

Midterm 1 Results for Nicholas Khang Tran

❗ Correct answers are hidden.

Score for this attempt: **39** out of 40

Submitted Oct 1 at 2:17am

This attempt took 40 minutes.

Question 1

1 / 1 pts

A DFA is defined by 3-tuple:

☐ True

☒ false

Question 2

1 / 1 pts

An NFA is defined by 5-tuple:

☒ true

☐ false

Question 3

1 / 1 pts

A technique that is used to show a given language is not regular is known as.

☐ Dilemma

☐ DFA

☒ Pumping Lemma

☐ Regular expression

Question 4

1 / 1 pts

The machine that can exist in multiple state at any given time is known as:

☐ Turing Machine

☐ Chomsky hierarchy

☐ DFA

☒ NFA

Question 5

1 / 1 pts

$L \cup M$ = all strings that are either in L or M .

☒ true

☐ false

Question 6

1 / 1 pts

What is Pigeon Hole Principle?

☒ at least one hole must contain more than one pigeon

☐ Pigeons don't live in holes

☐ Each hole has exactly one pigeon

☐ Pigeons love holes

Question 7

1 / 1 pts

The machine that can exist in only one state at any given time is known as:

☐ Turing Machine

☐ Chomsky hierarchy

☒ DFA

☐ NFA

Question 8

1 / 1 pts

Regular Expressions are more like program syntax.

☒ true

☐ false

Question 9

1 / 1 pts

We use the symbol Σ (sigma) to denote an alphabet:

☒ True

☐ False

Question 10

1 / 1 pts

Regular Languages are NOT closed under union operation.

☐ True

☒ False

Question 11

1 / 1 pts

ϵ -closure of a state q , $ECLOSE(q)$, is the set of all states (including itself) that can be reached from q by repeatedly making an arbitrary number of ϵ -transitions.

☒ true

☐ false

Question 12

1 / 1 pts

An intermediate result that we show to prove a larger result is known as:

☐ Proof

☐ Theorem

☐ corollary

☒ lemma

Question 13

1 / 1 pts

A language L is accepted by some e-NFA if and only if L is accepted by some DFA.

☒ true

☐ false

Question 14

1 / 1 pts

Regular languages are regular under reunion.

- ☐ True
- ☒ False

Question 15

1 / 1 pts

Unix environments heavily use regular expressions.

- ☒ True
- ☐ False

Question 16

1 / 1 pts

How to decide if a string w in language L is accepted by a DFA?

- ☐ If the DFA hangs tight
- ☒ If the DFA ends in an accepting state
- ☐ If the DFA ends in a start state
- ☐ If the DFA goes to sleep

Question 17

1 / 1 pts

String 00110100 will be accepted by a DFA that accepts?

- ☐ 1100 as substring
- ☒ 1010 as substring
- ☐ Only 1s
- ☐ Only 0s

Question 18

1 / 1 pts

Empty string is represented by:

☐ Σ (sigma)

☐ δ (delta)

☒ ϵ (epsilon)

☐ α (alpha)

Question 19

1 / 1 pts

Explicit epsilon-transitions between different states introduce non-determinism:

☒ true

☐ False

Question 20

1 / 1 pts

What is the regular expression for a DFA that accepts 01 as a substring?

☒ $1^*00^*1(0+1)^*$

☐ $1^*(10)^*0^*$

☐ 1^*10^*

☐ $1^*100^*(0)^*$

Question 21

1 / 1 pts

Transitions into a dead state are implicit for a NFA.

☒ true

☐ false

Question 22

1 / 1 pts

How to minimize a DFA?

- ☐ Identify reachable states.
- ☐ Identify empty states
- ☐ Not possible
- ☒ Remove unreachable states and Identify & condense equivalent states into one

Question 23

1 / 1 pts

If $y \geq 4$, then $2^y \geq y^2$ is an example of what type of proof:

- ☒ deductive
- ☐ Definitive
- ☐ Decisive
- ☐ Dumb

Question 24

1 / 1 pts

A DFA that accepts only even number of 1s and 0s will accept which of these strings?

- ☒ 11000011
- ☐ 1010101
- ☐ 11111000
- ☐ 00000100

Question 25

1 / 1 pts

A containment hierarchy of classes of formal languages is known as:

- ☐ Turing Machine
- ☒ Chomsky hierarchy
- ☐ DFA
- ☐ NFA

Question 26

1 / 1 pts

For every DFAA there exists a regular expression R such that $L(R)=L(A)$.

☒ True

☐ False

Question 27

1 / 1 pts

Probabilistic models could be viewed as extensions of which state machines?

☐ DFA

☐ PDA

☐ TM

☒ NFA

Question 28

1 / 1 pts

If we are able to construct one of the following: DFA or NFA or ϵ -NFA or regular expression then the language is called:

☐ Not regular

☒ regular

☐ complex

☐ simple

Question 29

1 / 1 pts

A transition from one state to another state without consuming any additional input symbol is known as:

☐ λ -transitions

☐ alpha-transitions

☐ delta-transitions

☒ epsilon-transitions

Question 30

1 / 1 pts

String 00110010 will be accepted by a DFA that accepts?

- ☒ 1100 as substring
- ☐ 1010 as substring
- ☐ only 1s
- ☐ Only 0s

Question 31

1 / 1 pts

A property that confirms If a set of regular languages are combined using an operator, then the resulting language is also regular is called:

- ☐ Open property
- ☒ Closure property
- ☐ Clean property
- ☐ Clear property

Question 32

1 / 1 pts

A language is a collection of sentences of finite length all constructed from a finite alphabet of symbols:

- ☒ True
- ☐ False

Question 33

1 / 1 pts

Study of abstract computing devices or machines is known as:

- ☐ Computing
- ☐ Formal theory
- ☒ Automata theory
- ☐ Machine learning

Question 34

1 / 1 pts

True or False: $(RS + R)^* RS = (RR^*S)^*$

☐ True

☒ False

Incorrect

Question 35

0 / 1 pts

$L = \{ w \mid w \text{ is a binary string which does not contain two consecutive 0s or two consecutive 1s anywhere} \}$. What is the regular expression for this language?

☐ $(01)^* + (10)^* + 0(10)^* + 1(01)^*$

☐ $(01)^* + (10)^* + 0(10)^*$

☐ $(10)^* + 0(10)^* + 1(01)^*$

☒ $(01)^* + 10(10)^* + 1(01)^*$

Question 36

1 / 1 pts

When a language is regular?

☐ All languages are regular

☒ if we are able to construct a DFA or NFA or epsilon-NFA or regular expression

☐ If it is accepted by the program

☐ If it is accepted by TM

Question 37

1 / 1 pts

Which of these is great for modeling regular expressions?

☐ DFA

☐ PDA

☒ NFA

☐ TM

Question 38

1 / 1 pts

When a language is NOT regular?

- ☐ All languages are regular
- ☐ if we are able to construct a DFA or NFA or epsilon-NFA or regular expression
- ☒ If we can show that no FA can be built for a language
- ☐ If it is accepted by TM

Question 39

1 / 1 pts

An NFA accepts w if there exists at least one path from the start state to an accepting (or final) state that is labeled by w :

- ☒ true
- ☐ false

Question 40

1 / 1 pts

An alphabet is not a finite set of symbols:

- ☐ True
- ☒ False

Quiz Score: **39** out of 40