

1).The lexical analysis for a modern computer language such as Java needs the power of which one of the following machine models in a necessary and sufficient sense*

- A) AFinite state automata
- B) Deterministic pushdown automata
- C) Non-Deterministic pushdown automata
- D) Turing machines

2).In a compiler keywords of a language are recognized during

- A) parsing of the program
- B)the lexical analysis of the program
- C) the code generation
- D.data flow analysis

3).Which one of the following pairs has different expressive power*

- A) Deterministic finite automata (DFA) and Non-deterministic finite automata(NFA)
- B) Deterministic pushdown automata(DPDA) and Non-deterministic pushdown automata(NPDA)
- C) Deterministic single-tape Turing machine and Non-deterministic single tape Turing machine
- D) Single-tape Turing machine and multi-tape Turing machine

4).Which one of the following problems is decidable*m

- 1)Does a given program ever produce an output*
- 2) If L is a context-free language, then, is L also context-free*
- 3) If L is a regular language, then, is L also regular*
- 4) If L is a recursive language, then, is L also recursive*

A.1,2,3,4

B.2,3,4

C.1,2

D.3,4

5).Given the language $L=\{ab,aa,baa\}$,which one of the following strings are in L^*

- 1.abaabaaabaa
- 2.aaaabaaaa
- 3.baaaaabaaaab
- 4.baaaaabaa

- A) 1,2and3
- B) 1,2and4
- C) 2,3and4
- D) 1,3and4

6).What is the language generated by the grammar $S \rightarrow aSb, S \rightarrow A, A \rightarrow aA$

- A. $a^m b^m$
- B. \emptyset
- C. $a^n b^m$

D. a^m+1b^m

7). $(a, b)^+$ means

- A. Any combination of a, b including null
- B. Any combination of a, b excluding null
- C. combination of a, b, but 'a' will come first
- D. None of these

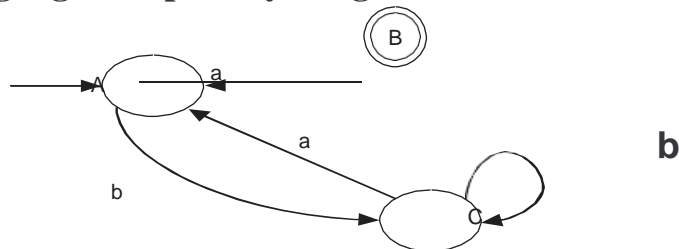
8). What is the highest type number to the grammar given by the following production rule $S \rightarrow Aa, A \rightarrow c|Ba, B \rightarrow abc$.

- A) Zero
- B) One
- C) Two
- D) Three

9). The transitional function of an NFA is

- A. $Q \times \Sigma \rightarrow Q$
- B. $Q \times \Sigma \rightarrow 2^Q$
- C. $Q \times \Sigma \rightarrow 2^n$
- D. $Q \times \Sigma \rightarrow Q^n$

10). The language accepted by the given FA is

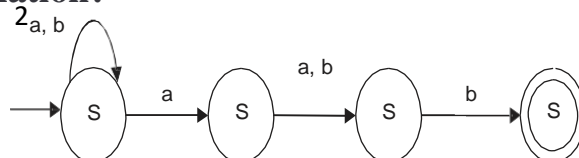


- A. $(ab)^*$
- B. bb^*a
- C. $b(ba^*a$
- D. Null

11). Which of the strings do not belong to the regular expression $(ba + baa)^*aaba$

- A. Baaaba
- B. Babaabaaaba
- C. babababa
- D. baaaaba

12). Which regular expression best describes the language accepted by the following non-deterministic automation?



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

13). For the language $L = \{ab, c\}$ over the set $B = \{a, b, c\}$. L^{-2} is

- A. all -2 word sequences in L
- B. all 2 word sequences in L
- C. $\{\lambda\}$
- D. none of the above

14). Consider the following Problem X: "Given a Turing Machine M over the input alphabet Σ , any state q of M and a word Σ^* , does the computation of M on w visit the state q ". Which of the following statements about X is correct?

- A. X is decidable
- B. X is undecidable but partially decidable
- C. X is undecidable and not even partially decidable
- D. X is not a decision problem

15). Halting problem/language is more described as

- A. RE as well as recursive
 - B. Recursive and NP
 - C. RE but not recursive
 - D. Neither recursive nor RE
- 16). Automata theory, computability theory, and complex theory are all topics covered in the study of the theory of computation. Which of the following represents the main objective of complexity theory?
- A. To classify problems as easy ones and hard ones
 - B. To classify problems by those that are solvable and those that are not solvable.
 - C. To deal with definitions and properties of mathematical models of computation.
 - D. All
- 17). What is the language and grammar accepted by pushdown automata?
- A. Regular language and type-3 grammar
 - B. Context-free language and type-2 grammar
 - C. Context-free language and type-3 grammar
 - D. Context-sensitive language and type-1 grammar
- 18). Which of the following is the mechanism for simplifying the context-free grammar?
- A. Eliminating useless symbols
 - B. Elimination \square -productions
 - C. Eliminating unit productions
 - D. All
- 19). Which one of the following languages over the alphabet $\{0, 1\}$ is described by the regular expression: $(0+1)^*0(0+1)^*0(0+1)^*$?
- a. The set of all strings containing the substring 00
 - b. The set of all strings containing at most two 0's
 - c. The set of all strings containing at least two 0's
 - d. The set of all strings that begin and end with either 0 and 1
- 20). In a computational complexity theory, a problem with decision making is said to be NP-complete when it is both in NP and NP-hard. What does NP mean?
- A. Non polynomial time
 - B. Non-deterministic polynomial time
 - C. Non-deterministic probabilistic
 - D. Non-probabilistic time
- 21). The grammar production: $A \rightarrow aB$ refers to which of the following forms?
- A. Greibach Normal Form
 - B. Chomsky Normal Form
 - C. Backus Naur Form/CFG
 - D. None
- 22). How many FAs exist that have 2 states and accept an empty string
- A. one
 - B. Two
 - C. Three
 - D. Many
- 23). Language which can be defined by FA is
- A. Regular Language
 - B. Non-regular language
 - C. May be regular may be non-regular!
 - D. Context free language
- 24). What is the main goal of a compiler?
- a. Execution of programs
 - b. Translation of programs
 - c. Optimization of programs
 - d. Debugging of programs
- 25). Regular expression for all strings starts with ab and ends with bba is.
- A. aba^*b^*bba
 - B. $ab(ab)^*bba$

- C. $ab(a+b)bba$
- D. $aba(ab)bba$

26). Which of the following is not an example of finite state machine system?

- A. Mechanism of an elevator
- B. Signal lights
- C. Digital Watches
- D. Microwave Ovens

27). A grammar with more than one parse tree is called:

- A. Unambiguous
- B. Ambiguous
- C. Regular
- D. Non Regular

28). The production of the form nonterminal \rightarrow one nonterminal is called the:

- A. Null production
- B. Null able production
- C. Unit production
- D. Both B and C

29). If there is a CFG for the language L that has no lamda-productions, then there is also a CFG

- A. Having lamda-production and no unit production
- B. No lamda-production but have unit production
- C. No lamda-production and no unit production
- D. Both b and c

30). A production in CFG consists of:

- A. One terminal
- B. More than one terminal
- C. One non-terminal
- D. Terminals and non-terminals

31). A push down automaton employs _____ data structure.

- A. Stack
- B. Queue
- C. Linked List
- D. Hash Table

32). Problems that can be solved in polynomial time are known as?

- A. Intractable
- B. Tractable
- C. Decision
- D. Complete

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33). Halting problem is an example for?

- A. Decidable problem
- B. Complete problem
- C. Undecidable problem
- D. Trackable problem

34). Which tool is used for grouping of characters in tokens in the compiler?

- A. Parser
- B. Code optimizer
- C. Code generator
- D. Scanner

35). Which derivation is generated by the bottom-up parser?

- A. Right-most derivation in reverse
- B. Left-most derivation in reverse
- C. Right-most derivation
- D. Left-most derivation

36). The output of the lexical analyzer is ____

- A. string character
- B. a syntax tree
- C. a set of RE

D. a set of tokens

37). If a grammar produces more than one leftmost derivation for a sentence, it is called as: _____

- A. Ambiguous grammar
- B. Perfect grammar
- C. Associative grammar
- D. Precedence

38). The intersection of a context-free language and a regular language is _____

- A. context-free
- B. neither context-free nor regular.
- C. regular but not context-free
- D. both regular and context-free.

39). Which one of the following is not part of Turing machine?

- A. Finite control
- B. Input
- C. Tape
- D. Head

40). Which of the following true production rule grammar in give language $L(G) = \{b^n a^{n+1} : n \geq 0\}$

- A. P: $S \rightarrow Ab, S \rightarrow aSb, A \rightarrow e$
- B. P: $S \rightarrow Aa, S \rightarrow bSa, A \rightarrow e$
- C. P: $S \rightarrow Ab, A \rightarrow bS, A \rightarrow a$
- D. P: $S \rightarrow Aa, A \rightarrow aS, A \rightarrow a$

41). Which of the following is the true all strings 0's and 1's starting with 0 and ending with 1 is

- A. $0(0+1)^*1$
- B. $0(0+1^*)1$
- C. $0(01)^*1$
- D. $0(01^*)1$

42). Which of the following is the true to Resolving Ambiguity Grammar

- A. Rewrite the grammar to resolve ambiguity explicitly
- B. Add a meta-rule using precedence and associativity rules
- C. Redesign the language to remove the ambiguity
- D. All

43). TM is a mathematical model which consists of an infinite length tape divided into cells on which input is given.

- A. Automata Machine
- B. Push down Automata
- C. Turing Machine
- D. Recursively enumerable

44). An abstract model of a digital computer to self operating machine.

- A. Language
- B. Grammar
- C. Automata
- D. Recursively enumerable

45). Which of the following statements is incorrect?*

- A) Context free grammar is subset of Regular grammar
- B) Regular grammar's help to generate regular sets
- C) Turing machine is type of automata
- D) A language is regular if there is an automaton that accepts it

46). The set of all strings over $\{a,b\}$ having exactly 3b's is represented by the regular expression*

- A) $a^*ba^*ba^*ba^*$
- B) ba^*ba^*b
- C) $a^*ba^*ba^*b$
- D) a^*bbb

47). Which of the following is false about context-free Grammar?*

- A) Left and right linear grammar are context-free grammars
- B) Regular grammar is not context-free grammar
- C) Simple grammar is context-free grammar
- D) Linear grammar is context-free grammar

- 48) . The function $\text{nil}(\text{abab})$ is equal to*
- A) abba
 - B) abab
 - C) λ
 - D) nilabab
- 49)._____ is a theoretical construct of Turing machine that can simulate any other Turing machine.
- a. Multi-tape Turing machine
 - b. Universal Turing machine
 - c. Multi track Turing machine
 - d. Semi-infinite Tape
- 50). Which of the following is a characteristic of a non-deterministic finite automaton (NFA)?
- a. An NFA requires a stack to store its state transitions.
 - b. An NFA can only recognize regular languages.
 - c. An NFA can have multiple possible transitions for a given input symbol and current state.
 - d. An NFA can recognize context-free languages
- 51). Which of the following best describes the halting problem for Turing machines?
- A. The halting problem refers to the problem of determining whether a given Turing machine will eventually halt or run indefinitely on a specific input.
 - B. The halting problem refers to the problem of determining whether a given Turing machine can recognize context-free languages.
 - C. The halting problem refers to the problem of determining whether a given Turing machine can simulate other computational models.
 - D. The halting problem refers to the problem of determining whether a given Turing machine can solve any computational problem.
- 52). Which of the following regular expressions represents the language that accepts strings over the alphabet $\{0, 1\}$ where the string contains at least one '0' and at least one '1'?
- a. $0+1$
 - b. $0+1+$
 - c. 0^*10^*
 - d. 0^*1^*
- 53). Which of the following statements accurately describes the concept of a Turing machine's transition function?
- a. The transition function defines the initial state of the Turing machine.
 - b. The transition function determines the number of steps the Turing machine can perform before halting.
 - c. The transition function determines the input symbols that are accepted by the Turing machine.
 - d. The transition function specifies the rules for changing the internal state and tape contents of the Turing machine.
- 54). Which type of Turing machine has two tapes, one tape read-only and the other read-write tape?
- a. Multi-dimensional Turing Machine
 - b. Multi-head Turing Machine
 - c. Offline Turing machine
 - d. Non-deterministic Turing machine
- 55)._____ represents the class of problems that are at least as hard as the hardest problems in NP?
- a. PSPACE
 - b. NP Complete
 - c. EXP
 - d. NP Hard
- 56). What is the Turing Test in the context of AI?
- a. A test to measure a machine's processing power
 - b. A test to evaluate the speed of AI algorithms
 - c. A test to measure a machine ability to exhibit intelligent behavior indistinguishable from that of a human
 - d. A test for computer hardware performance
- 57). $f(x) = x+2$ over N is_____ function
- A. Total

- B. Partial
- C. recursive
- D. both total and partial.

58). Which one of the following is concerned with the meaning of sentences in knowledge representation?

- A) structure
- B) syntax
- C) semantic
- D) computational aspect

59). given input alphabet $E = \{a, b, c, d\}$ and empty string λ then which one of the following is not an element of set E^+

- A) b
- B) abbccdd
- C) λ
- D) cd

60). One of the following grammars is correctly matched?

- A. $S \rightarrow S1ab, S1 \rightarrow S1ab|S2, S2 \rightarrow a$ is context-free grammar
- B. $S \rightarrow S1ab, S1 \rightarrow S1ab|S2, S2 \rightarrow a$ is Regular grammar
- C. $S \rightarrow S1ab, S1 \rightarrow S1ab|S2, S2 \rightarrow a$ left linear grammar
- D. A and B

61). How many languages are over the alphabet R?

- A. countably infinite
- B. countably finite
- C. uncountable finite
- D. uncountable infinite

62). There are _____ tuples in finite state machine.

- A. 4
- B. 5
- C. 6
- D. unlimited

63). Assume the R is a relation on a set A, aRb is partially ordered such that a and b are _____

- A. Reflexive
- B. Transitive
- C. Symmetric
- D. reflexive and transitive

64). The minimum number of states required to recognize an octal number divisible by 3 are/is

- A. 1
- B. 3
- C. 5
- D. 7

65). 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.

- A. Statement 1 is true and Statement 2 is true
- B. Statement 1 is true and Statement 2 is false
- C. Statement 1 can be true and Statement 2 is true
- D. Statement 1 is false and Statement 2 is also false

66). An automaton that presents output based on previous state or current input:

- A. Acceptor
- B. Classifier
- C. Transducer
- D. None of the mentioned.

67). Which one of the following false about role of parser in compiling process

- A) parser attempt to correct or recover few errors
- B) parser cannot perform context free syntax analysis
- C) parser build the parse tree
- D) parser produce appropriate message errors

- 68). Let $L1 = \{w \in \{0,1\}^* \mid w \text{ has at least as many occurrences of } (110)\text{'s as } (011)\text{'s}\}$.
 Let $L2 = \{w \in \{0,1\}^* \mid w \text{ has at least as many occurrences of } (000)\text{'s as } (111)\text{'s}\}$.
 Which of the following is correct?
 A. $L2$ is regular
 B. $L1$ and $L2$ are regular
 C. $L1$ is regular but not $L2$
 D. None of them are regular
- 69). Given the following productions: $E \rightarrow E * F \mid E + F \mid F$
 $F \rightarrow F - F \mid id$ Which one of the following is True?
 A. $*$ has higher precedence than $+$
 B. $-$ has higher precedence than $*$
 C. $-$ and $+$ have the same precedence
 D. $+$ has higher precedence than $*$
- 70). Which of the following derivation does a top - down parser uses while parsing an input string?
 A. Left-most derivation in reverse
 B. Left-most derivation
 C. Right-most derivation in reverse
 D. Right -most derivation
- 71). All of the following are functions of semantic analysis except _____.
 A. Do operators match their operands?
 B. Do types of variables match the values assigned to them?
 C. Do function parameters match the function declarations?
 D. Have called function and variable names been declared?
 E. Do statements miss semi-colon?
- 72). Which of the following features cannot be captured by context free grammar?
 A. Syntax of if-then-else statements
 B. Syntax of recursive functions
 C. A variable is declared before its use
 D. Matching nested parenthesis
- 73). The regular expression for the language of all strings of 0's and 1's with no two consecutive 0's is _____.
 A. $(0+1)$
 B. $(0+1)^*$
 C. $(0+\square)(1+10)^*$
 D. $(0+1)^* 011$
- 74). Consider the grammar: $S \rightarrow FR$
 $R \rightarrow * S \mid \epsilon$ 8
 $F \rightarrow id$ In the predictive parsing table M, of the grammar, the entries $M[S, id]$ and $M[R, \$]$ respectively
 A. $(S \rightarrow FR)$ and $(R \rightarrow \epsilon)$
 B. $(S \rightarrow FR)$ and $(R \rightarrow \{\})$
 C. $(S \rightarrow FR)$ and $(R \rightarrow * S)$
 D. $(F \rightarrow id)$ and $(R \rightarrow \epsilon)$
- 75). Consider three decision problems P_1 P_2 and P_3 . It is known that P_1 is decidable and P_2 is undecidable. Which one of the following is TRUE?
 A. P_3 is decidable if P_1 is reducible to P_3
 B. P_3 is undecidable if P_3 is reducible to P_2
 C. P_3 is undecidable if P_2 is reducible to P_3
 D. P_3 is decidable if P_3 is reducible to P_2 's complement
- 76). What type of language do Turing machines generate?
 A. Regular languages
 B. Context free
 C. Recursive enumerable languages
 D. Content sensitive
- 77). Which one of the following is true for NFA machine M to accept a string?
 A. All the symbols of input string must be scanned and all the paths must end at an accepting state.
 B. All the symbols of input string may not be scanned but it must reach at some accepting

state.

C. All the symbols of input string is scanned and the last state is non-accepting.

D. All the symbols of input string must be scanned and one the paths must end at an accepting state.

E. None of these

78). The regular expression $r = b^*ab^* + b^*$ represents any string w over $\{a,b\}$:

A. starting with b and having no other a 's or having no a 's but only b 's

B. having at least one a

C. having at most one a 's

D. starting with b and ending with a

79). A universal Turing machine is _____

A. Two tape Turing machine

B. Single tape Turing machine

C. Reprogrammable Turing machine

D. All of these

80). Let X be a problem that belongs to the class NP. Then which one of the following is TRUE?

A. There is no polynomial time algorithm for X

B. If X can be solved deterministically in polynomial time, then $P = NP$

C. If X is NP-hard, then it is NP-complete

D) If πA is NP-hard, then it is NP-complete

E. X may be undecidable

81). machine learning is grouped under... Generation of programming language

A)3rd generation

B)1st generation

C)2nd generation

D)4th generation

82). Which of the following is false about Context-Free Grammar

A. Context-free grammar is subset of Regular Grammar

B. Linear grammar is context-free grammar

C. Left Linear grammar is subset of context-free grammar

D. Left and right linear grammar are context-free grammars

83).the language processor translate the program into object code is

A) linker

B) debugger

C) compiler

D) interpreter

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84). Which one of the following is correct ordering in language processing system.

A) source program->preprocessor->assembler ->compiler ->linker/loader->target machine code

B)source program->preprocessor-> linker/loader->compiler->assembler ->target machine code

C) source program->compiler ->Assembler->preprocessor->linker/loader->target machine code

D)source program->preprocessor->compiler ->assembler ->linker/loader->target machine code

85). From the list of alternatives below, Identify the one which is different?

A. Left linear grammar

B. Right Linear Grammar

C. Regular Grammar

D. Linear Grammar

86). If a grammar is defined with $G=(V,T,S,P)$, with $A \rightarrow x$ where $A \in V, x \in (V \cup T)^*$, the type of grammar is?

A. Context Sensitive Grammar

B. Recursive Grammar

C. Regular Grammar

D. Context Free Grammar

87).What does the term "P versus NP problem" refer to in computational complexity theory?

a. The problem of distinguishing between parallel and non-parallel algorithms.

b. The problem of determining the runtime of algorithms.

c. The problem of comparing the efficiency of programming languages.

- d. The problem of determining if certain types of problems have efficient algorithms.
- 88). Which complexity class includes problems that can be solved by a non-deterministic Turing machine in polynomial time?
- P
 - NP
 - NP-complete
 - Exponential
- 89). Which of the following describes the relationship between formal languages, formal grammars, and automata?
- Formal languages are generated by formal grammars, which are recognized by automata.
 - Formal languages recognize automata, which are generated by formal grammars.
 - Formal grammars generate automata, which recognize formal languages.
 - Formal grammars recognize formal languages, which generate automata..
- 90). Which of the following is an example of a formal language?
- English
 - Spanish
 - Regular expressions
 - French.
- 91). Which type of automaton is used to recognize regular languages?
- Turing machine
 - Pushdown automaton
 - Finite automaton
 - Non-deeterministic automaton
- 92). Which of the following statements is true regarding the Chomsky hierarchy?
- Context-free languages are a subset of regular languages
 - Context-sensitive languages are a subset of recursive languages.
 - Regular languages are a subset of recursive languages.
 - Context-free languages are a subset of recursive languages..
- 93). Which of the following is true regarding deterministic finite automata (DFAs)?
- DFAs can recognize all regular languages.
 - DFAs have multiple possible transitions for each input symbol.
 - DFAs can have empty transitions.
 - DFAs can recognize context-free languages.
- 94). Which type of automaton is more expressive than a finite automaton but less powerful than a Turing machine?
- Pushdown automaton
 - Non-deterministic finite automaton
 - Turing machine
 - Context-sensitive automaton
- 95). Which of the following is an example of a type coercion or type conversion?
- Assigning a floating-point value to an integer variable.
 - Assigning a value to an uninitialized variable.
 - Declaring a variable without specifying its type.
 - Using an undeclared variable in the program.
- 96). Which of the following is true regarding NP-complete problems?
- NP-complete problems are only solvable by nondeterministic algorithms.
 - NP-complete problems are a subset of NP problems.
 - NP-complete problems can be solved in exponential time.
 - NP-complete problems have no practical applications.
- 97). Which of the following complexity classes represents the hardest problems in NP?
- P
 - NP-complete
 - NP-hard
 - PSPACE
- 98). Which of the following is true regarding the halting problem?
- The halting problem can be solved by a Turing machine.
 - The halting problem is decidable for all programs.

- c. The halting problem is an undecidable problem.
- d. The halting problem is only relevant to regular languages.

99). Which of the following is a regular language?

- a. $\{anbn \mid n \geq 0\}$
- b. $\{anbncn \mid n \geq 0\}$
- c. $\{an \mid n \text{ is a prime number}\}$
- d. $\{anb \mid n \geq 0\}$

100). Which type of grammar is capable of generating context-free languages?

- a. Regular grammar
- b. Context-free grammar
- dc. Context-sensitive grammar
- . Unrestricted grammar

101). Which of the following is true about the relationship between context-free languages and context-sensitive languages?

- a. Every context-sensitive language is also a context-free language.
- b. Every context-free language is also a context-sensitive language.
- c. Context-free languages are a strict subset of context-sensitive languages.
- d. Context-free languages are unrelated to context-sensitive languages.

102). Which type of automaton is capable of recognizing context-sensitive languages?

- a. Finite automaton
- b. Pushdown automaton
- c. Turing machine
- d. Non-deterministic automaton

103). Which of the following is an example of a recursively enumerable language?

- a. Regular language
- b. Context-free language
- c. Context-sensitive language
- d. Turing-recognizable language

104). Which class of languages is the most powerful in terms of generative power?

- a. Regular languages
- b. Context-free languages
- c. Context-sensitive languages
- d. Recursively enumerable languages

105). Which of the following is true about the relationship between recursively enumerable languages and recursive languages?

- a. Every recursive language is also a recursively enumerable language.
- b. Every recursively enumerable language is also a recursive language.
- c. Recursive languages are a strict subset of recursively enumerable languages.
- d. Recursive languages are unrelated to recursively enumerable languages.

106). Which of the following is an example of an undecidable problem?

- a. Checking if a given number is prime
- b. Sorting a list of numbers in ascending order
- c. Solving a system of linear equations
- d. Determining if a Turing machine halts on a given input

107). Which of the following is an example of a non-recursive language?

- a. $\{anbncn \mid n \geq 0\}$
- b. $\{an \mid n \text{ is a prime number}\}$
- c. $\{ww^R \mid w \text{ is any string}\}$
- d. $\{anb \mid n \geq 0\}$

108). Which of the following is true about the Chomsky hierarchy?

- a. It categorizes formal languages based on their computational complexity.
- b. It categorizes formal languages based on their expressive power.
- c. It categorizes formal languages based on their alphabet size.
- d. It categorizes formal languages based on their syntactic structure.

109). Which type of grammar is used to generate the language $L = \{anbn \mid n \geq 0\}$?

- a. Regular grammar

- b. Context-free grammar
- c. Context-sensitive grammar
- d. Unrestricted grammar.

110). Which of the following is a context-sensitive language?

- a. $\{anbn \mid n \geq 0\}$
- b. $\{anbm \mid n, m \geq 0\}$
- c. $\{an \mid n \text{ is a prime number}\}$
- d. $\{anb \mid n \geq 0\}$

111). Which type of automaton is used to recognize the language $L = \{anbn \mid n \geq 0\}$?

- a. Finite automaton
- b. Pushdown automaton
- c. Turing machine
- d. Non-deterministic automaton

112). Which of the following grammars generates the language $L = \{wwR \mid w \text{ is any string}\}$?

- a. Regular grammar
- b. Context-free grammar
- c. Context-sensitive grammar
- d. Unrestricted grammar

113). Which type of automaton is used to recognize the language $L = \{wwR \mid w \text{ is any string}\}$?

- a. Finite automaton
- b. Pushdown automaton
- c. Turing machine
- d. Non-deterministic automaton

114). Which type of grammar is used to generate the language $L = \{0n1n2n \mid n \geq 0\}$?

- a. Regular grammar
- b. Context-free grammar
- c. Context-sensitive grammar
- d. Unrestricted grammar

115). Which type of automaton is used to recognize the language $L = \{0n1n2n \mid n \geq 0\}$?

- a. Finite automaton
- b. Pushdown automaton
- c. Turing machine
- d. Non-deterministic automaton

116). Which type of grammar is used to generate the language $L = \{an \mid n \text{ is a prime number}\}$?

- a. Regular grammar
- b. Context-free grammar
- c. Context-sensitive grammar
- d. Unrestricted grammar

117). Which type of automaton is used to recognize the language $L = \{an \mid n \text{ is a prime number}\}$?

- a. Finite automaton
- b. Pushdown automaton
- c. Turing machine
- d. Non-deterministic automaton

118). Which type of grammar is used to generate the language $L = \{anb \mid n \geq 0\}$?

- a. Regular grammar
- b. Context-free grammar
- c. Context-sensitive grammar
- d. Unrestricted grammar

119). Which complexity class contains problems that can be solved in polynomial time?

- a. P
- b. NP
- c. PSPACE
- d. EXPTIME

120). Which complexity class represents the set of problems that can be verified in polynomial time?

- a. P
- b. NP

- c. PSPACE
- d. EXPTIME

121). Which complexity class contains problems that can be solved using polynomial space?

- a. P
- b. NP
- c. PSPACE
- d. EXPTIME

122). Which concept is used to show that one problem can be reduced to another problem in order to prove hardness or completeness?

- a. Reductions
- b. Hierarchy
- c. Completeness
- d. Complexity classes

123). Which complexity class represents the most difficult problems in a particular class?

- A) NP-COMPLETE
- b. NP
- c. PSPACE
- d. EXPTIME

124). Let a Grammar $G((S), \{a, b\}, S, P)$, where $\{S\}$ is set of variables, $\{a, b\}$ is set of terminal symbols, S is start variable and P is set of productions.

Then which one of the following is not an element of the language (L) which is generated from G . Given:

$P: S \rightarrow aSb$.

$S \rightarrow \square$

- A. a
- B. aabb
- C. ab
- D. \square

125). Given input alphabet $\Sigma = \{a, b, c, d\}$ and empty string λ . Then, which one of the following is false about λ ?

- A. $\lambda ab = ab$
- B. For any string Z , $Z^0 = \lambda$
- C. λ is an element of Σ^+
- D. $|\lambda| = 0$

126). What will be the value of Z^R if it is given that string $Z = caddba$?

- A. abddac
- B. cad
- C. abd
- D. caddba

127). If we have two strings $Z = cddc$ and $W = ababb$, then the concatenation of the two strings ZW will be?

- A. $ZW = cddcababb$
- B. $ZW = cdab$
- C. $ZW = ababbcdcd$
- D. $ZW = ca$

128). Which one of the following is false about any language L ?

- A. $3 = 1 1 1$
- B. $0 =$
- C. $* = 0 1 2 3 4$
- D. $+ = 1 2 3 4 5$

129). Given input alphabet $\Sigma = \{a, b, c, d\}$ which one of the following is an element of set Σ^2 ?

- A. b
- B. c
- C. ac
- D. aabbccdd

130). Which branch of study deals with whether a problem can be solved at all or not, regardless of the resources required?

- A. Automata theory
- B. Set theory
- C. Computability theory
- D. Complexity theory

131). What will be the value of $|Z|$ if it is given that string $Z = caddba$?

- A. 3
- B. 4
- C. 2
- D. 12

132). Which class of the language is most suited to be represented by pushdown automata?

- A) context free language
- B) regular language
- C) recursive enumerable language
- D) unrestricted language

133). $a \rightarrow b$, L state transition in a Turing machine means.

- A) read a, write b and move left
- B) delete a, read b and move left
- C) write a, read b and move left
- D) replace b by a and move left

134). Which of the following is not a component of Turing machine?

- A) read-write head
- B) control unit
- C) stack
- D) tape

135). In grammar, if $S \rightarrow \lambda$ where S is a non-terminal, such a production is called - - -?

- A) null Production
- B) unit Production
- C) secondary production
- D) sigma production

136). Which string from the following is a member of the language represented by the regular expression, $a^*(b+c)$?

- A) aab
- B) bc
- C) aaa
- D) aaabc

137). When can we say two grammars are equivalent?

- A) When the language derived from one of the grammars becomes the subset of the other
- B) When the alphabet of the two grammars are the same
- C) When the language represented by both grammars are equal
- D) When a single string is a member of the language represented by both grammars

138). Which of the following is an advantage of using an intermediate representation during the compilation process?

- a. Faster compilation speed
- b. Improved error detection
- c. Portability across different platforms
- d. Reduced memory usage

139). Which theory provides a mechanism to classifying combinatorial problems and measuring the computational resource necessary to solve them?

- A) set theory
- B) computability theory
- C) automata theory
- D) complexity theory

140). If there are two languages $L_1 = \{c, d\}$ and $L_2 = \{e, f, g, h\}$. Which one of the following is not an element of $L_2 L_1$?

- A) fghe
- B) fghe

C)ec

D)ed

141). From the following grammars, which describes the lexical syntax?

- A. Lexical Grammar
- B. Context-free Grammar
- C. Syntactic Grammar
- D. Regular Grammar

142). Which one of the following languages over alphabet{0,1} is described by the regular expression

$(0+1)^*0(0+1)^*0(0+1)^*$

- A) Strings with substring00
- B) Strings with at least two 0's
- C) Strings with at most two0's
- D) Strings with postfix1.

143).Transition functioning FSA maps which pair?

- A) Qand Σ to Σ
- B) Qand Q to Σ
- C. Σ and Σ to Q
- D.Qand Σ toQ

144).Transition function in FSA maps which pair

- A) QandZtoZ
- B) QandQtoZ
- C) ZandZtoQ
- D) QandZtoQ

145).A grammar has the following productions:

$A \rightarrow aB | bA | bBa \quad B \rightarrow bB | cA | b$

Which one of the following strings is in the language generated by the grammar

- A) abbcabbcbbbbcbba
- B) bcbbbcabbbcbba
- C) acbcbbbbcbaba
- D) (bbbbcbbbbcbab

146).When we can say two grammars are equivalent?

- A) When the languages represented by both grammars are the same
- B) When the language derived from one of the grammars become the subset of the other
- C) When the alphabets of the two grammars are the same
- D) When a single string is member of the language represented by both grammars

147).If L_1 and L_2 are two regular languages,which one of the following is true

- A) $L_1 \cup L_2$ is are gular language only if empty string is not a member
- B) L_1^* is the same with L_2^* and are both regular languages
- C) $(L_1 L_2)$ is also a regular language
- D) L^R is are gular language and is equivalent to L

148).Let $G = \{N, T, P, S\}$ be a grammar where:

$N = \{S, A\}, T = \{0, 1\}, S = \{S\}$ and $P = \{S \rightarrow 11S \mid 0A \mid 1A, A \rightarrow 0 \mid 1 \mid 0S\}$.

Which one of the following is a sentential form?

- A.111011110S
- B.11111101
- C.0000111001AS
- D.00001110A

149).Which one of the following properties of a graph represents the derivation steps performed to generate avalid string?

- A) Root of the graph
- B) Degree of the vertex

C) Path of a vertex from the root

D) Parent vertex

150). Which type of Turing machine has two tapes, one tape read-only and the other read-write tape?

N.B An “Offline Turing Machine” has two tapes. One tape is read-only and contains the input, the other is read-write and is initially blank. “Offline Turing machines are equivalent to Standard Turing machines”

A. Multi-dimensional Turing machine

B. Off-line Turing machine

C. Non-deterministic Turing machine

D. Multi-head Turing machine

151). What is the role of a formal grammar in relation to a formal language?

A. It specifies the syntax and semantics of the language.

B. It defines the alphabet and rules for generating valid strings in the language.

C. It provides a set of keywords and operators for the language.

D. It determines the types and data structures used in the language.

152). Which class of formal languages is defined by regular expressions and can be recognized by finite automata?

A. Regular languages

B. Context-free languages

C. Context-sensitive languages

D. Recursively enumerable languages

153). Which of the following is a valid example of a context-free grammar production rule?

A. $A \rightarrow aBa$

B. $AB \rightarrow BA$

C. $A \rightarrow \epsilon$

D. $Aa \rightarrow aA$

154). What is the primary goal of type checking in a compiler?

a. To ensure syntactic correctness of the program.

b. To generate efficient machine code.

c. To enforce programming language rules and constraints.

d. To provide support for code reuse through libraries

155). Which complexity class represents the set of problems for which a solution can be verified in polynomial time on a non-deterministic Turing machine?

A. P

B. NP

C. PSPACE

D. EXPTIME

156). What is the relationship between P and NP complexity classes?

A. $P = NP$

B. $P \subset NP$

C. $NP \subset P$

D. $P \cap NP = \emptyset$

157). Which technique is commonly used for syntax analysis in compilers?

A. Abstract Syntax Trees

B. Dynamic Programming

C. Backtracking

D. Finite Automata

158). Which phase of the compiler ensures the correctness of the program's logic, such as type compatibility, scoping rules, and other language-specific rules?

A. Lexical Analysis

- B. Semantic Analysis
- C. Syntactic Analysis
- D. Code Generation

159). Which technique is commonly used for lexical analysis in compilers?

- A. Finite Automata
- B. Backtracking
- C. Abstract Syntax Trees
- D. Greedy Algorithms

160). Which of the following best describes the role of a compiler?

- A. Translates high-level programming languages to machine code
- B. Executes programs and produces output
- C. Provides an integrated development environment
- D. Analyzes and detects runtime errors in the program

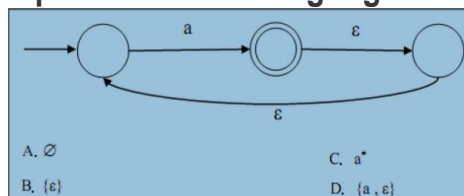
161). What does semantic analysis in compiler design primarily focus on?

- A. Translating the program into an intermediate representation
- B. Checking type compatibility and performing type inference
- C. Transforming the program to improve its efficiency
- D. Generating the target machine code

162). What is type checking in compiler design?

- A. A process of verifying the syntax of the input program
- B. A technique to optimize the generated machine code
- C. An analysis to ensure the compatibility and correctness of data types
- D. A step to generate intermediate code for the program

163). What is the complement of the language accepted by the NFA shown below* Assume $Z(a^T$ and e is the empty string*



164). Which one of the following phases is done before semantic analysis phase of compiling process?

- A. Syntax analysis
- B. Code optimization
- C. Code generation
- D. Intermediate code generation

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165). Which statement is false about programming language generations?

- A. Assembly language is machine independent
- B. Assembly language should be translated to machine language before execution
- C. Machine language can be executed without translation
- D. Fifth generation programming languages need very powerful hardware and software

166). Which one of the following is used for the purpose of syntax analysis?

- A. Loader
- B. Scanner
- C. Linker
- D. Parser

167). Which phase of compiling process is considered as the final phase in the process?

- A. Code optimization
- B. Code generation
- C. Semantic analysis
- D. Intermediate code generation

168). Which one of the following is not high-level language?

- A. C++
- B. Java
- C. Python
- D. Assembly

169. Which of the following generation that stated for the high level languages like C++, Java, Python?

- A. 2nd generation
- B. 3rd generation
- C. 4th generation
- D. None of the above

170). Which of the following generation that stated for interpreted language such like SQL?

- A. 4 th generation
- B. 2 nd generation
- C. 3 rd generation
- D. All of the above

171). Which one of the following is a type of compiler which compiles only the changed lines from source code and updates the object code accordingly?

- A. Retargetable compiler
- B. One pass compiler
- C. Incremental compiler
- D. Parallelizing compiler

172). Which technique of code optimization shifts computations from run time to compile time by evaluating constant expressions at compile time and replace the constant expressions by their values?

- A. Copy propagation
- B. Compile time evaluation
- C. Code motion
- D. Dead code Elimination

173). Fortran, cool, lisp, c, c++, c#, and Java are grouped under.... generation of programming languages

- A) 3rd generation language
- B) 4th generation language
- C) 2nd generation language
- D) 1st generation language

174). which one of the following is not the purpose of code optimization phase of the compiling process

- A) achieving faster execution
- B) changing behavior of programs
- C) producing fewer instruction
- D) producing better code

175). which program takes one or more object files generated by compiler or assembler and combines them into a single executable program?

- A) debugger
- B) linker
- C) loader
- D) editor

176). which one of the following is not an example of programming language

- A) c++
- B) java
- C) assembly language
- D) c#

177). Which one of the following is the output of syntax analysis phase?

- A) syntax tree
- B) annotated parse tree
- C) abstract syntax tree
- D) pattern

178).in which phase of the compilation process does the source program get broken into it's consistent part?

- A)semantic analysis
- B)syntax analysis
- C)synthesis
- D)lexical analysis

179). which one is an efficient top down parser!

- A) recursive descent parser
- B) shift reduce parser
- C) non recursive predictive parser
- D) LR parser

180).which one of the following is not a static check?

- A)type checking for compatibility
- B) uniqueness checks like redefined variable
- C)a break instruction that is not in closing statement
- D)memory access errors

181) .A program that translates a high-level language like C++ to a machine language is called a _____

- A, Compiler
- B, Disassembler
- C, Coder
- D, Assembler

182).Which of the following is true about syntax-directed translation?

- a. It only involves the lexical analysis phase.
- b. It involves the generation of intermediate code from the parse tree.
- c. It is concerned with the optimization of the generated code.
- d. It is performed during the code generation phase

183).Which of the following is NOT the primary role of code generator in compiler design? *

- A.Declaration of variables
- B.Register allocation
- C.instruction selection
- D.instruction ordering

184). Which one of the following is different from the others?

- A. quadruples
- B. triples
- C. tree
- D. indirect triples

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185).When is the type checking usually done

- A.During syntax directed translation
- B.During syntax analysis
- C.During code optimization
- D.During lexical analysis

186). Which of the following can NOT represents a target Code?

- A. Three address code
- B. Assembly language
- C. Absolute machine code
- D. Byte Code

187). Which of the following is NOT important property of intermediate code representation?

- A. Ease of generation
- B. Ease of manipulation
- C. Register allocation
- D. Level of abstraction

188.) Which of the following is a technique for syntax analysis that is based on a top-down parsing approach

- A.LL(1)

- B.LALR
- C.LR(1)
- D.Operator-precedence

189). Which of the following is an example of a semantic error in a program?

- A.Using a variable before it is declared
- B.Assigning an integer value to a string variable
- C.Misspelling a keyword
- D.Dividing a number by a string

190).Which of the following is not a regular language

- A.{w | w contains an even number of 0's and an odd number of 1's}
- B.{w | w begins with 0 and ends with 1}
- C.{w | w contains only the symbols 0 and 1 and has at least three 0's}
- D.{w | w contains an equal number of 0's and 1's}

191). Which one of the following is Chomsky's normal form?

- A.---> Sa|b
- B.S --->ASB|b
- C.S --->AS|a
- D.S --->AS|ab

192).Which of the following is an example of a lexical error in a program?

- A.Using a variable before it is declared
- B.Assigning an integer value to a string variable
- C.Misspelling a keyword
- D.Dividing by zero

193). Which one of the following program components is the compiler cannot generate a token.

- A.sequence character follows none of specified pattern
- B.white space
- C.Comment
- D.All of the above

194).Which one of the following is the smallest meaningful sequence of characters of interest in source program

- A) Pattern
- B) Lexemes
- C) Tokens
- D) All

195). Which one of the following are the specific character strings that make up a token?

- A) Token
- B) Lexemes
- C) Lexical units
- D) Pattern

196). Which one of the following are the program properties that can be checked at run time?

- A) Static checking
- B) Dynamic semantics
- C) Other Static Checks
- D) None

197). Which one of the following are the secondary tasks for scanner?

- A) Stripping out blanks, tabs, new lines
- B) Stripping out comments
- C) Error reporting
- D) All

198). Which one of the following is correct about narrowing casting?

- A) Done by the programmer
- B) It is automatic
- C) Done by the compiler
- D) All

199). Which one of the following is not an example of checked exceptions?

- A) Missing semicolons
 - B) Array index out of bounds
 - C) Usage of undeclared variables
 - D) File required not found
- 200). Which phase of the compiler checks the grammar of the programming?
- A. Code optimization
 - B. Semantic analysis
 - C. Code generation
 - D. Syntax Analysis
- 201). Which compiler runs on one machine and generates code for multiple machines?
- A. Multipass compiler
 - B. Cross compiler
 - C. Optimizing compiler
 - D. Onepass compiler
- 202). Consider a program P that consists of two source modules M1 and M2 contained in two different files. If M1 contains a reference to a function defined in M2 the reference will be resolved at_____.
- A. Edit time
 - B. Compile time
 - C. Link time
 - D. Load time
- 203). Which one of the following doesn't describe syntax-directed definitions?
- A. Hide many implementation details such as order of evaluation of semantic actions
 - B. Indicate the order of evaluation of semantic actions associated a production rule
 - C. Give high-level specifications for translations
 - D. All
- 204). Which of the following checks is a typical example of static checking?
- A. Flow of control checks
 - B. Uniqueness checks
 - C. Type checks
 - D. All
- 205). Which one of the following is commonly used by lexical analyzers to define patterns for tokens?
- A. Parse Tree
 - B. Symbol Table
 - C. Regular Expressions
 - D. Abstract Syntax Tree
- 206). Which is not correct about computers evolution?
- A. Increasing component size
 - B. Increasing processor speed
 - C. Increasing I/O capacity
 - D. Increasing memory size
- 207). What role does a type system play in the type-checking process?
- A. It defines the syntax rules of the programming language.
 - B. It specifies the set of all valid tokens in the language.
 - C. It determines the type of each expression and enforces type rules.
 - D. It generates machine code from intermediate code.
- 208). Which principle of compiler design ensures that the generated code runs efficiently on the target platform?
- A. Lexical Analysis
 - B. Syntax Analysis
 - C. Semantic Analysis
 - D. Code Optimization
- 209). Which of the following is NOT a role of a lexer in a compiler?

- A. Identifying tokens
 - B. Performing semantic analysis
 - C. Ignoring whitespace and comments
 - D. Generating errors for invalid tokens
- 210). Which parsing technique uses a predictive approach and can handle recursive descent parsing without backtracking?
- A. LR Parsing
 - B. LL(1) Parsing
 - C. Bottom-Up Parsing
 - D. Top-Down Parsing
- 211). Which one of the following false about role of parser in compiling process
- A) parser attempt to correct or recover few errors
 - B) parser cannot perform context free syntax analysis
 - C) parser build the parse tree
 - D) parser produce appropriate message errors
- 212). Which program puts together the entire executable objects file into memory for execution execution or running
- A) editor
 - B) debugger
 - C) linker
 - D) loader
- 213). Which one of the following is concerned with the meaning of sentences in knowledge representation?
- A) structure
 - B) syntax
 - C) semantic
 - D) computational aspect
- 214)...is Constructs the desired target program from the intermediate representation.
- A. analysis
 - B. assembler
 - C. interpreter
 - D. synthesis
- 215). Which of the following is an advantage of using type checking in a compiler?
- a. Improved program performance.
 - b. Enhanced code optimization.
 - c. Early detection of potential runtime errors.
 - d. Simplified debugging process
- 216). In the statement “Abebe wants it” we can clearly see that the “it” keyword does not make any sense. In fact, it is referring to anything that we don’t know. That is nothing but this “it” word depends upon the previous sentence which is not given. So which NLP phase concern.
- A. Syntax Analysis
 - B. Discourse Integration
 - C. Pragmatic Analysis
 - D. Semantic Analysis
- 217). The bottom-up parsing method is also called.....
- A. Shift reduces parsing.
 - B. Predictive parsing
 - C. Recursive descent parsing
- 218). From the following, which one is not the role of lexical analyzer?
- A. produce as output a sequence of tokens
 - B. stripping out blanks, tabs, new lines
 - C. group them into syntax tree
 - D. to read a stream of tokens from the source program
- 219). Syntactical structure of a programming language is checked at phase of a compiler.*
- A. Syntax analysis
 - B. Lexical analysis

C.Semantic analysis

D.Code generation

220). The process of converting non-deterministic grammar into deterministic grammar is called ____ *

A.left recursion

B.Precedence

C.left factoring

D.Association

221). A sequence of steps that replacement of structure names by choices on the right-hand side of grammar rules is ____ *

A.association

B.Derivation

C.recedence

D.Parsing

222). Which of the following is not primary tasks of code generator?

A.Declaration of variables

B.instruction ordering

C.Register allocation

D.instruction selection

223).What is the primary goal of type checking in a compiler?

a. To ensure syntactic correctness of the program.

b. To generate efficient machine code.

c. To enforce programming language rules and constraints.

d. To provide support for code reuse through libraries.

224).If you are asked to construct a finite automaton that accepts strings of the form “abⁿ where n \geq 0”, which of the following statement about the finite automata is false?

a.The accepting state is q₁

b.The accepting state is q₂

c.None

d.The initial state is q₀

225).Which phase of the compiler is responsible for error handling and reporting?

a. Lexical Analysis

b. Syntax Analysis

c. Semantic Analysis

d. Error Handling

226).Which phase of the compiler checks the grammar of the programming?

a.Code optimization

b.Syntax Analysis

c.Semantic analysis

d.Code generation

227).What is the purpose of the symbol table in a compiler?

A.To store the names and attributes of variables and functions

B.To perform type checking

C.To optimize the generated code

D. All

228).which algorithm is commonly used for parsing in a compiler?

a.Depth-first search

b.Breadth-first search

c.LR(1) parsing

d.LL(1) parsing

229)What is the purpose of the code generation phase in a compiler?

a.To perform memory allocation

b.To handle runtime errors

c.To optimize the generated code

d.To translate the intermediate representation into machine code

230).which of the following is a type of parser used in a compiler?

- a.All
- b.GLR parser
- c.Shift-reduce parser
- d.Recursive descent parser

231).what is the role of the lexical analyzer in a compiler?

- a.To perform type checking
- b.To perform syntax analysis
- c.To generate the parse tree
- d.To identify the basic language constructs (token)

232).what is the purpose of the semantic analysis phase in a compiler?

- a.To handle runtime errors
- b.To generate the intermediate representation
- c.To optimize the generated code
- d.To perform type checking and type conversion

233).Which of the following is an example of a type error in a program?

- a. Syntax error in an if-else statement.
- b. Division of a number by zero.
- c. Accessing an array element out of bounds.
- d. Incorrect indentation in the program.

234).Which of the following is an advantage of using type checking in a compiler?

- a. Improved program performance.
- b. Enhanced code optimization.
- c. Early detection of potential runtime errors.
- d. Simplified debugging process

235).What is the primary goal of type checking in a compiler?

- a. To ensure syntactic correctness of the program.
- b. To generate efficient machine code.
- c. To enforce programming language rules and constraints.
- d. To provide support for code reuse through libraries.

236). Which is considered as the sequence of characters in a token?

- A. Mexeme
- B. Lexeme
- C. Texeme
- D. Pattern

237). Which of the following component is important for semantic analysis?

- A. Yacc
- B. Lex
- C. Symbol Table
- D. Type Checking

238).. Keywords are recognized in a compiler during -

- A. the code generation
- B. the data flow analysis
- C. the lexical analysis of the program
- D. the program parsing

239). Leaf nodes in a parse tree indicate?

- A. sub-terminals
- B. half-terminals
- C. non-terminals
- D. terminals

240). In the compiler, the function of using intermediate code is:

- A. to improve the register allocation
- B. to increase the error reporting & recovery.
- C. to make semantic analysis easier.
- D. to increase the chances of re-using the machine-independent code optimizer in other compilers.

241). The compiler can detect what type of errors?

- A. neither logical nor grammatical error

- B. logical errors only
 - C. grammatical errors only
 - D. both grammatical and logical errors
- 242). Which of the following is used in various stages or phases of the compiler?
- A. Records
 - B. Program
 - C. Symbol Table
 - D. Table
- 243). The CLR compiles the source code of applications developed using .NET compliant languages into ____.
- A. Source code
 - B. MSIL
 - C. Bytecode
 - D. Machine code
- 244). Which of the following represents a dynamic semantic error?
- A. type mismatch
 - B. Missing semi-colon
 - C. illegal character
 - D. division by zero
- 245). When is the type checking usually done?
- A. During lexical analysis
 - B. During syntax analysis
 - C. During code optimization
 - D. During syntax directed translation
- 246). What is the purpose of semantic rules in syntax-directed translation?
- a. To define the syntactic structure of the language.
 - b. To assign types to the variables used in the program.
 - c. To perform optimization techniques on the intermediate code.
 - d. To define the order of evaluation of expressions.
- 247). All of the following can represent intermediate code except _____
- A. Syntax tree
 - B. Three address code
 - C. lexemes
 - D. Quadruples
- 248). The recognizer to syntax analysis is ____
- A. Deterministic finite automata
 - B. Non-deterministic finite automata
 - C. non-deterministic pushdown automata
 - D. deterministic push down automata
- 249). All of the following grammar types are implemented with predictive parser except _____
- A. Right recursive
 - B. Left recursive
 - C. deterministic
 - D. left-factored.
- 250). Which phase of the compiler is responsible for type checking?
- a. Lexical Analysis
 - b. Syntax Analysis
 - c. Semantic Analysis
 - d. Code Generation
- 251). Which of the following is NOT the primary role of code generator in compiler design? *
- A. instruction selection
 - B. Declaration of variables
 - C. instruction ordering
 - D. Register allocation
- 252). What is type checking in a compiler?
- a. Verifying the syntax of the program.

- b. Detecting lexical errors in the program.
 - c. Ensuring that the operations on variables are well-defined and compatible.
 - d. Generating the intermediate code for the program.
- 253). When is the type checking usually done? *
- A. During lexical analysis
 - B. During syntax directed translation
 - C. During syntax analysis
 - D. During code optimization
- 254). Which data structure is commonly used in symbol tables during the compilation process?
- a. Stack
 - b. Queue
 - c. Hash Table
 - d. Linked List
- 255). Which phase of the compiler performs optimization techniques to improve the efficiency of the generated code?
- a. Lexical Analysis
 - b. Syntax Analysis
 - c. Semantic Analysis
 - d. Code Optimization
- 256). Handle pruning is the technique used to obtain
- (A) Canonical reduction sequence
 - (B) Canonical derivation sequence
 - (C) Both (a) and (b)
 - (D) None of these
- 257). Which of the following is/are the phases of compiler?
- (A) Code generation
 - (B) Syntax analyser
 - (C) Lexical analyser
 - (D) All of these
- 258). Compiler translates the source code to
- (A) Machine code
 - (B) Executable code
 - (C) Binary code
 - (D) Both A and C
- 259). Replacement of an expensive operation by a cheaper one is called
- (A) Reduction in strength²
 - (B) Loop-invariant computation
 - (C) Code motion
 - (D) None of these
- 260). What is a compiler?
- A. system program that converts instructions to machine language
 - B. system program that converts machine language to high-level language
 - C. system program that writes instructions to perform
 - D. None of the mentioned
- 261). Who is responsible for the creation of the symbol table?
- A. Assembler
 - B. Compiler
 - C. Interpreter
 - D. All of the mentioned
- 262). Which of the following is an example of a static type checking technique?
- a. Type inference
 - b. Dynamic typing
 - c. Run-time type checking
 - d. Operator overloading
- 263). Which phase of the compiler generates the target code?
- a. Lexical Analysis

- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

264).What is the purpose of a type symbol table in a compiler?

- a. To store the types of variables used in the program.
- b. To store the names of variables used in the program.
- c. To store the intermediate code generated during parsing.
- d. To store the syntax rules of the programming language

265).What is a compiler?

- A. system program that converts source code to target code.
- B. system program that converts machine language to high-level language
- C. system program that writes instructions to for compilation
- D. system program that converts low-level language to high-level language

266). Which of the following is Not a phase of compiler design?

- A.Semantic analysis
- B.Intermediate code generator
- C. Code generator
- D. Interpreter

267). A process of replacing a variable name by choices on the right-hand side of grammar rules is:

- A. Derivation
- B. Flow graph
- C. Ambiguity
- D. Precedence

268). From the following list which one is not primary tasks of code generator?

- A. Register allocation
- B. instruction selection
- C. Variables declaration
- D. instruction ordering

269)..Which phase of the compiler is responsible for recognizing tokens and building a symbol table? a. Lexical Analysis

- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

270).What is the primary output of the lexical analysis phase?

- a. Abstract Syntax Tree (AST)
- b. Symbol Table
- c. Intermediate Code
- d. Assembly Code

271).Which phase of the compiler is responsible for checking the correctness of the program's structure? a. Lexical Analysis

- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

272).Which component of the compiler generates an Abstract Syntax Tree (AST)?

- a. Lexical Analyzer
- b. Parser
- c. Semantic Analyzer
- d. Code Generator

273).What does the semantic analysis phase of the compiler focus on?

- a. Identifying syntax errors
- b. Analyzing the meaning of program statements
- c. Generating intermediate code
- d. Translating source code to machine code

274).Which phase of the compiler performs type checking and enforces semantic rules?

- a. Lexical Analysis
- b. Syntax Analysis

- c. Semantic Analysis
- d. Code Generation.

275).Which phase of the compiler translates the intermediate representation into the target machine code?

- a. Lexical Analysis
- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

276).What is the primary goal of the code optimization phase in compiler design?

- a. To reduce the size of the source code
- b. To eliminate syntax errors
- c. To improve the performance of the generated code
- d. To generate human-readable code

277).the language processor translate the program into object code is

- A) linker
- B) debugger
- C) compiler
- D) interpreter

278).What is the purpose of semantic rules in a programming language?

- a. To define the syntax of the language
- b. To specify the order of execution of statements
- c. To enforce the correct use of language constructs
- d. To optimize the generated code

279).Which of the following is responsible for recognizing keywords and identifiers in a programming language?

- a. Lexical Analyzer
- b. Parser
- c. Semantic Analyzer
- d. Code Generator

280).What is the primary output of the lexical analysis phase?

- a. Abstract Syntax Tree (AST)
- b. Symbol Table
- c. Intermediate Code
- d. Assembly Code

281).Which phase of the compiler is responsible for checking the syntax of the program?

- a. Lexical Analysis
- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

282).Which component of the compiler constructs an Abstract Syntax Tree (AST)?

- a. Lexical Analyzer
- b. Parser
- c. Semantic Analyzer
- d. Code Generator

283).What is the main goal of the semantic analysis phase in compiler design?

- a. To check the syntax of the program
- b. To generate intermediate code
- c. To perform type checking and enforce semantic rules
- d. To translate the source code to machine code

284).Which phase of the compiler translates the intermediate representation into the target machine code?

- a. Lexical Analysis
- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

285).What is the purpose of an Abstract Syntax Tree (AST)?

- a. To store the program's symbol table

- b. To generate assembly code
- c. To visualize the program's control flow
- d. To represent the hierarchical structure of the program

286).What does the symbol table in a compiler store?

- a. Intermediate code
- b. Machine code
- c. Source code
- d. Information about identifiers and their attributes

287).Which phase of the compiler performs type checking?

- a. Lexical Analysis
- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

288).What is the purpose of intermediate code in compiler design?

- a. To optimize the program's execution
- b. To generate assembly code
- c. To represent the program's semantics in a platform-independent form
- d. To visualize the program's control flow

289).Which of the following is used to generate a lexical analyzer for a programming language?

- a. Finite Automaton
- b. Context-Free Grammar
- c. Pushdown Automaton
- d. Turing Machine

290).What is the purpose of a lexical analyzer in a compiler?

- a. To check the syntax of the program
- b. To generate intermediate code
- c. To perform type checking
- d. To recognize and tokenize the input source code

291).Which of the following is used to specify the lexical structure of a programming language?

- a. Regular Expressions
- b. Context-Free Grammars
- c. Backus-Naur Form (BNF)
- d. Abstract Syntax Trees (AST)

292).Which technique is used to handle nested parentheses in syntax analysis?

- a. LL Parsing
- b. LR Parsing
- c. Recursive Descent Parsing
- d. Operator Precedence Parsing

293).Which parsing technique builds the parse tree from the bottom-up?

- a. LL Parsing
- b. LR Parsing
- c. Recursive Descent Parsing
- d. Top-Down Parsing

294).Which technique is used to resolve shift-reduce conflicts in parsing?

- a. Precedence Parsing
- b. Operator Precedence Parsing
- c. LR Parsing
- d. LL Parsing

295).Which parsing technique uses a parsing table to determine the next action?

- a. LL Parsing
- b. LR Parsing
- c. Recursive Descent Parsing
- d. Top-Down Parsing

296).Which parsing technique is more suitable for handling left-recursive grammar rules?

- a. LL Parsing
- b. LR Parsing

- c. Recursive Descent Parsing
- d. Top-Down Parsing

297). Which of the following is not a top-down parsing algorithm?

- a. Recursive Descent Parsing
- b. LL Parsing
- c. Predictive Parsing
- d. LR Parsing

298). Which parsing technique is more suitable for handling ambiguous grammars?

- a. LL Parsing
- b. LR Parsing
- c. Recursive Descent Parsing
- d. Top-Down Parsing

299). Which technique is used to handle the ambiguity in the context-free grammar?

- a. Parsing
- b. Lexical analysis
- c. Semantic analysis
- d. Leftmost derivation

300). Which phase of the compiler analyzes the source code to identify the basic syntactic structures?

- a. Lexical Analysis
- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

301). Which phase of the compiler assigns meaning to the syntactic structures and performs type checking?

- a. Lexical Analysis
- b. Syntax Analysis
- c. Semantic Analysis
- d. Code Generation

302). Which of the following represents the correct order of compiler phases?

- a. Code Generation, Semantic Analysis, Lexical Analysis, Syntax Analysis
- b. Lexical Analysis, Syntax Analysis, Semantic Analysis, Code Generation
- c. Syntax Analysis, Lexical Analysis, Semantic Analysis, Code Generation
- d. Semantic Analysis, Syntax Analysis, Lexical Analysis, Code Generation

303). Which of the following is not a typical optimization performed by a compiler?

- a. Constant Folding
- b. Loop Unrolling
- c. Dead Code Elimination
- d. Syntax Analysis

304). Which of the following can NOT represent a target Code?

- A. Three address code
- B. Assembly language
- C. Absolute machine code
- D. Byte Code

Given input Alphabet $\Sigma = \{a, b, c, d\}$. Then, which one of the following is true about Σ^+ ?

- ☐ a. $\Sigma^1 \cap \Sigma^2 \cap \Sigma^3 \cap \Sigma^4 \cap \Sigma^5 \cap \dots$
- ☐ b. $\Sigma^0 \cap \Sigma^1 \cap \Sigma^2 \cap \Sigma^3 \cap \Sigma^4 \cap \dots$
- ☐ c. $\Sigma^0 \cup \Sigma^1 \cup \Sigma^2 \cup \Sigma^3 \cup \Sigma^4 \cup \dots$
- ☒ d. $\Sigma^1 \cup \Sigma^2 \cup \Sigma^3 \cup \Sigma^4 \cup \Sigma^5 \cup \dots$

[Clear my choice](#)

Which one of the following is false about any language L

☐ a. $L^3 = L^1 L^1 L^1$

☐ b. $L^0 = L$

☐ c. $L^* = L^0 UL^1 UL^2 UL^3 UL^4 U \dots$

☒ d. $L^+ = L^1 UL^2 UL^3 UL^4 UL^5 U \dots$

[Clear my choice](#)

Given input Alphabet $\Sigma = \{a, b, c, d\}$ and empty string λ . Then, which one of the following is equivalent to Σ^0 ??

☐ a. $\{\lambda\}$

☐ b. Σ^+

☐ c. Σ^*

☐ d. Σ

Question 7

Given input Alphabet $\Sigma = \{a, b, c, d\}$ and empty string λ . Then, which one of the following is true about Σ^* ?

- ☐ a. $\Sigma^* = \Sigma^+ \cup \{\lambda\}$
- ☐ b. $\Sigma^* = \Sigma^1 \cup \Sigma^2 \cup \Sigma^3 \cup \Sigma^4$
- ☐ c. $\Sigma^* = \{\lambda\}$
- ☐ d. $\Sigma^* = \Sigma^+$

1) = A✓	101)=C	201)=B✓
2) =B✓	102)=C	202) =C✓
3) =B✓	103)=D	203) =A✓
4) =D✓	104)=D✓	204) =D✓
5) =B✓	105)=A✓	205) =C✓
6) =C✓	106)=D✓	206) =A✓
7) = B✓	107)=C	207) =C✓
8) =C✓	108)=A	208) =D✓
9) =B✓	109)=B	209) =B✓
10)=D✓	110)=B ³	210) =B✓
11)=C✓	111)=B✓	211) =B✓
12)=A✓	112)=D✓	212) =C✓
13)=C✓	113)=C✓	213) =C✓
14)=B✓	114)=B✓	214) =D✓
15)=C	115)=C✓	215) =C✓
16)=A	116)=D✓	216) =B✓
17)=B✓	117)=C✓	217) =A✓
18)=D✓	118)=A✓	218) =C✓
19)=C✓	119)=A✓	219) =A✓

20)=B✓	120)=B✓	220) =C✓
21)=A✓	121)=C	221) =B✓
22)=D✓	122)=C✓	222) =A✓
23)=A✓	123)=A✓	223) =C✓
24)=B✓	124)=C	224) =B
25)=C✓	125)=C✓	225) =B✓
26)=C✓	126)=A✓	226) =B✓
27)=B✓	127)=A✓	227) =A✓
28)=C✓	128)=D	228) =C✓
29)=D✓	129)=D✓	229) =D
30)=D✓	130)=D✓	230) =B✓
31)=A✓	131)=B✓	231) =D✓
32)=B✓	132)=A✓	232) =D✓
33)=C✓	133)=A ✓	233) =B✓
34)=D✓	134)=C✓	234) =C✓
35)=A✓	135)=B✓	235) =A ✓
36)=D✓	136)=B✓	236) =B✓
37)=A✓	137)=C✓ ₃	237) =D✓
38) =A✓	138)=C✓	238)= C✓
39) =B	139)=D✓	239)=D✓
40) =B✓	140)=B✓	240) =D✓
41) =A✓	141)=A✓	241)=C✓
42) =D✓	142)=B	242) =C✓
43) =C✓	143)=D✓	243) =B✓
44) =C✓	144)=D✓	244) =D
45) =A✓	145)=B✓	245)=D
46) =A	146)=A✓	246)=B✓
47) =B	147)=C✓	247)=D✓
48) =C	148)=A✓	248)=D
49) =B✓	149)=C✓	249)=B
50) =C✓	150)=B✓	250)=B✓
51)=A	151)=B	
52)=C	152)=A	251=B
53)=D	153)=A	252=C
54)=B	154)=C	253=B
55)=D	155)=B	254=C
56)=C	156)=B	255=D
57)=A	157)=D	256=A

58)=C	158)=B	257)=D
59)=C	159)=A	258)=D
60)=A	160)=A	259)=A
61)=D	161)=B	260)=A
62)=B	162)=C	261)=B
63)=D	163)=D	262)=A
64)=B	164)=A	263)=D
65)=A	165)=A	264)=B
66)=C	166)=D	265)=A
67)=B	167)=B	266)=D
68)=C	168)=D	267)=A
69)=B	169)=B	268)=C
70)=B	170)=A	269)=A
71)=E	171)=C	270)=A
72)=D	172)=B	271)=B
73)=C	173)=A	272)=B
74)=A	174)=B	273)=B
75)=C	175)=B	274)=C
76)=C	176)=C	275)=D
77)=A	177)=A	276)=C
78)=A	178)=D	277)=C
79)=C	179)=C	278)=A
80)=C	180)=C	279)=A
81)=B	181)=A	280)=B
82)=A	182)=B	281)=B
83)=C	183)=B	282)=B
84)=D	184)=C	283)=C
85)=D	185)=A	284)=D
86)=D	186)=B	285)=D
87)=D	187)=C	286)=D
88)=B	188)=A	287)=B
89)=A	189)=C	288)=C
90)=C	190)=D	289)=A
91)=C	191)=A	290)=D
92)=D	192)= C 3	291)=A
93)=A	193)=B	292)=C
94)=A	194)=C	293)=B
95)=A	195)=B	294)=B
96)=B	196)=A	295)=C
97)=C	197)=D	296)=D
98)=C	198)=A	297)=D
99)=D	199)=A	298)=B
100)=B	200)=D	299)=A
		300)=A
		301)=C
		302)=B
		303)=D
		304)=B
		305)=D
		306)=B
		307)=A
		308)=A
		309)=