

Summary in Graph

Exam Summary (GO Classes Test Series 2024 | Theory of Computation | Test 3).

Qs. Attempted:	15 5 + 10	Correct Marks:	19 5 + 14
Correct Attempts:	12 5 + 7	Penalty Marks:	0 0 + 0
Incorrect Attempts:	3 0 + 3	Resultant Marks:	19 5 + 14

Total Questions:	15 5 + 10
Total Marks:	25 5 + 20
Exam Duration:	45 Minutes
Time Taken:	45 Minutes

- EXAM RESPONSE
- EXAM STATS
- FEEDBACK

Technical

Q #1

Multiple Choice Type

Award: 1

Penalty: 0.33

Theory of Computation

Consider the following language L with the alphabet $\{0, 1\}$. The empty string is not in L . If the string is nonempty and has even length, then it is in L . If the string has odd length, then it is in L if and only if it is a palindrome.

Which of the following best describes L ?

- A. Regular
- B. DCFL but not regular
- C. CFL but not DCFL
- D. Not CFL

Your Answer: C

Correct Answer: C

Correct

Discuss

Q #2

Multiple Choice Type

Award: 1

Penalty: 0.33

Theory of Computation

Consider the following languages :

- i. $L_1 = \{ww \mid w \in \{a\}^*\}$
- ii. $L_2 = \{ww \mid w \in \{a,b\}^*\}$

Which of the above languages is Non-regular But CFL?

- A. Only L_1
- B. Only L_2
- C. Both
- D. None

Your Answer: D

Correct Answer: D

Correct

Discuss

Q #3

Multiple Choice Type

Award: 1

Penalty: 0.33

Theory of Computation

Consider the following languages :

- 1. The language of the CFG with productions $S \rightarrow AS \mid SB \mid \epsilon$, $A \rightarrow 0$, and $B \rightarrow 1$
- 2. The language of regular expression 0^*1^*

Which of the following is true ?

- A. 1 is proper subset of 2
- B. 2 is proper subset of 1
- C. $1 = 2$
- D. Neither 1 is subset of 2, nor 2 is subset of 1.

Your Answer: C

Correct Answer: C

Correct

Discuss

Q #4

Multiple Select Type

Award: 1

Penalty: 0

Theory of Computation

Which of the following languages are CFL But Not Regular?

- A. $L = \{a^{2n}b^{3n} \mid n > 0\}$
- B. $L = \{a^{2n}b^{3m} \mid m, n > 0\}$
- C. $L = \{a^{2n}b^3 \mid n > 0\}$
- D. $L = \{a^{2n}b^{n+m} \mid n, m > 0\}$

Your Answer: A;D

Correct Answer: A;D

Correct

Discuss

Q #5

Multiple Choice Type

Award: 1

Penalty: 0.33

Compiler Design

A grammar is said to be "useless" if and only if it produces no terminal strings. If S is the start symbol, which of the following grammars is (are) "useless"?

- $S \rightarrow AB \mid AS$
- I. $A \rightarrow B \mid a$
 $B \rightarrow A \mid b$

- $S \rightarrow SA \mid AS \mid SB$
- II. $A \rightarrow a$
 $B \rightarrow a \mid b$

- $S \rightarrow \epsilon \mid A$
- III. $A \rightarrow B$
- $B \rightarrow C$
- $C \rightarrow a$

- A. None
- B. Only II
- C. Only III
- D. Only II, III

Your Answer: B

Correct Answer: B

Correct

Discuss

Q #6

Multiple Select Type

Award: 2

Penalty: 0

Theory of Computation

Consider the following Grammar:

$$S \rightarrow rl \mid rSl \mid SS$$

Which of the following strings can be generated by this grammar?

- A. $rrllrl$
- B. $rlrrrrll$
- C. $rrlrl\ rllrl\ rrl$
- D. $rrrll\ lrlr\ rll$

Your Answer: A;D

Correct Answer: A;D

Correct

Discuss

Q #7

Multiple Select Type

Award: 2

Penalty: 0

Compiler Design

Which of the following statements are true?

- A. The grammar, $G : E \rightarrow E + E \mid E * E \mid x$ is ambiguous.
- B. A regular grammar can never be ambiguous.
- C. A grammar is ambiguous if there is some string w such that w 's right-most derivation differs from its left-most derivation.
- D. A grammar is ambiguous if there is some string w such that w has two different parse trees.

Your Answer: A;C;D

Correct Answer: A;D

Incorrect

Discuss

Q #8

Multiple Select Type

Award: 2

Penalty: 0

Theory of Computation

Let $L = \{a^p \mid p \text{ is prime}\}$ be a language. Which of the following are true?

- A. L is Not context free language.
- B. L^* is Not Context free language.
- C. Complement of L^* is regular.
- D. Complement of L is CFL.

Your Answer: A;C

Correct Answer: A;C

Correct

Discuss

Q #9

Multiple Choice Type

Award: 2

Penalty: 0.67

Theory of Computation

A context-free grammar has a set of terminals $\{0, 1, -\}$, a set of non-terminals $\{N, P\}$, where N is the start symbol, and productions given by the following .

$$\begin{aligned} N &\rightarrow 0 \mid P \mid - P \\ P &\rightarrow 1 \mid P 0 \mid P 1 \end{aligned}$$

What can be said about the language generated by this grammar?

- A. It is regular.
- B. It is Non-regular But DCFL.
- C. It is non-DCFL but CFL.
- D. It is Non-CFL.

Your Answer: A

Correct Answer: A

Correct

Discuss

Q #10

Multiple Select Type

Award: 2

Penalty: 0

Theory of Computation

Which of the following languages are not context free?

- A. $L_1 = \{0^n 1^{2n} \mid n \geq 0\}$
- B. $L_2 = \{w \in \{0, 1\}^* \mid w \neq w^R\}$.
- C. $L_3 = \{www \mid w \in \{0, 1\}^*\}$.
- D. $L_4 = \{x/y/z \mid x, y, z \in \{0, 1\}^* \text{ are binary numbers such that } x + y = z\}$. The alphabet for this language is $\{0, 1, /\}$. For example, $10/10/100 \in L_4$ and $11/1/001 \notin L_4$.

Your Answer: B;C;D

Correct Answer: C;D

Incorrect

Discuss

Q #11

Multiple Choice Type

Award: 2

Penalty: 0.67

Theory of Computation

Every day, a weather station records whether the day was sunny (S), cloudy (C) or rainy (R). A sequence of records over several days is a string in $\{S, C, R\}^*$. We call a sequence of records GO-like if:

- There are never more than three consecutive rainy days, and
- There are never more than five consecutive non-sunny days.

The language of GO-like sequences is

- A. Regular
- B. DCFL but Not regular
- C. CFL but not DCFL
- D. Not CFL

Your Answer: A

Correct Answer: A

Correct

Discuss

Q #12

Multiple Choice Type

Award: 2

Penalty: 0.67

Theory of Computation

Consider the following languages:

1. The language (accepted by final state) of $PDA(\{p, q\}, \{0, 1\}, \{X, Z\}, \delta, q, Z, \{p\})$ with δ defined by the rules $\delta(q, 0, Z) = \{(q, X Z)\}$, $\delta(q, 0, X) = \{(q, X X)\}$, $\delta(q, 1, X) = \{(p, \epsilon)\}$, and $\delta(p, 1, X) = \{(p, \epsilon)\}$.

2. The language of the CFG with productions $S \rightarrow 0 S 1 \mid 0 S \mid \epsilon$.

Which of the following is true ?

- A. 1 is proper subset of 2
- B. 2 is proper subset of 1
- C. $1 = 2$
- D. Neither 1 is subset of 2, nor 2 is subset of 1

Your Answer: A Correct Answer: A Correct Discuss

Q #13 Multiple Select Type Award: 2 Penalty: 0 Theory of Computation

Which of the following languages is/are Context Free(CFL)?

- A. $\{w\#w' \mid w, w' \in \{a, b\}^* \text{ and } w \neq w'\}$.
- B. $\{0^n 1^m \mid n \leq m \leq 2n\}$.
- C. $a^* b^* c^* - \{a^n b^n c^n \mid n \geq 0\}$.
- D. $\{w \in \{0, 1, 2\}^* \mid \#_0(w) = \#_1(w) = \#_2(w)\}$

Your Answer: A;B Correct Answer: A;B;C Incorrect Discuss

Q #14 Multiple Select Type Award: 2 Penalty: 0 Theory of Computation

An infinite language is REG-immune if it contains no infinite subset that is a regular language.

Which of the following are REG-immune languages?

- A. $\{a^n b^n \mid n \geq 0\}$
- B. $\{ww \mid w \in (a + b)^*\}$
- C. $\{w\#w \mid w \in (a + b)^*\}$
- D. $\{a^p \mid p \text{ is prime}\}$

Your Answer: A;C;D Correct Answer: A;C;D Correct Discuss

Q #15 Numerical Type Award: 2 Penalty: 0 Compiler Design

$$\begin{aligned} S &\rightarrow A0B \\ A &\rightarrow BB \mid 0 \\ B &\rightarrow AA \mid 1 \end{aligned}$$

What is the number of terminal strings of length 5 generated by the context-free grammar shown above?

Your Answer: 5 Correct Answer: 5 Correct Discuss

You're doing Great!