Multiple Choice Questions & Answers (MCQs) focuses on "Chomsky Normal Form".

1. The format: A->aB refers to which of the following?
a) Chomsky Normal Form
b) Greibach Normal Form
c) Backus Naur Form
d) None of the mentioned
View Answer

Answer: b
Explanation: A context free grammar is in Greibach Normal Form if the right hand sides of all the production rules start with a terminal, optionally followed by some variables.

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2. Which of the following does not have left recursions?
a) Chomsky Normal Form
b) Greibach Normal Form
c) Backus Naur Form
d) All of the mentioned
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Answer: b
Explanation: The normal form is of the format:
A->aB where the right hand side production tends to begin with a terminal symbo, thus having no left recursions.

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3. Every grammar in Chomsky Normal Form is:
a) regular
b) context sensitive
c) context free
d) all of the mentioned
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Answer: c
Explanation: Conversely, every context frr grammar can be converted into Chomsky Normal form and to other forms.

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4. Which of the production rule can be accepted by Chomsky grammar?
a) A->BC
b) A->a
c) S->e
d) All of the mentioned
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Answer: d
Explanation: in CNF, the production rules are of the form:
A->BC
A-> a
S->e

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5. Given grammar G:
(1)S->AS
(2)S->AAS
(3)A->SA
(4)A->aa
Which of the following productions denies the format of Chomsky Normal Form?
a) 2,4
b) 1,3
c) 1, 2, 3, 4
d) 2, 3, 4
View Answer

Answer: a
Explanation: The correct format: A->BC, A->a, X->e.

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6. Which of the following grammars are in Chomsky Normal Form:
a) S->AB|BC|CD, A->0, B->1, C->2, D->3
b) S->AB, S->BCA|0|1|2|3
c) S->ABa, A->aab, B->Ac
d) All of the mentioned
View Answer

Answer: a
Explanation: We can eliminate the options on the basis of the format we are aware of: A->BC, B->b and so on.

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7. With reference to the process of conversion of a context free grammar to CNF, the number of variables to be introduced for the terminals are:
S->ABa
A->aab
B->Ac
a) 3
b) 4
c) 2
d) 5
View Answer

Answer: a
Explanation: According to the number of terminals present in the grammar, we need the corresponding that number of terminal variables while conversion.

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8. In which of the following, does the CNF conversion find its use?
a) CYK Algorithm
b) Bottom up parsing
c) Preprocessing step in some algorithms
d) All of the mentioned
View Answer

Answer: d

Explanation: Besides the theoretical significance of CNF, it conversion scheme is helpful in algorithms as a preprocessing step, CYK algorithms and the bottom up parsing of context free grammars.

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9. Let G be a grammar. When the production in G satisfy certain restrictions, then G is said to be in ___________.

a) restricted form
b) parsed form
c) normal form
d) all of the mentioned

View Answer

Answer: c

Explanation: When the production in G satisfy certain restrictions, then G is said to be in 'normal form'.

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10. Let G be a grammar: S->AB|e, A->a, B->b

Is the given grammar in CNF?

a) Yes
b) No

View Answer

Answer: a

Explanation: e is allowed in CNF only if the starting variable does not occur on the right hand side of the derivation.

1.	Given the following expressions of a grammar E --> E * F / F + E / F F --> F - F / id Which of the following is true ?
a.	* has higher precedence than +
b.	- has higher precedence than *
c.	+ and - have same precedence
d.	+ has higher precedence than *

Answer: (b).- has higher precedence than *

4.	The grammar 'G1' S ---> OSO| ISI | 0|1|∊ and the grammar 'G2' is S ---> as |asb| X, X -----> Xa | a. Which is the correct statement ?
a.	G1 is ambiguous, G2 is unambiguous
b.	G1 is unambiguous, G2 is ambiguous
c.	Both G1 and G2 are ambiguous
d.	Both G1 and G2 are unambiguous

Answer: (b).G1 is unambiguous, G2 is ambiguous

	Which of the following regular expression identities are true ?
a.	(r + s)* = r* s*
b.	(r + s)* = r* + s*
c.	(r + s)* = (r*s*)*
d.	r* s* = r* + s*

Answer: (c).(r + s)* = (r*s*)*

	Which of the following definitions generates the same Language as L, where L = {WWR | W ∈ {a, b}*}
a.	S ∈ asb|bsa|∈
b.	S ∈ asa|bsb|∈
c.	S ∈ asb|bsa|asa|bsb|∈
d.	S ∈ asb|bsa|asa|bsb

Answer: (b).S ∈ asa|bsb|∈

	If the parse tree of a word w generated by a Chomsky normal form grammar has no path of length greater than i, then the word w is of length
a.	no greater than 2^(i+1)
b.	no greater than 2^i
c.	no greater than 2^(i–1)
d.	no greater than i

Answer: (c).no greater than 2^(i–1)

	The context free grammar for the language L= {anbm | n ≤ m+3,n ≥ 0 ,m≥ 0 } : is
a.	S → aaa; A → aAb | B, B → Bb | λ
b.	S → aaaA | λ ; A → aAb | B; B → Bb | λ ;
c.	S → aaaA | aaA | λ ; A → aAb | B; B → Bb | λ ;
d.	S → aaaA | aaA | aA | λ ; A → aAb | B; B → Bb | λ ;

Answer: (c).S → aaaA | aaA | λ ; A → aAb | B; B → Bb | λ ;

	Given the following statements. S1: The grammars S → asb | bsa |ss I a and s→ asb | bsa| a are not equivalent. S2: The grammars S→. ss| sss | asb | bsa| λ and S → ss |asb |bsa| λ are equivalent. Which of the following is true?
a.	Sl is correct anet S2 is not correct
b.	Both S1 and S2 are correct
c.	S1 is not Correct and S2 is correct
d.	Both S1 and S2 are not correct

Answer: (b).Both S1 and S2 are correct

	The Greibach normal form grammar for the language L = {an bn+1 | n ≥ 0 } is
a.	S → aSB, B →bB I λ
b.	S → aSB, B →bB I b
c.	S → aSB I b, B→b
d.	S → aSB I b

Answer: (c).S → aSB I b, B→b

	Given the following statements: S1: Every context-sensitive language L is recursive. S2: There exists a recursive language that is not context sensitive. Which statement is correct?
a.	S1 is not correct and S2 is not correct
b.	S1 is not correct and S2 is correct
c.	S1 is correct and S2 is not correct
d.	S1 is correct and S2 is correct

Answer: (d).S1 is correct and S2 is correct

	The following Context-Free Grammar (CFG) : S → aB | bA A → a | as | bAA B → b | bs | aBB will generate
a.	odd numbers of a's and odd numbers of b's
b.	even numbers of a's and even numbers of b's
c.	equal numbers of a's and b's
d.	different numbers of a's and b's

Answer: (c).equal numbers of a's and b's

	Match the following: List- I List -II a. Context free grammar i. Linear bounded automaton b. Regular grammar ii. Pushdown automaton c. Context sensitive grammar iii. Turing machine d. Unrestricted grammar iv. Deterministic finite automaton code: a b c d
a.	ii iv iii i
b.	ii iv i iii
c.	iv i ii iii
d.	i iv iii ii

Answer: (b).ii iv i iii

	If all the production rules have single non - terminal symbol on the left side, the grammar defined is :
a.	context free grammar
b.	context sensitive grammar
c.	unrestricted grammar
d.	phrase grammar

Answer: (a).context free grammar

	A context free grammar for L = { w | n0 (w) > n1 (w)} is given by :
a.	S → 0 | 0 S | 1 S S
b.	S → 0 S | 1 S | 0 S S | 1 S S | 0 | 1
c.	S → 0 | 0 S | 1 S S | S 1 S |S S 1
d.	S → 0 S | 1 S | 0 | 1

Answer: (c).S → 0 | 0 S | 1 S S | S 1 S |S S 1

	Given the following grammars : G1: S → AB|aaB A → aA | ∈ B → bB | ∈ G2: S → A | B A → a A b | ab B → a b B | ∈ Which of the following is correct?
a.	G1 is ambiguous and G2 is unambiguous grammars
b.	G1 is unambiguous and G2 is ambiguous grammars
c.	both G1 and G2 are ambiguous grammars
d.	both G1 and G2 are unambiguous grammars

Answer: (c).both G1 and G2 are ambiguous grammars

	Given the following two grammars : G1 : S → AB | aaB A → a | Aa B → b G2: S→ aSbS|bSaS|λ Which statement is correct ?
a.	G1 is unambiguous, and G2 is unambiguous
b.	G1 is unambiguous and G2 is ambiguous
c.	G1 is ambiguous and G2 is unambiguous
d.	G1 is ambiguous and G2 is ambiguous

Answer: (d).G1 is ambiguous and G2 is ambiguous

35.	Match the following: List-I List-II a. Chomsky Normal form i. S→ bSS|aS|c b. Greibach Normal form ii. S→ aSb|ab c. S-grammar iii. S→ AS|a A→ SA|b d. |LL grammar iv. S→ aBSB B→ b Codes: a b c d
a.	iv iii i ii
b.	iv iii ii i
c.	iii iv i ii
d.	iii iv ii i

Answer: (c).iii iv i ii

	Which of the following is FALSE ?
a.	The grammar S→aS|aSbS|Î, where S is the only non-terminal symbol, and Î is the null string, is ambiguous.
b.	An unambiguous grammar has same left most and right most derivation.
c.	An ambiguous grammar can never be LR(k) for any k.
d.	Recursive descent parser is a top-down parser.

Answer: (b).An unambiguous grammar has same left most and right most derivation.

	The regular grammar for the language L = {a^nb^m | n + m is even} is given by (A) S → S1 | S2 S1 → a S1 | A1 A1 → b A1 | λ S2 → aaS2 | A2 A2 → b A2 | λ (B) S → S1 | S2 S1 → a S1 | a A1 S2 → aa S2 | A2 A1 → bA1 | λ A2 → bA2 | λ (C) S → S1 | S2 S1 → aaa S1 | aA1 S2 → aaS2 | A2 A1 → bA1 | λ A2 → bA2 | λ (D) S → S1 | S2 S1 → aa S1 | A1 S2 → aaS2 | aA2 A1 → bbA1 | λ A2 → bbA2 | b
a.	A
b.	B
c.	C
d.	D

Answer: (d).D

Let L = {0^n1^n | n≥0} be a context free language.
Which of the following is correct?

a. L’ is context free and L^k is not context free for any k≥1

b. L’ is not context free and L^k is context free for any k≥1

c. Both L’ and L^k is for any k≥1 are context free

d. Both L’ and L^k is for any k≥1 are not context free

Answer: (c).Both L’ and L^k is for any k≥1 are context free

The language of all non-null strings of a’s can be defined by a context free grammar as follow :

S→a S|S a| a

The word a^3 can be generated by .... different trees.

a. Two

b. Three

c. Four

d. Five

Answer: (c).Four

The context free grammar given by

S→XYX
X→aX|bX|λ
Y→bbb

generates the language which is defined by regular expression:

a. (a+b)*bbb

b. abbb(a+b)*

c. (a+b)*(bbb)(a+b)*

d. (a+b)(bbb)(a+b)*

Answer: (c).(a+b)*(bbb)(a+b)*

Given the following two languages :

L1={a^n b a^n|n>0}
L2={a^n b a^n b^n+1|n>0}

Which of the following is correct?

a. L1 is context free language and L2 is not context free language

b. L1 is not context free language and L2 is context free language

c. Both L1 and L2 are context free languages

d. Both L1 and L2 are not context free languages

Answer: (a).L1 is context free language and L2 is not context free language

	The context free grammar for language L = {a^nb^mc^k | k = |n - m|, n≥0,m≥0,k≥0} is
a.	S→S1S3, S1→aS1c |S2|λ, S2→aS2b|λ, S3→aS3b|S4| λ, S4→bS4c|λ
b.	S→S1S3, S1→aS1S2c |λ, S2→aS2b|λ, S3→aS3b|S4| λ, S4→bS4c|λ
c.	S→S1|S2, S1→aS1S2c|λ, S2→aS2b|λ, S3→aS3b|S4| λ, S4→bS4c|λ
d.	S→S1|S3, S1→aS1c |S2|λ, S2→aS2b|λ, S3→aS3b|S4| λ, S4→bS4c|λ

Answer: (d).S→S1|S3, S1→aS1c |S2|λ, S2→aS2b|λ, S3→aS3b|S4| λ, S4→bS4c|λ

	A regular grammar for the language L = {a^nb^m | n is even and m is even}is given by
a.	S→aSb | S1; S1 → bS1a | λ
b.	S→aaS | S1; S1 → bSb | λ
c.	S→aSb | S1; S1 → S1ab | λ
d.	S→aaS | S1; S1 → bbS1 | λ

Answer: (d).S→aaS | S1; S1 → bbS1 | λ

	Given the following productions of a grammar : S→ aA| aBB; A→aaA |λ ; B→ bB| bbC; C→ B Which of the following is true ?
a.	The language corresponding to the given grammar is a set of even number of a's.
b.	The language corresponding to the given grammar is a set of odd number of a's.
c.	The language corresponding to the given grammar is a set of even number of a's followed by odd number of b's.
d.	The language corresponding to the given grammar is a set of odd number of a's followed by even number of b's.

Answer: (b).The language corresponding to the given grammar is a set of odd number of a's.

	Which one of the following is not a Greibach Normal form grammar? (i) S ->a|bA|aA|bB A->a B->b (ii) S->a|aA|AB A->a B->b (iii) S->a|A|aA A->a
a.	(i) and (ii)
b.	(i) and (iii)
c.	(ii) and (iii)
d.	(i), (ii) and (iii)

Answer: (c).(ii) and (iii)

	The equivalent grammar corresponding to the grammar G:S→aA,A→BB,B→aBb∣εG:S→aA,A→BB,B→aBb∣ε is
a.	S→aA,A→BB,B→aBb
b.	S→a∣aA,A→BB,B→aBb∣ab
c.	S→a∣aA,A→BB∣B,B→aBb
d.	S→a∣aA,A→BB∣B,B→aBb∣ab

Answer: (d).S→a∣aA,A→BB∣B,B→aBb∣ab

	The following CFG S->aB|bA, A->a|as|bAA, B->b|bs|aBB generates strings of terminals that have
a.	odd number of a's and odd number of b's
b.	even number of a's and even number of b's
c.	equal number of a's and b's
d.	not equal number of a's and b's

Answer: (c).equal number of a's and b's

	Match the following : (i) Regular Grammar (a) Pushdown automaton (ii) Context free Grammar (b) Linear bounded automaton (iii) Unrestricted Grammar (c) Deterministic finite automaton (iv) Context Sensitive Grammar (d) Turing machine (i) (ii) (iii) (iv)
a.	(c) (a) (b) (d)
b.	(c) (a) (d) (b)
c.	(c) (b) (a) (d)
d.	(c) (b) (d) (a)

Answer: (b).

(c) (a) (d) (b)

	Context-free Grammar (CFG) can be recognized by
a.	Finite state automata
b.	2-way linear bounded automata
c.	push down automata
d.	both b and c

Answer: (d).both b and c

	A context free grammar is:
a.	type 0
b.	type 1
c.	type 2
d.	type 3

Answer: (c).type 2

	Which of the following strings is in the language defined by grammar S→0A, A→1A/0A/1
a.	01100
b.	00101
c.	10011
d.	11111

Answer: (b).00101

	Which sentence can be generated by S→d/bA, A→d/ccA:
a.	bccddd
b.	aabccd
c.	ababccd
d.	abbbd

Answer: (a).bccddd

	Identify the language which is not context - free.
a.	L = {ωωR|ωϵ{0,1}*}
b.	L = {a^nb^n|n≥0}
c.	L = {ωω|ωϵ{0,1}*}
d.	L = {a^nb^mc^md^n | n, m≥0 }

Answer: (b).L = {a^nb^n|n≥0}

	The context-free languages are closed for: (i) Intersection (ii) Union (iii) Complementation (iv) Kleene Star
a.	(i) and (iv)
b.	(i) and (iii)
c.	(ii) and (iv)
d.	(ii) and (iii)

Answer: (c).(ii) and (iv)

	Grammars that can be translated to DFAs:
a.	Left linear grammar
b.	Right linear grammar
c.	Generic grammar
d.	All of these

Answer: (b).Right linear grammar

	The grammar S → (S) ∣ SS ∣ ϵ is not suitable for predictive parsing because the grammar is
a.	Right recursive
b.	Left recursive
c.	Ambiguous
d.	An operator grammar

Answer: (c).Ambiguous

	To obtain a string of n Terminals from a given Chomsky normal form grammar, the number of productions to be used is:
a.	2n−1
b.	2n
c.	n+1
d.	n^2

Answer: (a).2n−1

	Consider the following two Grammars: G1 : S → SbS | a G2 : S → aB | ab, A→GAB | a, B→ABb | b Which of the following option is correct?
a.	Only G1 is ambiguous
b.	Only G2 is ambiguous
c.	Both G1 and G2 are ambiguous
d.	Both G1 and G2 are not ambiguous

Answer: (c).Both G1 and G2 are ambiguous

	Context sensitive language can be recognized by a:
a.	Finite state machine
b.	Deterministic finite automata
c.	Non-deterministic finite automata
d.	Linear bounded automata

Answer: (d).Linear bounded automata

Which of the following statements is/ are TRUE?

(a) The grammar $S \rightarrow SS\ a$ is ambiguous. (Where S is the start symbol)
(b) The grammar $S \rightarrow 0S1 \mid 01S \mid \epsilon$ is ambiguous. (The special symbol ϵ represents the empty string) (Where S is the start symbol)
(c) The grammar (Where S is the start symbol)
$S \rightarrow T/U$
$T \rightarrow x\ S\ y \mid xy \mid \epsilon$
$U \rightarrow yT$
generates a language consisting of the string yxxyy.

a. Only (a) and (b) are TRUE.

b. Only (a) and (c) are TRUE.

c. Only (b) and (c) are TRUE.

d. All of (a), (b) and (c) are TRUE.

Answer: (d).All of (a), (b) and (c) are TRUE.

Finite state machine can recognize language generated by ....

a. Only context free grammar

b. Only context sensitive grammar

c. Only regular grammar

d. any unambiguous grammar

Answer: (c).Only regular grammar

Context free grammar is not closed under :

a. Concatenation

b. Complementation

c. Kleene Star

d. Union

Answer: (b).Complementation