Started on	Tuesday, 18 October 2022, 9:05 PM
State	Finished
Completed on	Tuesday, 18 October 2022, 9:14 PM
Time taken	8 mins 59 secs
Marks	11.33/13.00
Grade	**8.72** out of 10.00 (**87**%)

Question **1**

Correct

Mark 1.00 out of 1.00

Linear bounded automata accepts .... languages.

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

Your answer is correct.

The correct answer is:
Context-sensitive

Question **2**

Correct

Mark 1.00 out of 1.00

The intersection of two context-free languages is always context-free.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **3**

Correct

Mark 1.00 out of 1.00

For the CYK algorithm, the grammar must be in

a. Griebach Normal Form

b. Chomsky Normal Form ✔

Your answer is correct.

The correct answer is:
Chomsky Normal Form

Question **4**

Partially correct

Mark 0.33 out of 1.00

Classify the following grammars into Chomsky Normal Form and Greibach Normal Form:

$S \rightarrow aBSB \mid aA,\ A \rightarrow a,\ B \rightarrow b$	Greibach Normal Form ✔
$S \rightarrow CA \mid BD,\ A \rightarrow a,\ ,B \rightarrow BB \mid b,\ C \rightarrow c,\ D \rightarrow DD \mid d$	None ✖
$S \rightarrow AB,\ B \rightarrow CD,\ A \rightarrow a,\ ,B \rightarrow b,\ C \rightarrow c$	Chomsky Normal Form ✖

Your answer is partially correct.

You have correctly selected 1.
The correct answer is:
$S \rightarrow aBSB \mid aA,\ A \rightarrow a,\ B \rightarrow b$
→ Greibach Normal Form,

$S \rightarrow CA \mid BD,\ A \rightarrow a,\ ,B \rightarrow BB \mid b,\ C \rightarrow c,\ D \rightarrow DD \mid d$
→ Chomsky Normal Form,

$S \rightarrow AB,\ B \rightarrow CD,\ A \rightarrow a,\ ,B \rightarrow b,\ C \rightarrow c$

→ None

Question **5**

Correct

Mark 1.00 out of 1.00

The CYK algorithm has an exponential time complexity.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **6**

Correct

Mark 1.00 out of 1.00

Given the CFG G with production rules

1. S \rightarrow a
2. S \rightarrow aA
3. S \rightarrow B
4. S \rightarrow C,
5. A \rightarrow aB
6. B \rightarrow Aa
7. A \rightarrow \lambda
8. C \rightarrow cCD
9. D \rightarrow ddd

Find production rules for equivalent CFG G' without useless symbols.

- a. 2 ✗
- b. 3 ✗
- c. 5 ✗
- d. 7 ✗
- e. 8 ✓
- f. 4 ✓
- g. 6 ✗
- h. 1 ✗
- i. 9 ✓

Your answer is correct.

The correct answers are:
4,

8,

9

Question **7**

Incorrect

Mark 0.00 out of 1.00

The language  is not a context-free language.

Select one:

- True ✖
- False

The correct answer is 'False'.

Question **8**

Correct

Mark 1.00 out of 1.00

What is the correct order to remove useless symbols from the context-free grammar?

- a. First reachable and then generating
- b. First generating and then reachable ✔

Your answer is correct.

The correct answer is:
First generating and then reachable

Question **9**

Correct

Mark 1.00 out of 1.00

Choose the correct relationship in terms of the powers of the machine (from left to right):

Non-Deterministic Finite Automata [Equal] ✔ Deterministic Finite Automata

Non-Deterministic Pushdown Automata [Superset] ✔ Deterministic Pushdown Automata

Non-Deterministic Linear Bounded Automata [Not known] ✔ Deterministic Linear Bounded Automata

Non-Deterministic Turing Machine [Equal] ✔ Deterministic Turing Machine

Your answer is correct.

The correct answer is: Choose the correct relationship in terms of the powers of the machine (from left to right):
Non-Deterministic Finite Automata [Equal] Deterministic Finite Automata
Non-Deterministic Pushdown Automata [Superset] Deterministic Pushdown Automata
Non-Deterministic Linear Bounded Automata [Not known] Deterministic Linear Bounded Automata
Non-Deterministic Turing Machine [Equal] Deterministic Turing Machine

Question **10**

Correct

Mark 1.00 out of 1.00

The language accepted by the grammar G and NPDA P are same.

$G: \hspace{0.1cm} S \rightarrow aSbb \hspace{0.1cm} | \hspace{0.1cm} abb$

$P: \hspace{0.1cm} \delta(q_0,a,X_0)=(q_1,aaX_0), \hspace{0.1cm} \delta(q_1,a,a)=(q_1,aaa), \hspace{0.1cm} \delta(q_1,b,a)=(q_1, \lambda), \hspace{0.1cm}, \delta(q_1,\lambda,X_0)=(q_f,X_0)$

where q_0, q_f are initial and final states, respectively, and X_0 is the symbol at the bottom of stack.

Select one:

- True ✔
- False

The correct answer is 'True'.

Question **11**

Correct

Mark 1.00 out of 1.00

In order to show that a language L is not a context-free language, it is enough to show that for a string $z=uvwxy \in L$, there exists and $i \geq 0$ and there exists strings u,v,w,x,y such that $uv^i w x^i y \notin L$.

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **12**

Correct

Mark 1.00 out of 1.00

There are no unit productions in the following grammar after removing λ-productions:

$S \rightarrow ABa, A \rightarrow BA,B \rightarrow a,B \rightarrow \lambda, A \rightarrow b, A \rightarrow \lambda$

Select one:

- True
- False ✔

The correct answer is 'False'.

Question **13**

Correct

Mark 1.00 out of 1.00

Every regular language is a context-sensitive language.

Select one:

- True ✔
- False

The correct answer is 'True'.

◄ Quiz 3

Jump to...

Quiz 5 ►