C. Finite State Machine (FSM)
D. Linearly Bounded Memory Machine

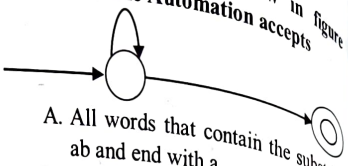
32. **Which of the following regular expression identity's are true?**
A. $(r^*)^* = r^*$ B. $r^*S^* = r^* + S^*$
C. $(r+S)^* = r^* + S^*$ D. All of these

33. **The Language L = {0"1n2k3k where n, k > 0}**
A. Context-sensitive language
B. Context-free language
C. Regular languages
D. Recursively enumerable language

34. **Consider the production grammar**
S → XY/XS
X → a/aX
Y → b
Which of the following regular expressions corresponding to the production grammar?
A. $(ab)^*$ B. $a(ab)^{*b}$
C. aa^*b^* D. aa^*b

35. **Which of the following sentences is generated by production grammar?**
S → aSbX
X → dccX
A. Abbbd B. aabccd
C. aabd D. ababccd

36. **Consider a NDFA show in figure below. The Automation accepts**



A. All words that contain the substring ab and end with a
B. All words that contain the substring ba and end with a
C. All words that end with a, but not the null string ∈
D. All words that end with a, and also the null string

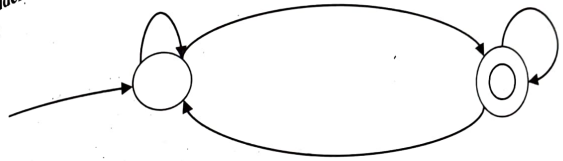
37. **Which of the following is accepted by deterministic pushdown machine but not accepted by non-deterministic pushdown machine (NDPDM)?**
A. Strings end with a particular alphabet
B. All strings in which a given symbol is present at least twice
C. Even palindrome
D. None of these

38. **Consider the following grammar**
X → Xx/Yy
X → Yy/Zω
Y → χ/Yw
Z χ→ y
Which of the regular expressions describe the same set of strings as the grammar?
A. $\chi\omega^*y + x\omega^*yx + y\omega x$
B. $x\omega^y + x\omega^*xy + y\omega x$
C. $x\omega^*y + x\omega xyx + y\omega x + y\omega x$
D. $x\omega xy + x\omega\omega^*y + y\omega x$

39. **Which of the following instance of the post correspondence problem have a viable sequence?**
A. {(x, xx), (xx, xyx), (xyx, yxx), (yxx, xyxx)
B. {(yx, yxy), (xyy, yy), (yxy,xyy)
C. {(yx, yxx), (xy, yyy), (yy, y)}
D. None of the above

40. **Which of the following statement(s) is (are) correct?**
A. Recursively languages are closed under complementation
B. If a language and its complement are both recursively enumerable then language is recursive
C. Set of recursively enumerable language is closed under union
D. All of these

41. **Consider the following FA shown in figure below. The language accepted by the FA is**



A. $(a+b)^*b$ B. $(a+b)^*b$
C. a^*b D. a^*b^*

42. **Which of the following statement is wrong**
A. Any regular language has an equivalent context-free grammar
B. Some non-regular languages can't be generated by any context-free grammar
C. The intersection of context free languages and a regular language is always context-free
D. All language can be generated by CFG

43. **Consider a grammar**
S → SS
S → 0S1
S → 1S0
S → ∈
The grammar will generate
A. Regular language
B. Context-free language
C. Context sensitive language
D. Recursively enumerable language

44. **The language constructs which are useful in describing nested structures such as balanced parenthesis**
A. Regular expression
B. Non-context free grammars
C. Context-free grammar
D. None of these

45. **A grammar that produce more than one parse free for same sentence is called**
A. Ambiguous B. Regular
C. Unambiguous D. None of these

46. **Which of the regular expression denotes a language containing all possible strings over the alphabet {a, b}?**
A. a^*b^* B. $(a, b)^*$
C. $(ab)^*$ D. $(a+b^*)$

47. **Palindromes can't be recognized by any Finite State Machine because**
A. An FSM can't remember arbitrarily large amount of information
B. An FSM can't fix the mid-point
C. FSM can't find whether the second half of the string matches the first half
D. All of these

48. **A language L is accepted by FA if and only if it is**
A. Context-free
B. Recursive
C. Context sensitive
D. Right-linear

49. **A language is denoted by a regular expression L = {x*(x/yx). Which of the following is not a legal string within L?**
A. Yx
B. yxx
C. x
D. xy xyx

50. **Can a DFA simulate NFA?**
A. No
B. Sometimes
C. Yes
D. Depends on NFA

51. **Let L be set of strings from alphabet. The Kleen closure of L is given as**
A. $L^+ = U_{i=0} L^i$ B. $L^+ = U_{i=1} L^i$
C. $L^* = U_{i=0} L^i$ D. $L^+ = U_{i=1} L^i$

52. **If a source language supports some macro pre-processor functions then these functions can be implemented in**
A. Lexical analysis phase
B. Code generation
C. Parsing
D. Syntax analysis phase

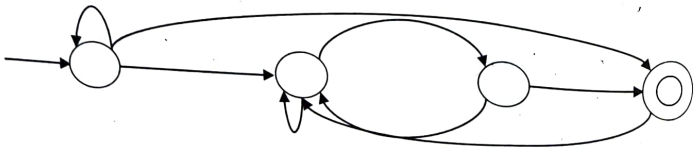
53. **If e1 and e2 are the regular expressions denoting the language L_1 and L2 respectively, then which of the following is wrong?**
A. $(e_1) + (e_2)$ is regular expression denoting $L_1 U L_2$
B. $E_2 E_3$ regular expression denoting $L_1 . L_2$
C. Ø is not regular expression
D. $\{e_1\}^*$ is regular expression denoting L^*_1.

54. **The regular expression (a + b)* denotes all strings.**
A. With zero or more instances of a and b both simultaneously
B. With one or more instances of a and b
C. Equal to regular expression $(a^* + b^*)^*$
D. Any combination of a's and b's including null string

55. **Every CFG can be transferred into equivalent**
A. Greiback normal form
B. Either (a) or (b)
C. CNF
D. All of the above

56. **Consider the following regular expression**
R = (ab + abb)* bbab
Which of the following is not in R?
A. Ababab B. Abbab
C. Ababbabbbab D. Abbabbbab

57. **In the figure shown, a DFA m has start state A and accepting state D. Which of the following regular expression denoted the set of all words accepted by m?**



A. 001 B. $(0 + 1)^*011$
C. $10^* 1^* 0$ D. $1^* 0^* 001$

58. **Which of the following is most general phase-structured grammar?**
A. Regular
B. Context-free
C. Context-sensitive
D. None of these

59. **Context-free grammar can be recognized by**
A. Finite state automation
B. 2-way linear bounded automata
C. Push down automata
D. Both (B) and (C) above

60. **Context sensitive grammar (CSG) can be recognized by**
A. Finite state automata
B. Push down automata
C. 2-way linear bounded automata
D. None of these

61. **Consider the grammar G, where the productions are numbered as shown**
1) E → E + T
2) E → T
3) T → T * F
4) T → F
5) F → ∈
6) F → a

If a shift-reduce (bottom-up) parser writes the production number used immediately after performing any reduction, what will be printed if the parser input is $a + a^* a$?
A. 62461 B. 6262441
C. 64642331 D. 64264631

62. **Which sentence can be generated by**
S → As/bA
A → d/ccA
A. Bccddd B. abbbd
C. aabccd D. ababccd

63. **Which of the following recognizes variables prefixes of the grammar?**
A. DFA
B. NFA
C. Both errors can be detected
D. None of these

64. **Dynamic errors can be detected**
A. Only at compile time
B. Only at run time
C. Both at compile time and at run time
D. None of these

65. **Compiler is a software which converts**
A. High level language program into low level language program
B. Source program into object program
C. Program in high level language into program in low level language
D. Program in source language into program in object language

66. **The language L = $\{a^n b^m c^n b^m / n \geq 1, m \geq 1\}$.**
A. Is a context free
B. Both (a) and (b)
C. Is not context free
D. None of these

67. **The language L = {0n 1n 2n where n > 0} is a**
A. CFL
B. Context-sensitive language
C. Regular language
D. Recursive enumerable language

68. **Which of the choice in an operator grammar equivalent for**
S → SAS/a
A → bSb/b
Assume S is start symbol
A. S → SAS/a, A → bSb/b
B. S → SbAbS/a, A → b
C. S → SbSbS/SbS/a
D. S → SbS/b

69. Let S and T be language over $\sum = \{a, b\}$ represent by regular expression $(a + b^*)^*$ and $(a + b)^*$ respectively then
A. SCT B. TCS
C. S = T D. $S \cap T = \emptyset$

70. Let L denote the language generated by the grammar $S \rightarrow 0S0100$ then
A. $L = 0^+$
B. L is regular but not 0^+
C. L is context free but not regular
D. L is not context free

71. Consider the regular expression (0 +1) (0 + 1)*.....n times. The minimum state finite automation that recognizes the language represented by this regular expression contains
A. n states B. n + 2 states
C. n +1 states D. None of these

72. A grammar that is both left and right recursive for non-terminal is
A. Ambiguous
B. Information is not sufficient
C. Unambiguous
D. None of these

73. If the regular set A is represented by A = (01 + 1)* and the regular set 'B' represented by B = [(01)* 1*] then
A. A ⊂ B
B. A and B are uncomparable
C. B ⊂ A
D. A = B

74. Which of the following can be recognized by a DFA
A. The number 1, 2, 4 .....z^n..... written in binary
B. The number 1, 2, 4, ...z^n..... written in un binary
C. The set of binary strings in which the number of zeros is the same as the number of ones
D. The set {1, 101, 11011, 1110111 ...}

75. The string 1101 does not belong to the set represented by
A. $110^* (0 + 1)$
B. $(10)^* (01)^* (00 + 11)^*$
C. $1(0 + 1)^* 101$
D. $[00 + (11)^* 0]^*$

76. Regarding the power of recognition of language, which of the following statements is false?
A. The NDFA is equivalent to DFA
B. NPDA is equivalent to DPDA
C. Non-deterministic Turing machines are equivalent to deterministic push-down automata
D. Multi-tape Turing-machine are equivalent to Single-Tape Turing machine

77. Let * be defined as $a * b = \bar{a} + y$. Let $c = a * b$; value of $c * a$ is
A. $\bar{a} + b$ B. a
C. 0 D. 1

78. Which one of the following regular expressions over {0, 1} denotes the set of all string not containing 100 as a substring?
A. $0^* (1 + 0)^*$ B. $^*1^*01$
C. $0^* 1010^*$ D. $0^* (10 + 1)^*$

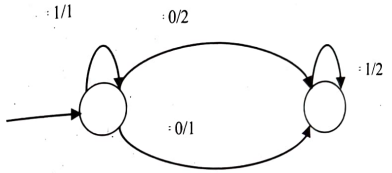
79. Which of the following languages over {a, b, c} is accepted by deterministic push down automata?
A. $\{\omega \subset \omega^R / \omega \in (a, b)^*\}$
B. $\{\omega\omega^R / \omega \in \{a, b, c\}^*\}$
C. $\{a^n b^n c^n / n \geq 0\}$
D. $\{\omega / \omega$ is palindrome {a, b, c}

80. Two of following four regular expressions are equivalent, which two?
i. $(00)^* (\in + 0)$
ii. $(00)^*$
iii. 0^*
iv. $0(00)^*$
A. (i) and (ii) B. (i) and (iii)
C. (ii) and (iii) D. (iii) and (iv)

81. Let $L \subseteq \sum^*$ where $\sum = \{a, b\}$: which of the following is true?
A. L = {x/x has an equal number of a's and b's} is regular
B. $L = \{a^n b^n / n \geq 1\}$ is regular
C. L = {x/x has more a's than b's} is regular
D. $L = \{a^m b^n / m \geq 1\}$ is regular

82. Let R1 and R2 be regular sets defined over the alphabet $\sum 1$ then
A. $R_1 \cap R_2$ is not regular
B. $\sum^* - R_1$ is regular
C. $R_1 \cap R_2$ is regular
D. R^*_1 is not regular

83. If the state machine shown in the figure should have a stable state the restrictions on the input is given by



A. a . b = 1 B. a + b = 1
C. $\bar{a} + \bar{b} = 0$ D. a . b = 1

84. In order to make the automation in operator precedence, these are the segments of bigger grammars so don't worry about completeness
A. $E \rightarrow E + T/T\ T \rightarrow E$
B. $E \rightarrow E + E$
C. $E \rightarrow T\ \ T \rightarrow T + T/E$
D. $E \rightarrow E + T/T\ \ T \rightarrow E/id$

85. The productions $E \rightarrow E + E, E \rightarrow E - E, E \rightarrow E * E, E \rightarrow E/E, E \rightarrow id$
A. Generate an inherently ambiguous grammar
B. Generate an ambiguous grammar but not inherently so
C. Are unambiguous
D. Can generate all possible fixed length valid computation for carrying out addition, subtraction multiplication and division which can be expressed in one expression

86. The hierarchical relationship among context-free, right-linear and context-sensitive language is given by
A. Context-free ⊂ right-linear ⊂ context-sensitive
B. Context-free ⊂ context sensitive ⊂ right-linear
C. Context-sensitive ⊂ right-linear ⊂ context-free
D. Right-linear ⊂ context-free ⊂ context-sensitive

87. Can a DFA simulate NFA?
A. No
B. Sometimes
C. Yes
D. Depends on NFA

88. **The major difference between a more and mealy machine is that**

A. The output of the former depends only on the present state and present input

B. The output of the former depends only on the present state

C. The output of the former depends only on the present input

D. All of these

89. **Finite state machine can recognize**

A. Any grammar

B. Any unambiguous grammar

C. Only CG

D. Only regular grammar

90. **Pumping Lemma is generally used for proving**

A. A given grammar is regular

B. A given grammar is not regular

C. Whether two given regular expressions are equivalent or not

D. None of these

91. **Which of the following is not regular?**

A. String of 0's whose length is a perfect square

B. Set of all palindrome made up of 0's and 1's

C. Set of all 0's whose length is prime

D. All of these

92. **Choose the correct statements**

A. A = $\{a^n b^n / n = 0, 1, 2, 3, \ldots.\}$ is regular language

B. The set B of all strings of equal number of a's and b's defines a regular language

C. $L(A^*B^*) \cap B$ gives the set A.

D. None of these

93. **The basic limitations of finite state machine is that**

A. It cannot remember arbitrary large amount of information

B. It cannot recognize grammars are regular

C. It sometimes recognize grammars are not regular

D. All of these

94. **Palindrome cannot be recognized by any FSM because**

A. An FSM can't remember arbitrary information

B. An FSM can't deterministically fix the mid point

C. Both (A) and (B)

D. None of these

95. **An FSM can be considered to be a TM (Turing machine)**

A. Of finite tape length, rewinding capability and unidirectional tape movement

B. Of finite tape length, without rewinding and unidirectional tape movement

C. Of finite tape length, rewinding capability and bidirectional tape movement

D. All of these

96. **Turing machine is more powerful than FSM because**

A. Tape movement is confined to one direction

B. It has no finite state control

C. It has the capability to remember arbitrary long sequence of input symbols

D. None of these

97. **For given picture the FSM recognizes**

A. All strings B. $\in$ –alone

C. No strings D. None of these

98. **In given picture, the FSM represents**

A. Mealy machine B. Kleen machine

C. Moore machine D. All of these

99. **The language of all words with atleast 2a's can be described by the regular expression:**

A. (ab)*a and a(ba)*

B. b*ab*a(a + b)*

C. (a + b)*ab*a (a + b)*

D. All of these

100. **Which of the following pairs of regular expressions are not equivalent?**

A. (ab)*a and a(ba)*

B. b*ab*a (a + b)*

C. (a + b)* ab*a (a+ b)*

D. All of these

101. **Any given transition graph has an equivalent**

A. Regular expression

B. NDFSM

C. DFSM

D. All of these

102. **The following CFG**

S → aS/bS/a/b is equivalent to regular expression

A. (a + b) B. (a + b) (a +b)

C. (a +b) (a +b) D. All of these

103. **Any string of terminals that can be generated by the following CFG is**

S → XY

X → ax/bx/a

Y → Ya/Yb/a

A. Has atleast one 'b'

B. Has no consecutive a's or b's

C. Should end n a 'a'

D. Has atleast two a's

104. **The following CFG**

S → aB/Ba

A → b/aS/Baa

B → a/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 of b's

C. Even number of a's and even number of a's

D. Odd number of a's and even number of a's

105. **The set $\{a^n b^n / n = 1, 2, 3, \ldots\}$ can be generated by the CFG**

A. S → ab/aSb

B. S → ab/aSb/$\in$

C. S → aaSbb/ab

D. None of these

106. **Choose the correct statement**

A. All language can be generated CFG

B. Any regular language has an equivalent CFG

C. Some non-regular languages can't be generated by an CFG

D. Some regular language can't be simulated by an FSM

107. **Which of the following CFG's can't be simulated by an FSM?**

A. S → Sa/a

B. S → abX, X → cY, Y → a/aX

C. S → aSb/ab

D. None of these

108. **The set $A = \{a^n b^n c^n / n = 1, 2, 3, \ldots\}$ is an example of**

A. Regular language

B. Non context free language

C. Context free language

D. None of these

109. The intersection of CFL and a regular language
A. Need not be regular
B. Is always regular
C. Need not be context free
D. None of these

110. Choose the correct statements:
A. The power of DFSM and NDFSM are same.
B. The power of DFSM and NDFSM are different.
C. The power of DPDM and NDPDM are different.
D. Both (A) and (C) above.

111. Which of the following is accepted by an NDPDM but not by a DPDM?
A. All strings in which a given symbol is present at least twice
B. Even palindromes.
C. Strings ending with a particular alphabet.
D. None of these.

112. Bounded minimization is a technique for
A. Proving whether a promotive recursive function is Turing computable or not.
B. Providing whether a primitive recursive function is a total function or not.
C. Generating primitive recursive functions.
D. Generating partial recursive functions.

113. Universal Turing machine influenced the concept of
A. Stored program computers
B. Interpretive implementation of programming language
C. Computability
D. All of these

114. The statement " A Turing machine can't solve halting problem" is
A. True
B. Still at open question
C. False
D. All of these

115. If there exists a TM which when applied to any problem in the class, terminates, if the correct answer is yes and may or may not terminate otherwise is said to be
A. Stable
B. Partially solvable
C. Unstable
D. Unstable

116. The vernacular language English, if considered a formal language is a
A. Regular language
B. Context sensitive language
C. Context free language
D. None of these

117. P, Q, R are three languages, if P and R are regular and if PQ = R then
A. Q = R
B. Both A and B
C. Q= P
D. None of these

118. Consider the grammar
S → PQ/SQ/PS
P → X,
Q → Y
To get string of n terminals, the number of productions to be used is
A. N
B. n + 1
C. 2^n
D. 2^{n-1}

119. The following grammar
S → aab/bac/ab
S → abb/ab
S → aS/b
B → bab/b
A. CFG
B. Context sensitive
C. Regular
D. None of these

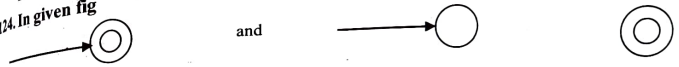
120. Let A = {0,1} and L = A^*. Let R = $\{0^n1, n > 0\}$ then the language L U R and R are respectively.
A. Regular, regular
B. Regular, not regular
C. Not regular, regular
D. Not regular, not regular

121. Which of the following is not possible algorithmically?
A. Regular grammar to context free grammar
B. Non-deterministic finite state Automata to deterministic FSA
C. Non-deterministic PDA to deterministic PDA
D. None of these

122. As FSM can be used to add two given integers. That is
A. True
B. False
C. May be true
D. None of these

123. A grammar is said to be in CNF, if all the productions are of the form A → BC or A → a. Let G be a CFG in CNF. To derive a string of terminals of length x, the number of production to be used is
A. 2x -1
B. 2x
C. 2x + 1
D. 2^x

124. In given fig



A. Both are equivalent
B. The first FSM accepts nothing
C. The second FSM accepts ∈-only
D. None of these

125. The number of tokens in the Fortran statement DO 10 I = 1.25 is
A. 3
B. 4
C. 5
D. None of these

126. The word 'formal' in formal languages means
A. The symbols used have well-defined language meaning
B. They are unnecessary in reality
C. Only the form of the string of symbols is significant
D. None of these

127. If A = {0, 1}, the number of possible strings of length 'n' is
A. n!
B. n × n
C. n^n
D. 2^n

128. A mealy machine
A. May be machine
B. Has an equivalent more
C. Only context-free grammar
D. All of these

129. The recognizing capability of NDFSM and DFSM
A. May be different
B. Must be same
C. Must be different
D. None of these

130. 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

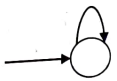
131. Which of the following pairs of regular expressions are equivalent?

A. $1(01)^*$ and $(10)^*$
B. $y+$ and y^*y+
C. $Y(yy)^*$ and $(yy)^*y$
D. All of these

132. The logic of pumping Lemma is a good example of

A. The pigeon-hole principle
B. The divide and conquer technique
C. Recursion
D. Iteration

133. The FSM pictured shown in the figure



A. Mealy machine B. Kleene machine
C. Moore machine D. None of these

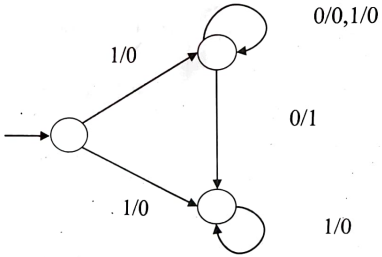
134. The above machine

A. Complements a given bit pattern B. Generates all strings of 0's and 1's
C. Adds 1 to a given bit pattern D. None of these

135. The language of all words with at least 2a's can be described by the regular expression

A. $(a+b)^*a(a+b)^*a(a+b)^*$ B. $b^*ab^*a(a+b)$
C. $(a+b)^*ab^*a(a+b)^*$D. All of these

136. For the following figure



A. Complements a given bit pattern B. Finds 2's complement of a given bit pattern
C. Increment a given bit pattern by 1 D. Change the sign bit

137. For which of the following applications regular expression can't be used?

A. Designing compilers
B. Simulating sequential circuits
C. Developing text editors
D. All of these

138. The following CFG

$S \rightarrow xS/yS/x/y$

Is equivalent to the regular expression

A. $(x+y)^*$ B. $(x+y)^*(x+y)$
C. $(x+y)(x+y)^*$ D. All of these

139. Any string of terminals that can be generated by the following CFG

$S \rightarrow AB$
$A \rightarrow aA/bB/a$
$B \rightarrow Ba/Bb/a$

A. Has at least one b
B. Has no consecutive a's or b's
C. Should end in an 'a'
D. Has at least two a's

140. The following CFG

$S \rightarrow aB/bA$
$A \rightarrow b/aS/bAA$
$B \rightarrow b/bs/aBB$

Generates strings of terminals that have

A. Equal number of a's and b's
B. Odd number of a's and odd number of b's
C. Ever number of a's and number of b's
D. Odd number a's and een number of a's

141. The set $\{a^nb^n/n = 1, 2, \ldots\}$ can be generated by a CFG

A. $S \rightarrow ab/aSb$
B. $S \rightarrow ab/aSb/\in$
C. $S \rightarrow aSbb/ab$
D. $S \rightarrow aSbb/ab/aabb$

142. Which of the following CFG's can't be simulated by an FSM?

A. $S \rightarrow Sa/a$
B. $S \rightarrow a/X$, $X \rightarrow cY$, $Y \rightarrow -d/aX$
C. $S \rightarrow aSb/ab$
D. None of these

143. CFG is not closed under

A. +Union
B. Complementation's
C. Kleene star
D. Product

144. The set $A = \{a^nb^na^n/n = 1, 2, 3, \ldots\}$ is an example of a grammar that is

A. Regular
B. Not context free
C. Context-free
D. None of these

145. Let

$L_1 = \{a^nb^na^m/n, m = 1, 2, 3, \ldots\}$
$L_2 = \{a^nb^ma^m/n, m = 1, 2, 3, \ldots\}$
$L_3 = \{a^nb^n\ a^n/n = 1, 2, 3, \ldots\}$

Of the following the correct answer is

A. $L_3 = L_1 \cap L_2$
B. L_1 and L_2 are not CFL, but L_3 is CFL
C. L_1 is a subset of L_3
D. None of these

146. The intersection of a CFL, and a regular language

A. Need not be regular
B. Is always regular
C. Need not be context free
D. None of these

147. A PDM behave lie an FSM when the number of auxiliary memory it has is

A. 0 B. 1
C. 2 D. None of these

148. CSG can be recognized by a
A. FSM
B. NDPDM
C. DPDM
D. Linearly bounded memory machine

149. An FSM with
A. A stack is more powerful than a FSM with no stack
B. 2 stacks is more powerful than a FSM 1 stack
C. Both (A) and (B) above
D. None of these

150. Recursive languages are
A. Closed under intersection
B. Closed under complementation
C. Recursively enumerable
D. All of these

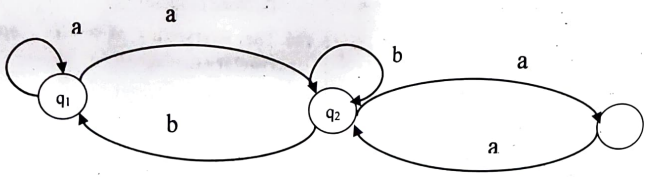
151. If $\omega \in (a, b)^*$ satisfy $ab\omega = \omega ab$ then 'ω' is
A. Even
B. Odd
C. Null
D. None of these

152. Let $f : (a, b)^* \rightarrow (a, b)^*$ be given by $f(n) = ax$ for every value of $n \in \{a, b\}$ then f is
A. One to one not onto
B. Not one to one and not onto
C. One to one and onto
D. Not one to one and onto

153. Let if $G = (\{S\}, \{\alpha\}, \{S \rightarrow SS\}, S)$, find language generated by G
A. $L(G) = \varphi$
B. $L(G) = a^*$
C. $L(G) = a^n$
D. $L(G) = a^n ba^n$

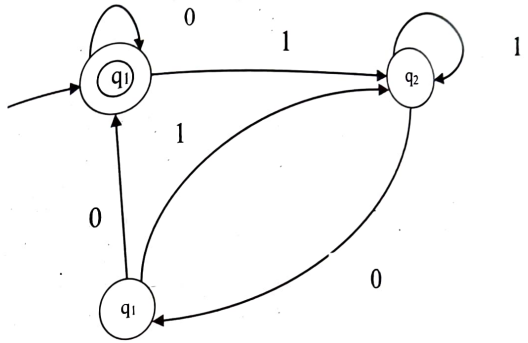
154. What is the highest type number which can be applied to the following grammar
$S \varphi \rightarrow Aa, A \rightarrow Ba, B \rightarrow abc$
A. Type 0
B. Type1
C. Type2
D. Type3

155. Construct a grammar to generate $\{(ab)^n/n \geq 1\} \cup \{(ba)^n/n \geq 1\}$
A. $S \rightarrow S_1, S_1 \rightarrow abS_1, S_1 \rightarrow ab, S \rightarrow S_2, S_2 \rightarrow baS_2, S_2 \rightarrow ba$
B. $S \rightarrow S_1, S_1 \rightarrow aS_1, S_1 \rightarrow ab, S \rightarrow S_2, S_2 \rightarrow bS_2, S_2 \rightarrow bc$
C. $S \rightarrow S_1, S_1 \rightarrow S_2, S_2 \rightarrow S_1a, S_1 \rightarrow ab, S_2 \rightarrow ba$
D. None of these



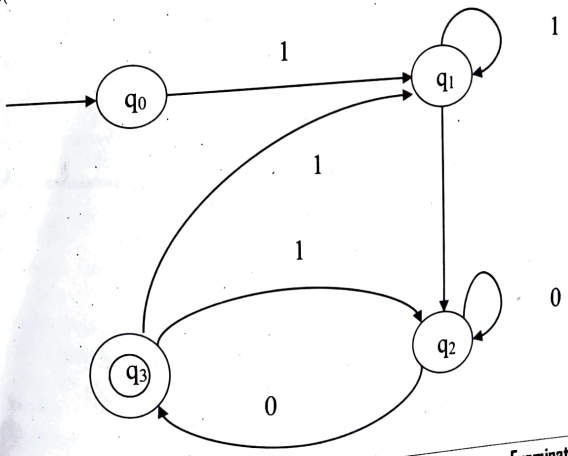
156. Which string recognize it?
A. $(a + b)^*$
B. $a + b(a + bb)^* (a + (b + aa)^*)^*$
C. $a^*b(b + aa)^*ba(b + aa)^*a$
D. Information is not complete

157. Regular expression corresponding to the state diagram given in below figure
A. $(0 + 1(1 + 01)^*00)^*$
B. $(0 + 1(1 + 10)00)^*$
C. $(1 + 0)(0 + 10)00)^*$
D. $(1 + 0(1 + 00)11)^*$



158. $L = \{a^p/P$ is a prime is a
A. Regular
B. Accepted by DFA
C. Not regular
D. Accepted by PDA

159. Regular expression corresponding to the automata given in figure below are:
A. $1(1 + 0(0 + 10)^* 11)^* 0(0 + 10)^*1$
B. $0(1 + 0(1 + 01)^* 11)^* 1(1 + 10)^*1$
C. $1(1 + 0(1 + 01)^*00)^*1(1 + 01)^*$
D. $0(1 + 0(1\,01)^*00)^* 1(1 + 01)^*1$



160. Grammar S → aAb, A → aAb/a is in

A. LR(1) not in LR(0)
B. LR(0) but not in LR(1)
C. Both LR(0) and LR(1)
D. Neither LR(0) nor in LR(1)

ANSWERS SHEET

1.A	2.A	3.A	4.A	5.A	6.D	7.B	8.C	9.C	10.D
11.B	12.C	13.A	14.C	15.A	16.D	17.C	18.C	19.B	20.C
21.D	22.A	23.B	24.D	25.A	26.D	27.A	28.D	29.D	30.B
31.D	32.A	33.B	34.D	35.B	36.C	37.C	38.A	39.C	40.D
41.B	42.D	43.D	44.C	45.A	46.B	47.D	48.D	49.D	50.C
51.C,B	52.A	53.C	54.C,D	55.D	56.A,B	57.B	58.B	59.B	60.D
61.B	62.B	63.C	64.B	65.B	66.C	67.B	68.C	69.C	70.C
71.C	72.B	73.D	74.A	75.B,D	76.B	77.B	78.C	79.A	80.B
81.D	82.B,C	83.B	84.D	85.B	86.D	87.C	88.B	89.D	90.B
91.D	92.C	93.A	94.C	95.B	96.C	97.B	98.A	99.D	100.B
101.D	102.C	103.D	104.A	105.A	106.B,C	107.C	108.B	109.B	110.A,C
111.B	112.C	113.D	114.A	115.B	116.C	117.D	118.D	119.B	120.B
121.C	122.B	123.A	124.D	125.D	126.A	127.D	128.B	129.D	130.C
131.D	132.D	133.A	134.A	135.D	136.C	137.B	138.D	139.D	140.D
141.A	142.A,D	143.B	144.B	145.A,C	146.C	147.A	148.A	149.A	150.B
151.A	152.A	153.A	154.D	155.A	156.D	157.A	158.C	159.A	160.A

MULTIPLE CHOICE QUESTIONS

Computer Graphics

1. **Expansion of CRT is:**
   A. Cathode Ray Tube
   B. Common Reflection Tube
   C. Computer Related Tube
   D. Common Reflection Tube
2. **The operations of most _____are based on the Standard Cathode ray tubes.**
   A. Scanner B. Printers.
   C. Video monitors. D. Card readers.
3. **A beam of electrons emitted by an electron gun is also called as _____.**
   A. Electric rays B. Cathode rays.
   C. Magnetic rays. D. Infra-red rays.
4. **Expansion of DDA is _____.**
   A. Device Display Analyzer.
   B. Digital Device Analyzer
   C. Digital Differential Analyzer.
   D. Digital Display Analyzer.
5. **Random scan displays are designed to draw all component lines at of a picture _____ times each second.**
   A. 20 to 40. B. 30 to 60.
   C. 40 to 70. D. 20 to 50.
6. **In beam penetration method, _____layers of phosphor are usually used.**
   A. 1 B. 2
   C. 3 D. 4
7. **In beam penetration method, _____and_____ layers of phosphor are usually used.**
   A. Red and green.
   B. Yellow and green
   C. Blue and green.
   D. Orange and green.
8. **VDU is a _____ device**
   A. Processing. B. Input.
   C. Peripheral. D. Hardware.
9. **The operation of the most video monitors is based on the_____ CRT.**
   A. Static.
   B. Dynamic.
   C. Standard.
   D. Pervasive.
10. **In cathode ray tube, a beam of electrons is emitted _____.**
    A. From the base.
    B. By an electron gun.
    C. By a focusing system.
    D. By deflection plates
11. **The negatively charged electrons inside the CRT are then accelerated towards the_____.**
    A. Phosphor coating
    B. Base
    C. Electron gun.
    D. Electron beam object
12. **The magnetic field produced by each pair of coils results in____ deflection force.**
    A. Transverse. B. Magnetic.
    C. Slopping. D. Repulsive.
13. **A major difference between phosphors is their _____.**
    A. Permanent state.
    B. Feebleness.
    C. Persistence.
    D. Magnetic deflection.