

- 1) Which of the following best describes the useful criterion for comparing the efficiency of algorithms?
 (a).Time (b).Memory (c).Both of the above (d).None of the above
- 2) Which is the option that gives the increasing order of asymptotic complexity of functions f_1 , f_2 , f_3 and f_4 ?
 a) $f_1(n)=2n$
 b) $f_2(n)=n^3/2$
 c) $f_3(n)=n\log n$
 d) $f_4(n)=n\log n$
 (a).b,c,d,a (b).c,b,d,a (c).b,c,a,d (d).d,a,c,b
- 3) The data structure required for Breadth First Traversal on a graph is-----
- 4) Queues serve major role in _____
 (a). Simulation of recursion
 (b). Simulation of arbitrary linked list
 (c). Simulation of limited resource allocation
 (d).Simulation of heap sort
- 5). Double-ended queue supports operations such as adding and removing items from both the sides of the queue. They support four operations like addFr (adding item to the top of the queue), addRear(adding item to the bottom of the queue), removeFront(removing item from the top of the queue). You are given only stacks to implement this data structure. You can implement only push and pop operations. What operation?(you can reuse the stack)
 (a).1
 (b).2
 (c). 3
 (d). 4
6. You are asked to perform a queue operation using a stack. Assume the size of the stack is some value 'n' and there are 'm' number of variables in this stack. The time complexity of performing deQueue operation is -----(Using only stack operations like push and pop)(Tightly bound).
- 7 Consider you have an array of some random size. You need to perform dequeue operation. You can perform it using stack operation (push and pop) or using queue operations itself (enqueue and Dequeue). The output is guaranteed to be same. Find some differences?
- 8 What is the value of the postfix expression $6\ 3\ 2\ 4\ +\ -\ *?$
- 9 A double-ended queue supports operations like adding and removing items from both the sides of the queue. They support four operations like addFront(adding item to top of the queue), addRear(adding item to the bottom of the queue), removeFront(removing item from the top of the queue) and removeRear(removing item from the bottom of the queue). You are given only stacks to implement this data structure. You can implement only push and pop operations.

What's the time complexity of performing addFront and addRear? (Assume 'm' to be the size of the stack and 'n' to be the number of elements)

10 Why is implementation of stack operations on queues not feasible for a large dataset (Assume the number of elements in the stack to be n)?

11 What is the worst case for linear search?

12 Which of the following is a disadvantage of linear search?

13 The complexity of binary search algorithm is

14 What is the need for a circular queue?

15 Which of the following best describes a logical record in a database?

(a).The actual physical storage of data on disk (b).A collection of related data items treated as a unit at the logical level (c).A block of records stored together for efficient retrieval (d).The structure of an index in a database

16 If the size of a record is 200 bytes and the block size is 4000 bytes, what is the blocking factor (number of records per block)?

17 In a buffer management system, a pinned record is:

(a).A record that is locked for concurrent transactions (b).A record that cannot be moved from memory to disk temporarily (c).A record that is indexed in a database (d).A record stored in multiple blocks

18 In a single-level index, if a database has 100,000 records and a block can store 100 index entries, how many index blocks are needed?

19 In a B-Tree of order 4, what is the maximum number of keys a node can have?

20 In a B+ Tree, the number of keys in a leaf node is always:

(a).Less than the number of pointers (b).Equal to the number of pointers (c).Greater than the number of pointers (d).Unrelated to the number of pointers

21 Which of the following is true about heap files?

(a).Records are stored in a sorted order (b).Searching for a record in a heap file is very efficient (c).New records are inserted at the end of the file (d).Heap files require indexing to store data

22 In a file with 10,000 records, stored using single-level indexing, how many index entries are needed if each index entry points to a block storing 100 records?

23 Which of the following statements about Extendible Hashing is FALSE?

(a).It is a dynamic hashing technique. (b).It allows bucket expansion dynamically. (c).It eliminates overflow chains found in static hashing. (d).It requires a fixed directory size.

24 A disk block contains 512 bytes, and each record is 64 bytes. How many records can be stored in one block?

25 Which of the following ACID properties ensures that a transaction either fully executes or has no effect at all?

(a).Atomicity (b).Consistency (c).Isolation (d).Durability

26 Which of the following is NOT a valid transaction state?

- (a).Active (b).Partially Committed (c).Aborted (d).Unstable
- 27 Which of the following is NOT a concurrency control technique?
- (a).Two-Phase Locking (b).Time-Stamp Ordering (c).Log-Based Recovery
(d).Multiversion Concurrency Control
- 28 In Strict Two-Phase Locking (Strict 2PL), when are locks released?
- 29 Which of the following requires both undo and redo operations during recovery?
- (a).Deferred Write (b).Immediate Write (c).Shadow Paging (d).Write-Ahead Logging (WAL)
- 30 How does Cassandra distribute data across nodes?
- 31 Graph databases like ArangoDB are best suited for-----
- 32 Which type of indexing is used in ArangoDB for fast lookups?
- 33 Which of the following schedules is always serializable?
- (a).Conflict-equivalent schedules (b).Cascading schedules (c).Schedules that follow Strict Two-Phase Locking (d).Blind Write Schedules
- 34 Which of the following represents a basic data model in a Graph Database like ArangoDB?
- (a).Tables and Rows (b).Key-Value Pairs (c).Nodes and Edges (d).JSON Documents
- 35 Two schedules S1 and S2 are conflict-equivalent if:
- (a).They have the same set of transactions. (b).They have the same transactions and conflicting operations in the same order. (c).They have the same execution time. (d).They have the same number of committed transactions.
- 36 A schedule is conflict-serializable if:
- (a).It has no conflicting operations. (b).It is conflict-equivalent to some serial schedule. (c).It contains no deadlocks. (d).It follows strict 2PL.
- 37 A schedule is recoverable if:
- (a).Transactions commit before writing to the database. (b).Transactions commit only after all transactions whose data they read have committed. (c).Transactions never rollback. (d).Transactions execute in serial order.
- 38 In Strict 2PL, when are locks released?
- 39 Which of the following is NOT a deadlock prevention technique?
- (a).Wait-Die (b).Wound-Wait (c).Timestamp Ordering (d).Cascading Rollback
- 40 In Deferred Database Modification, changes made by a transaction are:
- (a).Written to the database immediately. (b).Written only after the transaction commits. (c).Applied after every operation. (d).Applied based on a locking mechanism.
- 41 Which of the following is NOT a characteristic of NoSQL databases?
- (a).Schema-less design (b).Horizontal scalability (c).Support for complex joins (d).High availability
- 42 Which of the following databases is a Key-Value store?
- (a).Redis (b).MongoDB (c).Cassandra (d).MySQL
- 43 Which of the following databases is a document-oriented NoSQL database?

(a).Redis (b).MongoDB (c).PostgreSQL (d).Cassandra

44 What is Sharding in MongoDB?

45 The Myhill-Nerode relation is used to -----

46 What does the Myhill-Nerode theorem conclude about regular languages?

47 A language L is not regular if its Myhill-Nerode relation has:

- (a).Infinite equivalence classes (b).Finite equivalence classes
(c).A DFA representation (d).None of the above

48 Which of the following statements is true regarding the Myhill-Nerode theorem?

- (a).It is used to determine whether a language is context-free (b).It is used to minimize a DFA.
(c).It is used to check ambiguity in a grammar. (d).It is used to determine whether a language is regular

49 Consider a language L over $\Sigma=\{0,1\}$ such that L contains all strings ending with "01". How many equivalence classes does L have under the Myhill-Nerode relation?

50 The number of equivalence classes in the Myhill-Nerode relation for a regular language corresponds to:-----

51 Which of the following languages is not regular, based on the Myhill-Nerode theorem?

- (a). $L=\{a^n b^n \mid n \geq 0\}$ (b). $L=\{a^n b^m \mid n, m \geq 0\}$
(c). $L=\{W \mid W \text{ end with } ab\}$ (d). $L=\{W \mid W \text{ contains even number of } a\text{'s}\}$

52 Given the language $L=\{0^n 1^n \mid n \geq 0\}$ identify why it is not regular using the Myhill-Nerode theorem

- (a).It has finite equivalence classes. (b).It has infinitely many equivalence classes.
(c).It cannot be represented by a DFA. (d).Both B and C are correct

53 Which of the following statements is true regarding the Myhill-Nerode equivalence relation for a regular language L?

- (a).Every two strings in the same equivalence class are guaranteed to be of the same length.
(b).wo strings u and v are in the same equivalence class if appending the same string w gives either both uw, vw together (c).both A and B (d).none of the above

54 Given $L=\{w \mid w \text{ contains an even number of } 0\text{'s}\}$ how many equivalence classes are defined by the Myhill-Nerode relation?

55 Which of the following is true about Context-Free Grammars (CFGs)

- (a).Every regular language is also context-free (b).Every context-free language is also regular
(c).CFGs can only define infinite languages (d).CFGs cannot be converted into a PDA

56 Which of the following productions violates the Chomsky Normal Form (CNF)?

- (a). $A \rightarrow BC$ (b). $A \rightarrow a$ (c). $A \rightarrow \epsilon$ (d).Both B and C

57 A CFG is said to be ambiguous if -----

58 For the language $L=\{a^n b^n c^n \mid n \geq 1\}$ a CFG representation would be

- (a). $S \rightarrow aSb \mid \epsilon$ (b). $S \rightarrow aSbC$, $C \rightarrow Cc \mid \epsilon$ (c). $S \rightarrow aSb \mid abC$ (d).None of the above

59 Which of the following is true about Greibach Normal Form (GNF)?

- (a).GNF allows ϵ -productions (b).All production rules start with a non-terminal
 (c).All production rules start with a terminal (d).GNF can only represent finite languages

60 The derivation tree for the CFG $S \rightarrow aSb \mid \epsilon S$ shows

- (a).The leftmost derivation of a string (b).The rightmost derivation of a string
 (c).The structure of how the grammar generates a string (d).All possible derivations of the grammar

61 Which of the following is an example of an ambiguous grammar?

- (a). $S \rightarrow aSb \mid \epsilon$ (b). $S \rightarrow SS \mid (S) \mid \epsilon$ (c). $S \rightarrow aSbb \mid ab$ (d). $S \rightarrow aSbC, C \rightarrow cC \mid \epsilon$

62 Which of the following languages can be represented using a CFG?

- (a). $L = \{a^n b^n c^n \mid n \geq 1\}$ (b). $L = \{a^n b^n \mid n \geq 0\}$ (c). $L = \{ww^R \mid w \in \{a,b\}^*\}$ (d).None of the above

63 Let G_1, G_2 be Context free Grammars (CFGs) and R be Regular expression For a Grammar G , let $L(G)$ denote the language generated G which ONE among uestion is decidable

- (a).Is $L(G_1) = L(G_2)$? (b).Is $L(G_1) \cap L(G_2) = \emptyset$? (c).Is $L(G_1) = L(R)$? (d).Is $L(G_1) = \emptyset$?

64 Consider the following context-free grammar G , where S, A , and B are the variables (non-terminals), a and b are the terminal symbols, S is the start variable, and the rules of G are described as: $S \rightarrow aaB \mid Abb$ $A \rightarrow a \mid aA$ $B \rightarrow b \mid bB$ Which ONE of the languages $L(G)$ is accepted by G ?

- (a). $L(G) = \{a^{2n} b^n \mid n \geq 1\} \cup \{a^n b^{2n} \mid n \geq 1\}$
 (b). $L(G) = \{a^n b^{2n} \mid n \geq 1\} \cup \{a^{2n} b^n \mid n \geq 1\}$
 (c). $L(G) = \{a^n b^n \mid n \geq 1\}$
 (d). $L(G) = \{a^{2n} b^{2n} \mid n \geq 1\}$

65 What is the main limitation of a deterministic Pushdown Automaton (DPDA)?

66 Consider the language L_1, L_2 and L_3 are given below :

$L_1 = \{0^p 1^q \mid p, q \in \mathbb{N}\}$,

$L_2 = \{0^p 1^q \mid p, q \in \mathbb{N} \text{ and } p = q\}$ and

$L_3 = \{0^p 1^q 0^r \mid p, q, r \in \mathbb{N} \text{ and } p = q = r\}$ which of he following statement is true

- (a).Push down automata can be used to recognize L_1 and L_2 (b). L_1 is regular language
 (c).All the three languages are context free (d).Turing machine can be used to recognize all the languages

67 Let L be a set accepted by a non deterministic finite automaton. The number of states in non-deterministic finite automaton is $|Q|$. The maximum number of states in equivalent finite automaton that accepts L is -----

68 The minimum number of states of the non-deterministic finite automation which accepts the language $\{abab^n \mid n \geq 0\} \cup \{aban \mid n \geq 0\}$ is-----

69 The pushdown automation $M = (\{q_0, q_1, q_2\}, \{a, b\}, \{0, 1\}, \delta, q_0, 0, \{q_0\})$ with

$\delta(q_0, a, 0) = \{(q_1, 10)\}$;

$\delta(q_1, a, 1) = \{(q_1, 11)\}$;

$\delta(q_1, b, 1) = \{(q_2, \lambda)\}$;

$\delta(q_2, b, 1) = \{(q_2, \lambda)\}$;

$\delta(q_2, A, 0) = \{(q_0, \lambda)\}$ accept the language

(a). $L = \{a^n b^m | n, m \geq 0\}$ (b). $L = \{a^n b^m | n, m > 0\}$ (c). $L = \{a^n b^n | n > 0\}$ (d). $L = \{a^n b^n | n \geq 0\}$

70 Given the following two languages: $L_1 = \{a^n b^n | n \geq 0, n \neq 100\}$ $L_2 = \{w \in \{a, b, c\}^* | n_a(w) = n_b(w) = n_c(w)\}$ Which of the following options is correct?

(a). Both L_1 and L_2 are Context free (b). Both L_1 and L_2 are not Context free

(c). L_1 is context free and L_2 is not context free (d). L_1 is not context free and L_2 is context free

71 Given the following two statements: A. $L = \{w | n_a(w) = n_b(w)\}$ is deterministic context free language, but not linear. B. $L = \{a^n b^n\} \cup \{a^n b^{2n}\}$ is linear, but not deterministic context free language. Which of the following options is correct?

(a). Both A and B are true (b). Both A and B are not true

(c). A is true and b is false (d). A is false and B is true

72 Which of the following languages can be accepted by a Nondeterministic Pushdown Automaton (PDA) but not by a Deterministic Pushdown Automaton (DPDA)?

(a). Regular languages (b). Context-free languages with ambiguous grammars

(c). Deterministic context-free languages (d). All context-free languages

73 What is the key feature of a PDA that differentiates it from a Finite Automaton?

74 Why do Deterministic Pushdown Automata (DPDA) fail to recognize some Context-Free Languages (CFLs)?

75 Which of the following is true about the Pumping Lemma for Context-Free Languages?

(a). It is used to prove that a language is context-free

(b). It is used to prove that a language is not context-free

(c). It is used to prove that a language is regular.

(d). None of the above.

76 If L_1 and L_2 are Context-Free Languages, which of the following operations results in a language that is guaranteed to be Context-Free?

(a). Intersection of L_1 and L_2

(b). Complement of L_1

(c). Union of L_1 and L_2

(d). None of the above.

77 What is the role of a stack in establishing the equivalence of PDAs and CFGs?

78 Let $L_1 = \{a^n b^n | n \geq 0\}$ and $L_2 = \{b^n a^n | n \geq 0\}$. What is $L_1 \cap L_2$, and is it a Context-Free Language?

(a). $L_1 \cap L_2 = \{a^n b^n | n \geq 0\}$ and it is context-free. (b). $L_1 \cap L_2 = \{b^n a^n | n \geq 0\}$ and it is context-free. (c). $L_1 \cap L_2 = \emptyset$ and it is context-free (d). $L_1 \cap L_2 = \{\}$, and it is not context-free.

79 $S \rightarrow aSa | bSb | a | b$; The language generated by the above grammar over the alphabet $\{a, b\}$ is -----

80 Given Grammar G_1 :

$S \rightarrow aSb$

$S \rightarrow e$

Grammar G2:

$R \rightarrow cRd$

$R \rightarrow e$

If $L(G) = L(G1) \cup L(G2)$, the number of productions the new starting variable would have:

81 Context free languages are not closed under:

- (a).Intersection (b).Intersection with Regular Language
(c).Complement (d).All of the mentioned

82 There is a linear grammar that generates a context free grammar

- (a).always (b).never (c).sometimes (d).none of the mentioned

83 For the expression $E^*(E)$ where $*$ and brackets are the operation, number of nodes in the respective parse tree are -----

84 Which of the following languages are most suitable for implement context free languages ?

- (a).c (b).perl (c).Assembly language (d).none of the above

85 $L = \{0^i 1^j 2^k \mid j > i + k\}$

Which of the following satisfies the language?

- (a).0111100 (b).011100 (c).0001100 (d).0101010

86 Context-free grammar can be recognized by

- (a).finite state automation (b).2- way linear bounded automata (c).push down automata
(d).None of the above

87 Context sensitive grammar (CSL) is also called?

- (a).Length increasing grammar (b).Non contracting Grammar
(c).Type 1 Grammar (d).All of the above

88 Which of the following is Type 1 language or Type 1 grammar?

- (a).Regular grammar/ Regular language
(b). Context Free Grammar / Context Free language
(c).Context Sensitive Grammar / Context Sensitive language
(d). Recursively Enumerable

89 Which of the following Machine is specific for Context sensitive grammar?

- (a).Finite state automata (b).Push down automata
(c).Linear bound automata (d).Turing machine

90 Consider the following CSG.

$S \rightarrow abc/aAbc$

$Ab \rightarrow bA$

$Ac \rightarrow Bbcc$

$bB \rightarrow Bb$

$aB \rightarrow aa/aaA$

What is the language generated by this grammar?

- (a). $L = \{anbncn \mid n \geq 1\}$. (b). $L = \{anbncn \mid n \geq 0\}$ (c). $L = \{anbncn \mid n = 0\}$ (d). $L = \{anbncn \mid n > 1\}$

91 Which theoretical construct is essential for defining the computational power of LBAs?

92 The maximum yield length of following CNF CFG is -----

$S \rightarrow AB$

$A \rightarrow CD$

$B \rightarrow e$

$C \rightarrow a$

$B \rightarrow d$

93 Consider the following grammar G1

$S \rightarrow OSO \mid ISI \mid 0 \mid 1 \mid \epsilon$

and following G2

$S \rightarrow as \mid asb \mid X$

$X \rightarrow Xa \mid a$ Which of following is true

(a).G1 ambiguous and G2 Unambiguous (b).G1 Unambiguous and G2 ambiguous

(c).Both G1 and G2 Unambiguous (d).Both G1 and G2 ambiguous

94 While converting a CFG to LL(1) grammar, which of the following is true?

(a).Remove left recursion alone

(b).Factoring grammar alone

(c).Both of the above

(d). None of the above

95 given the grammar

$E \rightarrow E * F \mid F + E \mid F$

$F \rightarrow F - F \mid id$ which of following is true

(a).* has higher precedence than +

(b). - has higher precedence than *

(c).+ and - have the same precedence

(d). + has higher precedence than *

96 Which of the following best describes the role of a Turing machine in the context of language recognition?

(a).It recognizes all regular languages. (b). It recognizes all context-free languages.

(c).It recognizes all recursively enumerable languages. (d).It recognizes all context-sensitive languages.

97 Which aspect of a Turing machine allows it to act as a transducer?

98 Which property distinguishes a Turing machine from other automata in terms of computational power?

99 What is the primary limitation of Turing machines in practical computation, despite their theoretical power?

100 Let $\langle M \rangle$ be the encoding of a Turing machine as a string over $\{0,1\}$. Let $L = \{\langle m \rangle \mid M \text{ is a Turing machine that accepts a string of length } 2014\}$. Then, L is

- (a).decidable and recursively enumerable (b).Undecidable and recursively enumerable
(c).Undecidable and not recursively enumerable (d).Decidable and recursively enumerable

101 A which of the following is true for the language $L = \{ap \mid p \text{ is a prime}\}$

- (a).It is not accepted by a Turing Machine (b).It is regular but not Context free
(c).It is context free but not regular (d).It is neither regular nor context free but accepted by a Turing machine

102 Consider the following sets:

S1. Set of all recursively enumerable languages over the alphabet $[0,1]$

S2. Set of all syntactically Valid C programs

S3 Set of all languages over the alphabet $[0,1]$

S4 Set of all non regular languages over the alphabet $[0,1]$, which above are uncountable

- (a).S1 and S4 (b).S2 and S3 (c).S1 and S4 (d).S3 and S4

103 The problems which have no algorithm, regardless of whether or not they are accepted by a Turing machine that fails to halt on some input are referred as: —————

104 Nobody knows yet if $P=NP$. Consider the language L defined as follows

$L = \{(0+1)^* \mid \text{if } P=NP ; \emptyset \text{ otherwise}\}$, Which of the following statements is true

- (a). L is recursive (b). L is recursively enumerable but not recursive (c). L is not recursively enumerable
(d).whether L is recursive or not will be known after we find out if $P=NP$

105 Which functional unit is responsible for performing arithmetic and logic operations?

- (a).Control Unit (b).Memory Unit (c).ALU (Arithmetic Logic Unit) (d).I/O Unit

106 The correct sequence of the basic operational cycle in a CPU is:

- (a). Decode \rightarrow Fetch \rightarrow Execute (b). Execute \rightarrow Fetch \rightarrow Decode (c).Fetch \rightarrow Decode \rightarrow Execute (d). Fetch \rightarrow Execute \rightarrow Decode

107 What is the primary function of the address bus in a bus structure?

108 During a memory read operation, what does the CPU perform the first step?

109 During a memory read operation, what does the CPU perform the first step?

110 Which component of an instruction specifies the operation to be performed?

- (a).Operand (b).Opcode (c).Address Bus (d).Accumulator

111 Which addressing mode directly provides the operand within the instruction itself? (a).

- Direct Addressing (b).Immediate Addressing (c). Indirect Addressing (d). Indexed Addressing

- 112 The program counter (PC) in a CPU is primarily used to:
- 113 Which bus carries control signals like "Read" and "Write"?
- 114 In indirect addressing mode, the operand address is obtained from:
- 115 What is the correct sequence of stages in the instruction cycle?
- 116 Which register holds the address of the next instruction to be fetched?
- 117 During the "fetch" phase of the instruction cycle, which bus transfers the instruction from memory to the CPU?
- 118 In a single-bus organization, why might performance be limited?
- 119 What is the role of the MAR (Memory Address Register)?
- 120 Which phase of the instruction cycle involves fetching operands from memory?
- 121 Which component generates control signals to coordinate operations in the CPU?
- 122 What is a key advantage of multiple-bus organization over single-bus?
- 123 In a "LOAD R1, [2000]" instruction, what does the address 2000 represent?
- 124 Which step is NOT part of executing a complete arithmetic instruction (e.g., ADD)?
- 125 In Register Transfer Logic (RTL), the notation $R1 \leftarrow R2 + R3$ represents:
- 126 Which micro-operation is used to perform a bitwise right shift while preserving the sign bit?
- 127 The RTL statement $R1 \leftarrow R2 \cdot R1 \leftarrow R2$ corresponds to:
- 128 arithmetic micro-operations
- 129 A circular right shift operation on a register RR would:
- 130 The micro-operation $R1 \leftarrow R2$ is an example of:

- 131 Which arithmetic micro-operation is equivalent to decrementing a register?
- 132 What does the RTL statement $R3 \leftarrow \text{shl}(R3)$ accomplish?
- 133 The 2's complement subtraction $R1 \leftarrow R2 - R3$
- 134 Which shift operation fills the vacant bit with zero?
- 135 Which component coordinates activities between the ALU, memory, and I/O devices?
- 136 Which operation is NOT performed by the ALU?
- 137 In a ripple-carry adder, the carry-out of each full adder is connected to:
- 138 A circuit to compute XOR of two inputs can be directly implemented using:
- 139 In accumulator-based processor designs, the accumulator primarily serves to:
- 140 Which component generates control signals to coordinate data flow between the ALU, registers, and memory?
- 141 The design of a 4-bit arithmetic circuit requires which of the following as a fundamental building block?
- 142 Which status register flag is set when the result of an arithmetic operation exceeds the system's word size?
- 143 In ALU design, multiplexers are primarily used to:
- 144 In the restoring division algorithm, what happens if the partial remainder becomes negative after subtraction?
- 145 What is the primary advantage of Booth's multiplication algorithm?
- 146 In an array multiplier for 4-bit numbers, how many AND gates are required to generate partial products?
- 147 During Booth's algorithm, how are multiplier bits examined?
- 148 Which step is NOT part of the restoring division process?
- 149 What is the key drawback of an array multiplier?
- 150 How many iterations are required for restoring division of an n-bit divisor?
- 151 Which component is NOT part of an array multiplier?
- 152 Booth's algorithm is particularly efficient for multiplying which of the following binary numbers?
- 153 Which of the following statements is false?
- (a). The Halting Problem of Turing machines is undecidable
 - (b). Determining whether a context-free grammar is ambiguous is undecidable
 - (c). Given two arbitrary context-free grammars G_1 and G_2 it is undecidable whether $L(G_1) = L(G_2)$
 - (d). Given two regular grammars G_1 and G_2 it is undecidable whether $L(G_1) = L(G_2)$

(a).L is recursive (b).L is recursively enumerable but not recursive (c).L is not recursively enumerable (d).whether L is recursive or not will be known after we find out if $P=NP$

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Which of the following statements is false?

(a).

The Halting Problem of Turing machines is undecidable

(b).

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(c).

Given two arbitrary context-free grammars G_1 and G_2 it is undecidable whether $L(G_1)=L(G_2)$

(d).

Given two regular grammars G_1 and G_2 it is undecidable whether $L(G_1)=L(G_2)$

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