(0'' 1'')''

QUESTION 8

Push-Down automata is used to represent the following class of languages:

- context-free languages
- regular languages but not CFL
- recursively enumerable languages
- Languages that can be represented using turing machines

QUESTION 9

We can define automata as:

- An automaton is an abstract model of a digital computer
- An automata is a non-state based model of digital computers
- is an abstract model with no mechanism for reading inputs to solve problems
- An automata does not abstractly represent the digital computer and must represent gener

QUESTION 10

Given the following definition of PDA

Q is a finite set of internal states of the control unit

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

QUESTION 10

Given the following definition of PDA:

Q is a finite set of internal states of the control unit,

Σ is ##########,

Γ is a #########,

$\delta : Q \times (\Sigma \cup \{\lambda\}) \times \Gamma \rightarrow$ set of finite subsets of $Q \times \Gamma^*$ is the transition function, q

$z \in \Gamma$ is #########,

$F \subseteq Q$ ##########

Please state what is z

- The set of alphabet for the stack
- The starting symbol of the stack
- The set of final states in the PDA
- it indicates the iitial state of the PDA

QUESTION 11

We can classify languages into several sets based on the type of words accepted Ho

- Context-Free Languages
- Regular Languages
- non-regular languages
- languages accepted by Turing machines that is called enumerable recursive languag

QUESTION 12

- [x] languages accepted by turing machines that is called enumerable

QUESTION 12

which of the following is wrong

- ○ $(a+b)^* = (a^*+b^*)^*$
- ○ $(a+b)^* = a^*b^*$
- ○ [illegible]
- ◉ $wcw^R = (wcw^R)^R$

QUESTION 13

Using the pumping lemma, we can divide the string into the following string

- ☐ $x^n yz$, where $|xy| > m$
- ☑ $xy^n z$, where $|xy| <= m$
- ☐ xyz^n, where $y|z| <= m$
- ☐ $xy^n z$, where $|xy| = |yz|$

QUESTION 14

- [ ] $xy \angle$, where $|xy| - |y\angle|$

QUESTION 14

A grammar is said to be context-free is all its productions are of the type:

- [ ] $A \rightarrow x$, where $A \in V$ and $x ! \in (V \cup T)*$
- [ ] $A \rightarrow xy*z$, where $A \in V$ and $x,y \in (V \cup T)*$ where $z ! \in \sum$
- [x] $A \rightarrow x$, where $A \in V$ and $x \in (V \cup T)*$
- [ ] $x \rightarrow A$, where $A \in V$ and $x \in (V \cup T)+$

QUESTION 15

One of the following is not a valid case for the turning machine:

- accepted. The machine can halt and ends in a final state
- rejected the machine halts and end in a non-final state
- infinite loop the machine never halts and runs into loop
- accepted the machine runs into infinite loop but has more than one final state

QUESTION 16

Which of the following grammar that represents the Turing machine accepts the

accepted: the machine runs into infinite loop but has more than one fina

QUESTION 16

Which of the following grammar that represents the Taibah university email add
smaghthawi@taibahu.edu.sa

- $<S> ::= <fname> <lname> * @ <domain>$
  $<fname> ::= [A-Z]$
  $<lname> ::= [A-Z]$
  $<domain> ::= taibahu.edu.sa$
- $S ::= <fname> <lname> * @ <domain>$
  $fname ::= [A-Z]$
  $lname ::= [A-Z]$
  $domain ::= taibahu.edu.sa$
- $S ::= "TU" <digit> "@" <domain>,$
  $<digit> ::= [0-9],$
  $<domain> ::= "taibahu.edu.sa"$
- $<S> ::= <fname> <lname> "@" <domain>,$
  $<fname> ::= [a-z],$
  $<lname> ::= [a-z]^*,$
  $<domain> ::= "taibahu.edu.sa"$

QUESTION 17

<domain>:: = "taibahu.edu.sa"

QUESTION 17

One of the following languages is not regular and not context-free. which one is it:

- $a^n b^n$
- wcw
- $a^n b^n c^n$
- wcw^R

QUESTION 18

Ambiguous grammar can be defined as:

- [ ] Grammar that can be left-linear and right-linear
- [ ] Grammar that can be derived using left-most derivation or right-most derivation
- [x] If there exist two different derivation trees for the same word
- [ ] If there is only one derivation tree for each word in the language

QUESTION 19

A language is said to be context-free if

- [x] If there exist two different derivation trees for the same word.
- [ ] If there is only one derivation tree for each word in the language.

QUESTION 19

A language is said to be context-free if:

- [ ] There exist deterministic-finite automata that can represent the language
- [x] There exists a context-free grammar that accept the language
- [ ] There exists a regular left linear grammar that accepts the language
- [ ] There exists a turing machine with multi-tape that can represent the language

QUESTION 20

Pumping Lemma is used by mathematicians to refer to the following observation

- [x] If we put n>m objects in boxes, then at least 1 box will have one more object.
- [ ] If we put n<m objects in boxes, then at least 1 box will have one more object.
- [ ] Objects must be equal numbers as the boxes where m = n
- [ ] To observe how the pigeon behave regarding which box they choose to go to

QUESTION 21

What are the five steps needed to convert a grammar to Chomsky normal form?

QUESTION 1

1 points Save Answer

We can represent transitions in push-down automata as the following:

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

We can say the following about this transition:

- We are in state q1, when we read an 'a' we pop 1 then switch to state q1 and then push '1' to the stack.
- We are in state q1, when we read an 'a' we pop 1 then switch to state q2 and then push '11' to the stack.
- We are in state q1, when we read an 'a' we pop 1 then switch to state q1 and then push '11' to the stack.
- We are in state q1, when we read an '1' we pop 'a' then switch to state q1 and then push "aa' to the stack.

QUESTION 2

1 points Save Answer

We can define automata as:

- An automaton is an abstract model of a digital computer
- An automata is a non-state based model of digital computers
- is an abstract model with no mechanism for reading inputs to solve problems
- An automata does not abstractly represent the digital computer and must represent general problems

QUESTION 3

1 points Save Answer

Given the following nfa:

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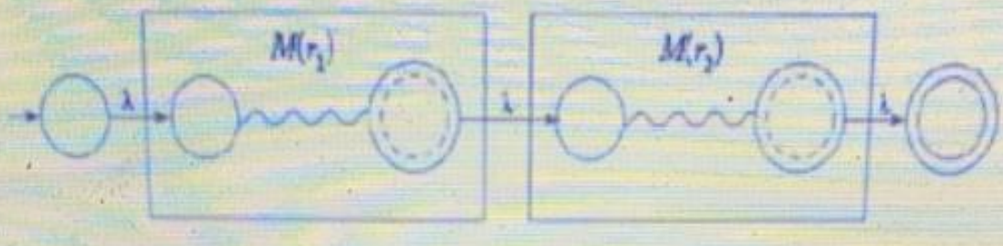
Save All Answers Save and Submit

- finite
- infinite
- irregular

QUESTION 10

Which of the following regular expressions is true for the following automata:



- L(r1/r2)
- L(r1+r2)
- L(r1.r2)
- L(r2.r1)

QUESTION 11

A language is said to be context-free if

—

$L1 - L2 = L1 . L2 \cup \phi$

QUESTION 9

Using the Pumping Lemma, we can prove that a language is :

- context-free
- finite
- infinite
- irregular

QUESTION 10

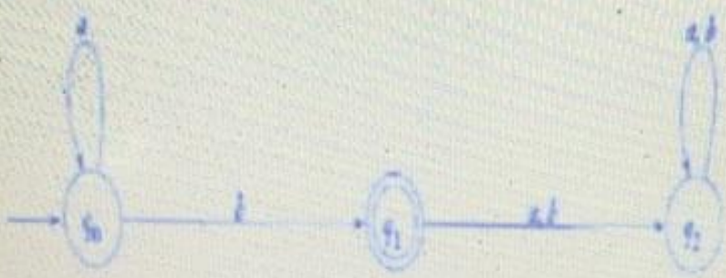
Which of the following regular expressions is true for the following autom

Click Save and Submit to save and submit. Click Save All Answers to save

- regular languages but not CFL
- recursively enumerable languages
- Languages that can be represented using turing machines

QUESTION 7

Describe the following language accepted by the automata



- All the words that must start with any number of a's followed by a single b.
- the words that can have any number of 'a' followed by 'b' followed by any number of 'a' or 'b'
- All the words that may starts with any string of 'a' followed by a 'b'
- any combination of 'a' or 'b' with at least 1 'b'

QUESTION 8

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

- any combination of 'a' or 'b' with at least 1 'b'

QUESTION 8

To prove the closure property under difference for L1 and L2, we can prove it using the following:

- $L1 - L2 = L1 \cap \overline{L2}$
- $L1 - L2 = L1 \cup \overline{L2}$
- $L1 - L2 = \phi$
- $L1 - L2 = L1 . L2 \cup \phi$

QUESTION 9

Using the Pumping Lemma, we can prove that a language is :

- context-free
- finite
- Infinite
- Irregular

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

QUESTION 12

One of the following is not a valid case for the turning machine:

- accepted: The machine can halt and ends in a final state
- rejected: the machine halts and end in a non-final state
- infinite loop: the machine never halts and runs into loop
- accepted: the machine runs into infinite loop but has more than one final stat

QUESTION 13

One of the following languages is not regular and not context-free. which one is it:

- $a^n b^n$
- wcw
- $a^n b^n c^n$
- wcw^R

- ◉ We are in state q1, when we read an 'a' we pop 1 then switch to state q1 and then push '11' to the stack.
- ○ We are in state q1, when we read an '1' we pop 'a' then switch to state q1 and then push 'aa' to the stack.

QUESTION 11

Which of the following grammar is in BNF form:

- ☐ $S -> aS \mid Sa \mid \epsilon$
- ☐ $S ::= a<S> \mid <S>a \mid a$
- ☐ $S ::= aS \mid Sa \mid \epsilon$
- ☐ $S -> a<S> \mid <S>a \mid \epsilon$

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QUESTION 12

One of the following is not a valid case for the turning machi

- ○ accepted: The machine can halt and ends in a final state
- ○ rejected: the machine halts and end in a non-final state
- ○ infinite loop: the machine never halts and runs into loop
- ◉ accepted: the machine runs into infinite loop but has more

QUESTION 13

One of the following languages is not regular and not context-free

- ○ $a^n b^n$
- ○ wcw
- ○ $a^n b^n c^n$
- ☑ wcw^R

QUESTION 3

When a language L is defined using a finite automata, we can then say about the language is:

- (●) $L = L(r)$
- ( ) $L = L(M)$
- ( ) $L = h(L)$
- ( ) $L = L(G)$

QUESTION 4

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

:A grammar is said to be context-free is all its productions are of the type

$A \rightarrow x$, where $A \in V$ and $x \notin (V \cup T)^*$ ☐

$\rightarrow xy^*z$, where $A \in V$ and $x,y \in (V \cup T)^*$ where $z \notin \Sigma$ ☐

$A \rightarrow x$, where $A \in V$ and $x \in (V \cup T)^*$ ☐

$x \rightarrow A$, where $A \in V$ and $x \in (V \cup T)^*$ ☐

السؤال 19

The language L= ww^R can be classified as

context-free language and can be represnted using CFG ☐

Regular language and can be represented using regular grammar ☐

Context-free and regular language can be represented using NFA ☐

can be represented using DFA (or NFA) ☐

السؤال 20

machines that is

QUESTION 19

Which of the following regular expressions is equivale

$((aba(aa)^*) + ba^*ba)$

- $((ba^*ba) + (aba(aa)^*))$
- $((abaaa^*) + (ba^*ba))$
- $(ba^*ba) + (a^*b^*a^*a^*a^*)$
- $ab^*(aa)^* + ba^*ba$

:Which of the following grammar is in BNF form

$S -> aS \mid Sa \mid \epsilon$ ☐

$S ::= a\langle S\rangle \mid \langle S\rangle a \mid a$ ☐

$S ::= aS \mid Sa \mid \epsilon$ ☐

$S -> a\langle S\rangle \mid \langle S\rangle a \mid \epsilon$ ☐

One of the following languages is not regular and not context-free. which one is it:

- $a^n b^n$
- wcw
- $a^n b^n c^n$
- wcw^R

السؤال 4

1 درجات

حفظ الإجابة

What does the following definition define:

(M = (Q,Σ,δ,q0 , F,

where

Q is a finite set of internal states,

Σ is a finite set of symbols called the input alphabet,

δ :Q × Σ → Q is a total function called the transition function,

q0 ∈ Q is the initial state,

F ⊆Q is a set of final states.

- A non-deterministic finite accepter
- deterministic finite accepter
- Push Down automata
- Finite automata with Epsilon transitions

السؤال 17

One of the following is not a valid case for the turning machine:

accepted: The machine can halt and ends in a final state ○

rejected: the machine halts and end in a non-final state ○

infinite loop: the machine never halts and runs into loop ○

accepted: the machine runs into infinite loop but has more than one final state ○

السؤال 18

Using the pumping lemma, we can divide the string into the following string:

QUESTION 25

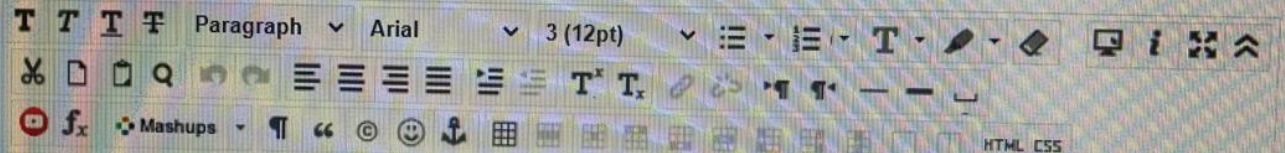
Convert the following grammar to Chomsly Normal Form (CNF) and explain every step you make:

$S \rightarrow A1 \mid B$

$A1 \rightarrow 0 \mid \varepsilon$

$B \rightarrow 1B2 \mid \varepsilon$

$C \rightarrow 3A4 \mid \varepsilon$



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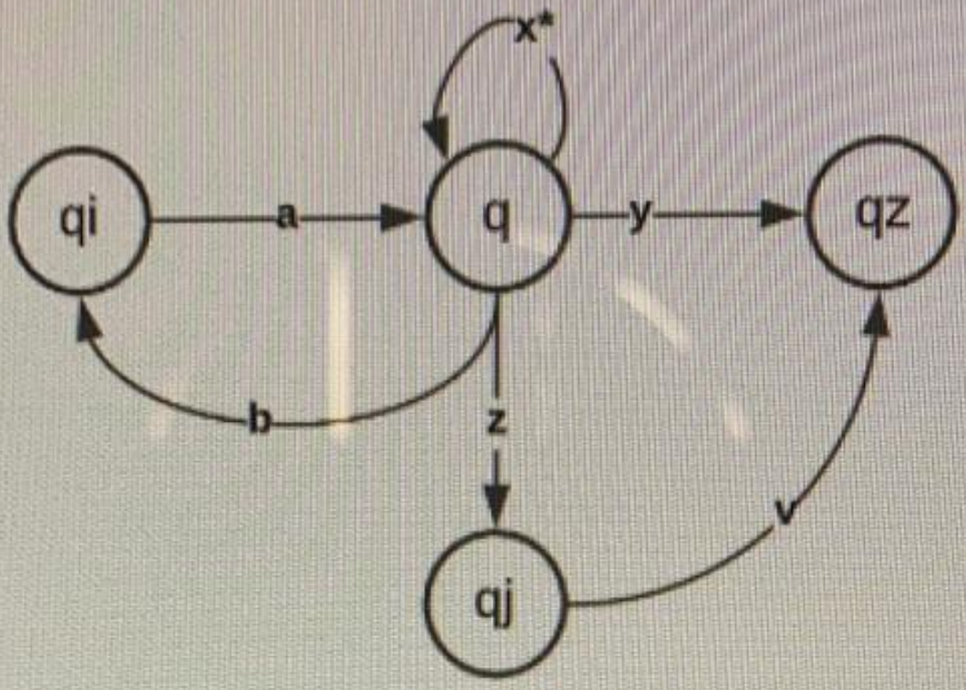
Words:0

QUESTION 26

4 po

Draw a Turing machine for the

and draw the generalized version of the machine. (Abstracted)



$q_i, ax^*y \rightarrow q_z$
$q_i, ax^*b \rightarrow q_i$
$q_j, v \rightarrow qz$

$q_i, ax^*y \rightarrow q_z$
$q_i, ax^*b \rightarrow q_i$
$q_i, ax^*z \rightarrow q_j$
$q_j, v \rightarrow qz$

$q_i ax^*y - q_z$
$q_z axbq_i$
$q_i axz - q_j$
$q_j v - q_i$

$q_i qx^*y - q_z$
$q_i qxz - q_j$
$q_j v - qz$

○ $L\ (\ (a+bb)^* + (ba^*+\lambda)$

○ $L\ (\ (a+bb^*).(ba^*+\lambda)\ )$

QUESTION 4

Given the following definition of a finite automata,

$$M = (Q, \Sigma, \delta, q_0, F),$$

What does the symbol 'F' refer to?

- ○ The set of final states
- ○ the set of transitions
- ○ the set of states
- ○ the set of alphabet in the language

QUESTION 5

Which word is not accepted by the following grammar:

$S \rightarrow aAB$

$A \rightarrow aa \mid aB \mid \lambda$

$B \rightarrow bb \mid bA \mid \lambda$

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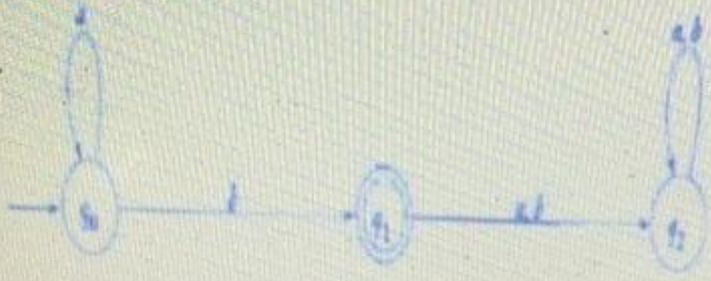
○ Languages that can be represented using turing machines

QUESTION 7

Describe the following language accepted by the automata



○ All the words that must start with any number of a's followed by a single b.

○ the words that can have any number of 'a' followed by 'b' followed by any number of 'a' or 'b'

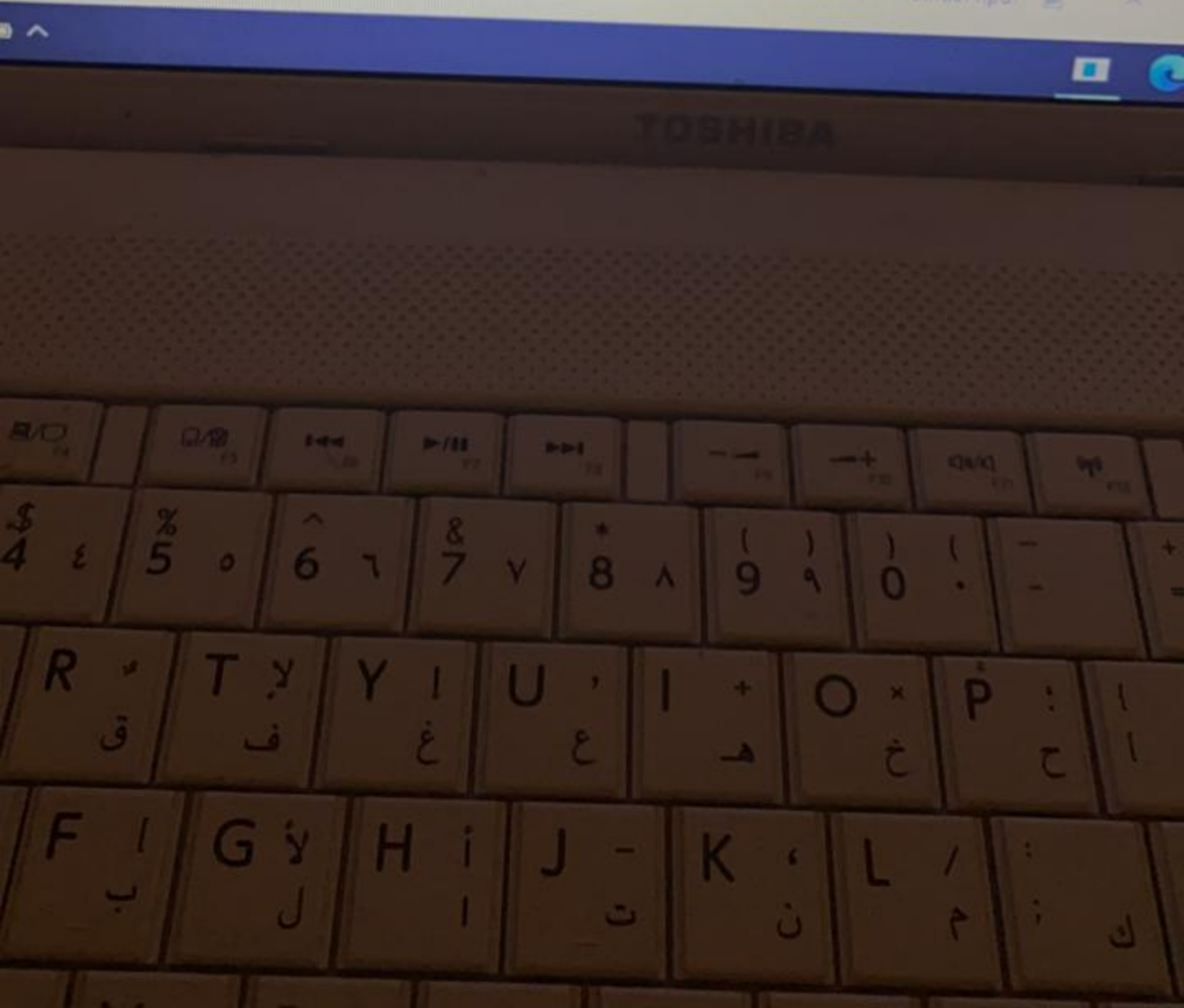
○ All the words that may starts with any string of 'a' followed by a 'b'

○ any combination of 'a' or 'b' with at least 1 'b'

QUESTION 8

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

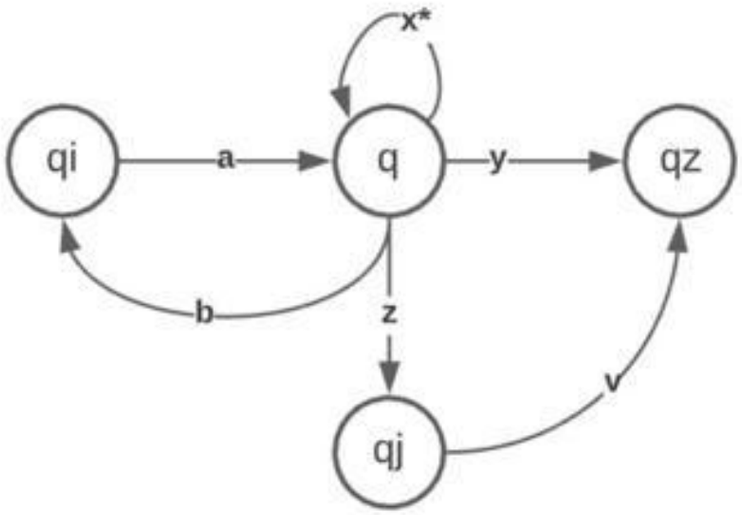
Binder1.pdf



QUESTION 19

1 points | Save Answer

Given the following FA, remove the state q and draw the generalized version of the machine. (Abstracted)



$q_i, ax^*y \rightarrow q_z$

$q_i, ax^*b \rightarrow q_i$

$q_j, v \rightarrow qz$

$q_i, ax^*y \rightarrow q_z$

$q_i, ax^*b \rightarrow q_i$

$q_i, ax^*z \rightarrow q_j$

$q_j, v \rightarrow qz$

$q_i axy \rightarrow q_z$

$q_z axbq_i$

$q_i axz \rightarrow q_j$

$q_j v \rightarrow q_i$

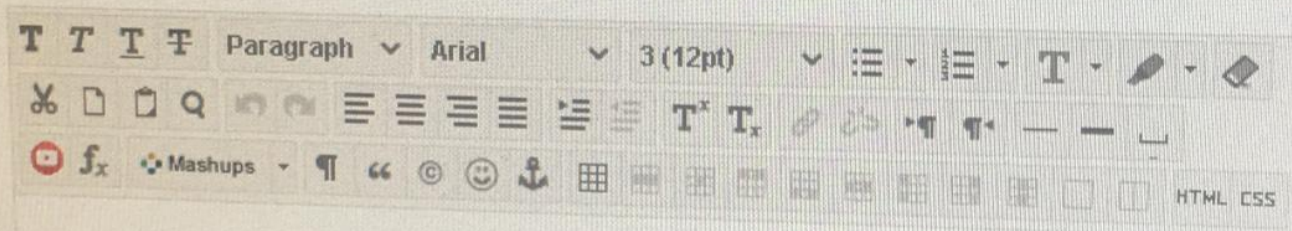
$q_i axy \rightarrow q_z$

$q_i axz \rightarrow q_j$

$q_j v \rightarrow qz$

QUESTION 23

Prove that the language $L = \{a^n b^n , n \geqslant 1\}$ is not a regular language using the pumping lemma, you need to show



Path: p

- All the words that may starts with any string of 'a' followed by a 'b'
- any combination of 'a' or 'b' with at least 1 'b'

QUESTION 8

To prove the closure property under difference for L1 and L2, we can prove it using the following:

- $L1 - L2 = L1 \cap \overline{L2}$
- $L1 - L2 = L1 \cup \overline{L2}$
- $L1 - L2 = \varphi$
- $L1 - L2 = L1 . L2 \cup \phi$

QUESTION 9

Using the Pumping Lemma, we can prove that a language is

- context-free
- finite

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

Save All Answers

QUESTION 13

Which of the following regular expressions is equivalent to:

$((aba(aa)^*) + ba^*ba)$

- $((ba^*ba) + (aba(aa)^*))$
- $((abaaa^*) + (ba^*ba))$
- $(ba^*ba) + (a^*b^*a^*a^*a^*)$
- ab*(aa)* + ba*ba

QUESTION 14

A language is said to be context-free if:

- There exist deterministic finite automata

QUESTION 25

Copy of

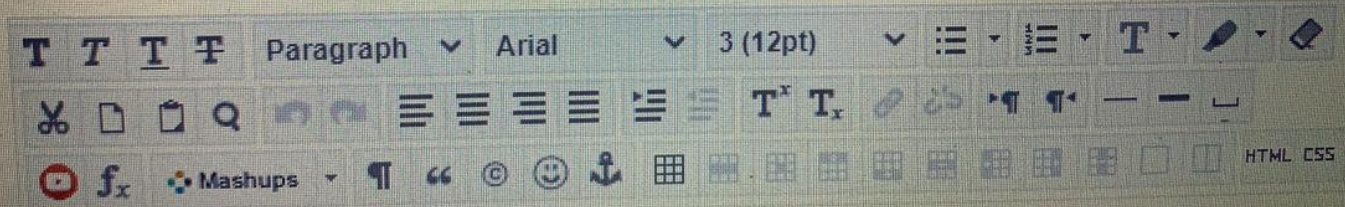
Convert the following grammar to Chomsly Normal Form (CNF) and explain every step you make:

$S \rightarrow K3 \mid B$

$C \rightarrow 3\ J\ 4 \mid \varepsilon$

$K3 \rightarrow 0C4 \mid \varepsilon$

$J \rightarrow 1J2 \mid \varepsilon$



QUESTION 13

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- infinite loop: the machine never halts and runs into loop
- accepted: the machine runs into infinite loop but has more than one final state

السؤال 12

1 درجات

:Pumping Lemma is used by mathematicians to refer to the following observation

.If we put n>m objects in boxes, then at least 1 box will have one more object

.If we put n<m objects in boxes, then at least 1 box will have one more object

.Objects must be equal numbers as the boxes where m = n

.To observe how the pigeon behave regarding which box they choose to go to

السؤال 13

1 درجات

:Ambiguous grammar can be defined as

Grammar that can be left-linear and right-linear

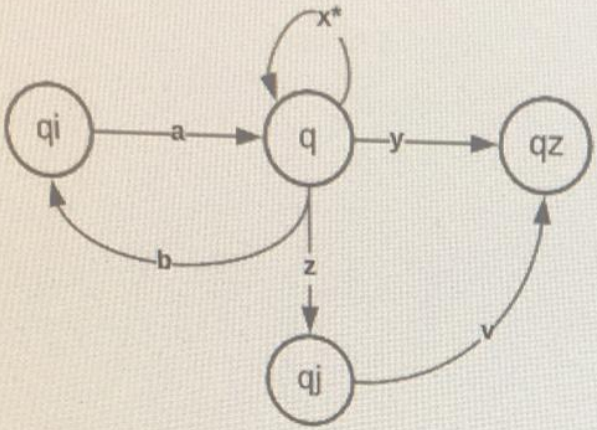
Grammar that can be derived using left-most derivation or right-most derivation

.If there exist two different derivation trees for the same word

.If there is only one derivation tree for each word in the language

السؤال 14

Given the following FA, remove the state q and draw the generalized version of the machine. *(Abstracted)*



$q_i, ax^*y \rightarrow q_z$

$q_i, ax^*b \rightarrow q_i$

$q_j, v \rightarrow qz$

$q_i, ax^*y \rightarrow q_z$

$q_i, ax^*b \rightarrow q_i$

$q_i, ax^*z \rightarrow q_j$

$q_j, v \rightarrow qz$

$q_i axy \rightarrow q_z$

$q_z axb q_i$

$q_i axz \rightarrow q_j$

$q_j v \rightarrow q_i$

$q_i qxy \rightarrow q_z$

$q_i qxz \rightarrow q_j$

$q_j v \rightarrow qz$

QUESTION 14

One of the following languages is not regular and not context-free. which one is it

$a^n b^n$

QUESTION 19

which of the following is wrong

- $(a+b)^* = (a^*+b^*)^*$
- $(a+b)^* = a^*b^*$
- [illegible]
- $wCw^R = (wCw^R)^R$

QUESTION 20

Which word is not accepted by the following grammar:

$S \rightarrow aAB$

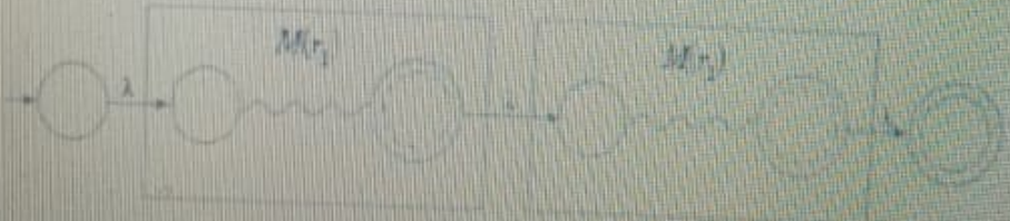
$A \rightarrow aa \mid aB \mid \lambda$

$B \rightarrow bb \mid bA \mid \lambda$

- aaabb
- abb
- a
- aaabbaa

QUESTION 2

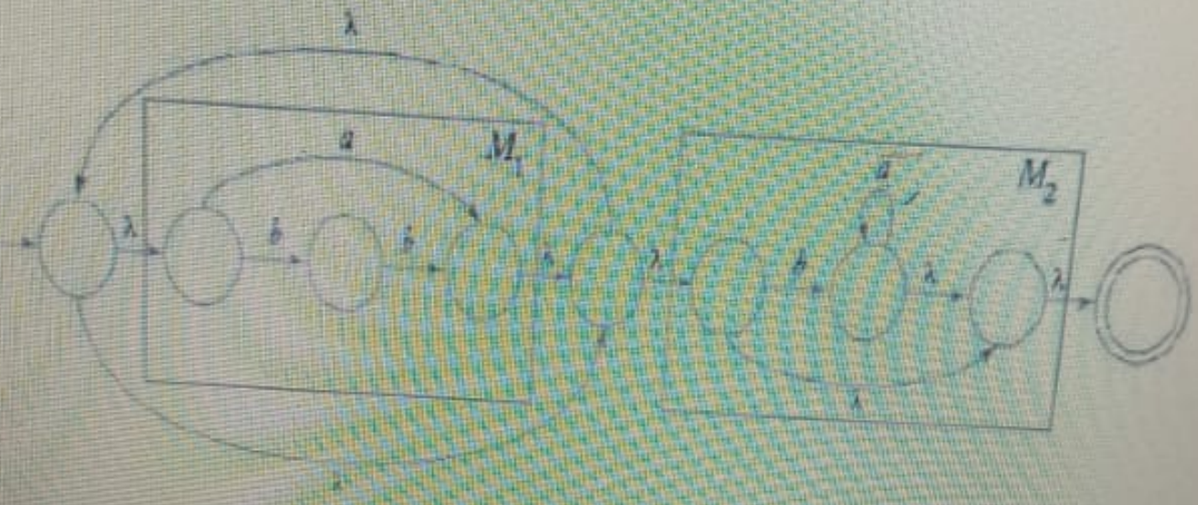
Which of the following regular expressions is true for the following automata



- L(r1/r2)
- L(r1+r2)
- L(r1.r2)
- L(r2.r1)

QUESTION 3

Given the following nfa:



Please choose the correct regular expression that represent the same language

- $L(\ (ab+bb)^*\ .\ (ba^*+\lambda)$
- $L((a+bb)^*.(ba^*+\lambda))$
- $L\ (\ (a+bb)^*+(ba^*+\lambda)\ )$
- $L((a+bb^*).(ba^*+\lambda))$

QUESTION 4

What can be said about the following grammar

QUESTION 4

What can be said about the following grammar:

$S \rightarrow A$

$A \rightarrow aB \mid \lambda$

$B \rightarrow Ab$

- The grammar is regular
- the grammar is not regular
- the grammar is right-linear
- the grammar is left-linear

QUESTION 5

We can represent transitions in push-down automata as the following:

$\delta(q_1, a, 1) = [(q_1, 11)]$

We can say the following about this transition:

- We are in state q1, when we read an 'a' we pop 1 then switch to state q1 and then push '1' to the stack
- We are in state q1, when we read an 'a' we pop 1 then switch to state q2 and then push '11' to the stack
- We are in state q1, when we read an 'a' we pop 1 then switch to state q1 and then push '11' to the stack
- We are in state q1, when we read an '1' we pop 'a' then switch to state q1 and then push 'aa' to the stack

QUESTION 6

Click Save and Submit to save and submit. Click Save All Answers to save all answers.

QUESTION 6

Given the following definition of a finite automata,

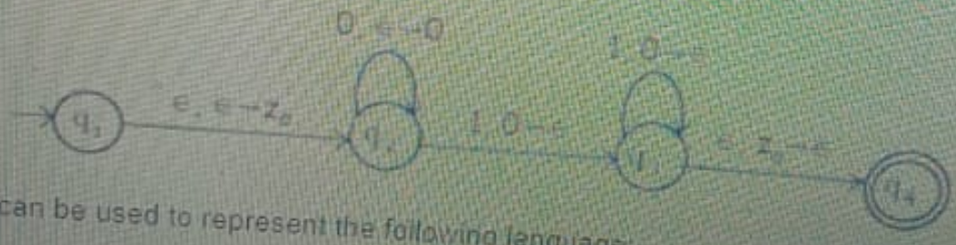
$$M = (Q, \Sigma, \delta, q_0, F),$$

What does the symbol 'F' refer to?

- (●) The set of final states
- ( ) the set of transitions
- ( ) the set of states
- ( ) the set of alphabet in the language

QUESTION 7

The following PDA



can be used to represent the following language

- ( ) ww^R
- (●) 0^n1^n where n>=0
- ( ) The language that accepts any number of 0's followed by any number of 1's 0^*1^*

Click Save and Submit to save and submit. Click Save All Answers to save all answers.