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**Theory of Automata(Cs402)**  
**Final term Papers**  
**Solved final term by Hina**

**Question: 1**

The production of the form nonterminal  $\rightarrow \Lambda$  is said to be null production.

☒ True Page 104

☐ False

**Question: 2**

Consider the following GFC :

$s \rightarrow aa \mid bB, a \rightarrow aa \mid B, B \rightarrow aS \mid \Lambda$

here  $s \rightarrow aa$  and  $A \rightarrow B$  are null productions ,while  $B \rightarrow \Lambda$  is null able production

☒ false page 105

☐ True

**Question: 3**

Which statement is true?

☒ The tape of turing machine is infinite.

☐ The tape of turing machine is finite.

☐ The tape of turing machine is infinite when the language is regular

☐ The tape of turing machine is finite when the language is nonregular.

**Question: 4**

The production of the form nonterminal  $\rightarrow$  one nonterminal is called the :

☐ Null production

☐ Null able production

☒ Unit production page 105

☐ None of the given

**Question: 5**

For a given input, it provides the compliment of Boolean AND output.

☒ NAND box (NOT AND)

☐ DELAY box

☐ OR box

☐ AND box

**Question: 6**

( Marks: 1 ) - Please choose one

Choose the correct statement.

- ☐ A Mealy machine generates no language as such ☐ A Moore machine generates no language as such ☐ A Mealy machine has no terminal state
- ☐ All of these

**Question: 7**

Let Q and R be expressed by  $ab^*a$  and  $(ba)^*$  respectively i.e  $Q=\{aa, aba, abba, \dots\}$  and  $R=\{\Lambda, ba, baba, bababa, \dots\}$ . aba is the only word in Q which can make a word in R, because the words in R don't contain the

- ☐ Single letter
- ☒ Double letter page 84
- ☐ String
- ☐ Null string

**Question: 8**

It delays the transmission of signal along the wire by one step (clock pulse).

- ☐ OR box
- ☒ DELAY box
- ☐ NAND box (NOT AND)
- ☐ AND box

**Question: 9**

To describe the complement of a language, it is very important to describe the ----- of that language over which the language is defined.

- ☐ String
- ☐ Regular Expression
- ☒ Alphabet
- ☐ Word

**Question:10**

Let L be a language defined over an alphabet  $\Sigma$ . then the language of strings, defined over  $\Sigma$ , not belonging to L denoted by  $L^c$  or  $L^c$  is called :

- ☐ Non regular language of L
- ☒ Complement of the language L
- ☐ Non of the given
- ☐ All of above

**Question:11**

For the given input, it provides the Boolean OR output

- ☐ DELAY box
- ☐ AND box
- ☐ NAND box (NOT AND)
- ☒ OR box

**Question: 12**

For the given input, AND box provides the Boolean AND output.

- ☒ True

☐ False

**Question: 13**

The current in the wire is indicated by 1 and 0 indicates the absence of the current.

☒ True

☐ False

**Question: 14**

If L is a regular language, then according to Kleene's theorem, there exists an :

☐ TG

☐ GTG

☒ FA **page 77**

☐ Non of the given

**Question: 15**

Any language that can not be expressed by a RE is said to be regular language.

☐ True

☒ False

**Question: 16**

and  $r_2 = (a + b)$  then the language  $(aa + bb)(a + b)$  will be generated by

☒  $(r_1 + r_2)$  ☐

$(r_2)(r_1)$  ☐

$(r_1)^*$

☐  $(r_1)(r_2)$

**Question: 17**

If  $L_1$  and  $L_2$  are regular languages is/are also regular language(s).

☐  $L_1 + L_2$

☐  $L_1 L_2$

☐  $L_1^*$

☒ All of above **Page 70**

**Question: 18**

Let L be a language defined over an alphabet  $\Sigma$ , then the language of strings, defined over  $\Sigma$ , not belonging to L, is called Complement of the language L, denoted by  $L^c$  or  $L'$ .

**True**

**False**

**NO19:** For a certain language L, the complement of  $L^c$  is the given language L i.e.  $(L^c)^c = L$

☒ True **Page 71**

☐ False

**Question: 20**

If L is a regular language then,  $L^c$  is also a \_\_\_\_\_ language.

- ☒ Regular
- ☐ Non-regular
- ☐ Regular but finite
- ☐ None of the given

Question: 21

If an effectively solvable problem has answered in yes or no, then this solution is called -----

- ☐ Decision problem
- ☐ Decision method
- ☒ Decision procedure
- ☐ Decision making

Question: 22

There is an approach in defining the quotient of regular languages ie the language Q is said to be quotient of two regular languages P and R, denoted by  $Q=R/P$  if :

- ☒  $PQ=R$
- ☐  $R=PQ$
- ☐  $QR=P$
- ☐ Non of above

Question: 23

consider a language L defined over an alphabet  $\Sigma$  if two strings x and y defined over  $\Sigma$  are run over an FA accepting the language L, then x and y are said to belong to the same ..... if they end in the same .....

- ☒ Class ,state
- ☐ Final ,infinite
- ☐ Regular ,nonregular
- ☐ All of Above

Question:24

If L is a regular language then, ----- is also a regular language.

- ☐  $L^m$
- ☐  $L^s$
- ☐  $L^x$
- ☒  $L^c$

Question:25

Converting each of the final states of F to non-final states and old non-final states of F to final states, FA thus obtained will reject every string belonging to L and will accept every string, defined over  $\Sigma$ , not belonging to L. is called

- ☒ Complement of L
- ☐ Finite Automata of L
- ☐ Transition Graph of L
- ☐ Regular expression of L

Question: 26

If L1 and L2 are two regular languages, then  $L1 \cup L2$  is not a regular.

- ☐ True
- ☒ False

Question:27

L= language of words containing even number of a's. Regular Expression is

- ☐  $(a+b)^*aa(a+b)^*$
- ☒  $(b+ab^*a)^*$
- ☐  $a+bb^*aab^*a$
- ☐  $(a+b)^*ab(a+b)^*$

Question:28

The regular expression defining the language  $L1 \cup L2$  can be obtained, converting and reducing the previous ----- into a ----- as after eliminating states.

- ☐ GTG, TG ☒
- ☒ FA, GTG ☐ FA,
- ☐ TG
- ☐ TG, RE

Question: 29

The language that can be expressed by any regular expression is called a Non regular language.

True

False Page 76

Question:30

Please choose one

Choose the incorrect statement:

- ☐  $(a+b)^*aa(a+b)^*$  generates Regular language.
- ☐ A language consisting of all strings over  $\Sigma=\{a,b\}$  having equal number of a's and b's is a regular language
- ☐ Every language that can be expressed by FA can also be expressed by RE
- ☒ None of these

Question: 31

The languages ----- are the examples of non regular languages

- ☐ EVEN-EVEN and PRIME
- ☒ PALINDROME and PRIME. Page 76
- ☐ PALINDROME and EVEN-EVEN
- ☐ FACTORIAL and SQUIRE

Question: 32

De-Morgan's law for sets is expressed by,

$\emptyset \quad (L_1^c \cap L_2^c)^c = L_1^c \cap L_2^c$

$\emptyset \quad (L_1^c \cap L_2^c)^c = L_1 \cap L_2$

$\emptyset \quad (L_1^c \cap L_2^c)^c = L_1 \cup L_2$

$\emptyset \quad (L_1^c \cap L_2^c)^c = L_1^c \cap L_2^c$

Question: 33

Let L be any infinite regular language, defined over an alphabet  $\Sigma$  then there exist three strings x, y and z belonging to  $\Sigma^*$  such that all the strings of the form  $xy^n z$  for  $n=1,2,3, \dots$  are the words in L. called Complement of L

$\emptyset$  Pumping Lemma

Page 77

$\emptyset$  Kleene's theorem

$\emptyset$  None of the given

$\emptyset$  1,2 both

Question: 34

Languages are proved to be regular or non regular using pumping lemma.

$\emptyset$  True

$\emptyset$  False

Question:35

----- is obviously infinite language.

$\emptyset$  EQUAL-EQUAL

$\emptyset$  EVEN-EVEN

$\emptyset$  PALINDROME

Page 80

$\emptyset$  FACTORIAL

Question: 36

If L1 and L2 are expressed by regular expressions r1 and r2, respectively then the language expressed by  $r1 + r2$  will be \_\_\_\_\_

$\emptyset$  Ir-regular

$\emptyset$  Can't be decided

$\emptyset$  Regular language

Page 77

$\emptyset$  Another Language which is not listed here

Question: 37

Let L be an infinite language accepted by a language accepted by a finite automaton with N states, then for all words W in L that have length more than N there are strings x,y and Z (y being non null string) and length  $(x)+\text{length}(y) \leq N$ .  $W=xyz$  and all strings of the form  $xy^n z$  are in L for  $n=1,2,3,\dots$

$\emptyset$  True

Page 80

☐ False

Question: 38

If, two strings  $x$  and  $y$ , defined over  $\Sigma$ , are run over an FA accepting the language  $L$ , then  $x$  and  $y$  are said to belong to the same class if they end in the same state, no matter that state is final or not.

☒ True

☐ False

Question: 39

Myhill Nerode theorem is consisting of the followings.

☐  $L$  partitions  $\Sigma^*$  into distinct classes.

☐ If  $L$  is regular then,  $L$  generates finite number of classes. ☐ If  $L$  generates finite number of classes then  $L$  is regular. ☒ All of above

Page 80

Question:40

The language  $Q$  is said to be quotient of two regular languages  $P$  and  $R$ , denoted by  $Q = P/R$  if  $PQ = R$ .

☐  $R = Q/P$

☒  $Q = R/P$  Page 83

☐  $Q = P/R$

☐  $P = R/Q$

Question:41

If two languages  $R$  and  $Q$  are given, then the prefixes of  $Q$  in  $R$  denoted by  $\text{Pref}(Q \text{ in } R)$ .

☒ True Page 83

☐ False

Question:42

Let  $Q = \{aa, abaaabb, bbaaaaa, bbbbbb bbb\}$  and  $R = \{b, bbbb, bbbaaa, bbbaaaaa\}$   $\text{Pref}(Q \text{ in } R)$  is equal to

☒  $\{b, bbba, bbbaaa\}$ , Page 83

☐  $\{b, bba, bbaaa\}$  ☐

$\{ab, bba, bbbaa\}$  ☐

$\{b, bba, bbba\}$

Question: 43

If  $R$  is regular language and  $Q$  is any language (regular/ non regular), then  $\text{Pref}(Q \text{ in } R)$  is -----.

☐ Non-regular

☐ Equal

☒ Regular Page 84

☐ Infinite

Question: 44

The regular expression thus obtained if contains at least one word then the language is not empty



otherwise the language is :

- ☐ Regular
- ☐ No regular
- ☒ Empty Page 85
- ☐ Non of the above

Question: 45

"CFG" stands for \_\_\_\_\_:

- ☐ Context Free Graph
- ☒ Context Free Grammar Page 92
- ☐ Context Finite Graph
- ☐ Context Finite Grammar

Question:46

The langue generated by CFG is called Context free language (CFL)

- ☐ False
- ☒ True

Question:47

\_\_\_\_\_states are called the halt states.

- ☒ ACCEPT and REJECT
- ☐ ACCEPT and READ
- ☐ ACCEPT AND START
- ☐ ACCEPT AND WRITE

Question:48

If a regular expression contains \* then it may define an infinite language ,with exception  $\Lambda^*$  as  $\Lambda^* = \Lambda$

e.g.

- ☐  $(\Lambda + a \Lambda^*)(\Lambda^* + \Lambda)^*$  defines finite language. While  $(\Lambda + a \Lambda^*)(\Lambda^* + \Lambda)^*$  defines an finite language.
- ☐ True
- ☒ False Page 90

Question:49

The part of an FA, where the input string is placed before it is run, is called

- ☐ State
- ☐ Transition
- ☒ Input Tape Page 110
- ☐ Output Tape

Question: 50

TM is more powerful than FSM because

- ☐ The tape movement is confined to one direction
- ☒ It has no finite state control
- ☐ It has the capability to remember arbitrary long sequences of input symbols
- ☐ None of these

NO51: In new format of an FA This state is like dead-end non final state:

- ☐ ACCEPT
- ☒ REJECT Page 110
- ☐ STATR
- ☐ READ

NO52: For language L defined over {a, b}, then L partitions {a, b}\* into ..... classes

- ☐ Infinite
- ☐ Finite
- ☒ Distinct
- ☐ Non-distinct

NO53 := language of words containing even number of a's. Regular Expression is

- ☐  $(a+b)^*aa(a+b)^*$
- ☒  $(b+ab^*a)^*$
- ☐  $a+bb^*aab^*a$
- ☐  $(a+b)^*ab(a+b)^*$

No 54: All NonNull words of the CFL can be generated by the corresponding CFG which is in CNF  
i.e the grammar in CNF will generate the same language except the :

- ☐ string
- ☐ regular language
- ☒ null string .
- ☐ non of above

NO55: The ..... is said to be ambiguous if there exist at least one word of its language that can be generated by the different production tree .

- ☐ CFL
- ☒ CFG Page 98
- ☐ GTG
- ☐ None of the given

NO56 : Between the two consecutive joints on a path

- ☐ One character can be pushed and one character can be popped
- ☒ Any no. of characters can be pushed and one character can be popped
- ☐ One character can be pushed and any no. of characters can be popped
- ☐ Any no. of characters can be pushed and any no. of characters can be popped

**NO57: In pumping lemma theorem ( $x y^n z$ ) the range of  $n$  is:**

☐  **$n=1, 2, 3, 4, \dots$**  Page 77

☐  $n=0, 1, 2, 3, 4, \dots$

☐  $n=\dots-3, -2, -1, 0, 1, 2, 3, 4, \dots$

☐  $n=\dots-3, -2, -1, 1, 2, 3, 4, \dots$

**NO58: TM is more powerful than FSM because  $\emptyset$**

The tape movement is confined to one direction ☐ **It**

**has no finite state control**

☐ It has the capability to remember arbitrary long sequences of input symbols

☐ None of these

**NO59 : If every production in CFG is one of the following forms**

**Conterminal  $\rightarrow$  semi word**

**Nonterminal  $\rightarrow$  word**

**Then the language generated by that GFC is :**

☐ **Regular**

☐ Nonregular

☐ Finite

☐ Infinite

**NO 60: Then the language generated by that CFG is:**

☐ Non regular

☐ Infinite

☐ **Regular** Page 102

☐ Finite

**NO 61: The PDA is called non-deterministic PDA when there are more than one out going edges from..... state :**

☐ START or READ

☐ POP or REJECT

☐ **READ or POP** Page 116

☐ PUSH or POP

**NO:62 Identify the TRUE statement:**

☐ A PDA is non-deterministic, if there are more than one READ states in PDA

☐ A PDA is never non-deterministic

☐ **Like TG, A PDA can also be non-deterministic** Page 116

☐ A PDA is non-deterministic, if there are more than one REJECT states in PDA

**NO:63 the language Q is infinite.**

☐ **True** Page 134

☐ False

**Left hand side of a production in CFG consists of:**

- ☐ One terminal
- ☐ More than one terminal
- ☐ One non-terminal
- ☒ Terminals and non-terminals

Page 64:

**NO65: it is very important to determine which sequences of rows do correspond to possible paths through the:**

- ☐ CFG
- ☐ CFL
- ☒ **PDA**      **Page 128**
- ☐ TAPE

**NO: 66 : The following problem(s) ----- is/are called decidable problem(s).**

- ☐ The two regular expressions define the same language
- ☐ The two FAs are equivalent
- ☒ **Both a and b**
- ☐ None of given

**NO67: Before the CFG corresponding to the given PDA is determined, the PDA is converted in to the standard form which is called the:**

- ☐ Standard form
- ☒ **Conversion form**      **Page 108**
- ☐ Left most derivation
- ☐ None of them

**NO: 68 The deviation of the word W generated by a CFG, such that at each step ,a production is applied to the left most nonterminal in the working string is said to be**

- ☐ Left most terminal
- ☒ **Left most deviation : Page 108**
- ☐ None of these
- ☐ A ,B both

**NO 69: To examine whether a certain FA accepts any words, it is required to seek the paths from ---- -- state.**

- ☐ Final to initial
- ☐ Final to final
- ☒ **Initial to final**
- ☐ Initial to initial

**NO 70: The high level language is converted into assembly language codes by a program called compiler.**

- ☒ **TRUE**
- ☐ FALSE

**NO 71: Grammatical rules which involve the meaning of words are called -----**

- Ø Syntactic Both
- Ø a and b None
- Ø of given

**NO72: Choose the correct statement.**

- A Mealy machine generates no language as such
- A Moore machine generates no language as such
- A Mealy machine has no terminal state**
- All of these

**NO: 73 Grammatical rules which do not involve the meaning of words are called -----**

- Ø Semantics

Ø **Syntactic**

Page 92

- Ø Both a and b
- Ø None of given

**NO74: - Please choose one**

**The word 'formal' in formal languages means**

- Ø They are unnecessary, in reality
- Ø Only the form of the string of symbols is significant
- Ø **The symbols used have well defined meaning**
- Ø None of these

**NO: 75 ..... is a place where the input letters can be placed until these letters are referred again. It can store as many letters as one can in a long column .**

- Ø STACK
- Ø POP AND STACK
- Ø **PUSHDOWN STACK**
- Ø None of above

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**NO 76: Consider the language L of strings, defined over  $\Sigma = \{a,b\}$ , ending in a**

- There are finite many classes generated by L, so L is regular
- **There are infinite many classes generated by L, so L is regular**
- There are finite many classes generated by L, so L is non-regular
- There are infinite many classes generated by L, so L is non-regular

**NO77: The symbols that can't be replaced by anything are called -----**

- Ø Productions
- Ø **Terminals** Page 92
- Ø Non-terminals
- Ø All of above

NO78: "One language can be expressed by more than one FA". This statement is \_\_\_\_\_

- ☒ True
- ☐ False
- ☐ Some times true & sometimes false
- ☐ None of these

NO: 79 The symbols that must be replaced by other things are called \_\_\_\_\_

- ☐ Productions
- ☐ Terminals
- ☒ Non-terminals Page 92
- ☐ None of given

NO 80: Which of the following statement is NOT true:

- ☐ FA can be considered to be an NFA
- ☐ FA can be considered to be an NFA with null string
- ☐ NFA can be considered to be an TG
- ☒ TG can be considered to be an NFA

NO 81: Let FA 3 be an FA accepting  $L1 \cap L2$  then the initial stat of FA3 must be correspond to the initial state of..... and initial state of ..... p 74

- ☐ FA3, FA2
- ☒ FA1 , FA2
- ☐ FA1,FA3
- ☐ None of the given

NO82: If  $r1 = (aa + bb)$  and  $r2 = (a + b)$  then the language  $(aa + bb)(a + b)$  will be generated by

- ☐  $(r1)(r2)$
- ☒  $(r1 + r2)$
- ☐  $(r2)(r1)$
- ☐  $(r1)^*$

NO83: The grammatical rules are often called \_\_\_\_\_

- ☒ Productions Page 92
- ☐ Terminals
- ☐ Non-terminals
- ☐ None of given

NO 84: Does the empty string match the regular expression  $|y+a|$ ?

- ☐ Yes
- ☒ No

NO 85

The terminals are designated by \_\_\_\_\_ letters, while the non-terminals are designated by \_\_\_\_\_ letters.

- ☐ Capital, bold
- ☒ Small, capital
- ☐ Capital, small
- ☐ Small, bold

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NO86: FA corresponding to an NFA can be built by introducing a state corresponding to the combination of states, for a letter having

Choices:

- ☐ no transition at certain state
- ☐ one transition at certain state
- ☒ more than one transitions at certain state
- ☐ none of the given options

NO:87  $\Sigma = \{a,b\}$  Productions  $S \rightarrow XaaX$

$X \rightarrow aXX \rightarrow bX$   $X \rightarrow \Lambda$  This grammar defines

the language expressed by \_\_\_\_\_

- ☒  $(a+b)^*aa(a+b)^*$  Page 94
- ☐  $(a+b)^*a(a+b)^*a$
- ☐  $(a+b)^*aa(a+b)^*aa$
- ☐  $(a+b)^*aba+b)^*$

NO 88: Which statement is true:

- ☒ ► The tape of turing machine is infinite.
- ☐ ► The tape of turing machine is finite.
- ☐ ► The tape of turing machine is infinite when the language is regular
- ☐ ► The tape of turing machine is finite when the language is nonregular.

NO89 : The language generated by \_\_\_\_\_ is called Context Free Language (CFL).

- ☐ FA
- ☐ TG
- ☒ CFG Page 93
- ☐ TGT

NO 90: Let  $A = \{0, 1\}$ . The number of possible strings of length 'n' that can be formed by the elements of the set A is:

- ☐ n!
- ☒  $n^2$
- ☐  $n^m$
- ☐  $2^n$

NO : 91  $S \rightarrow aXb | bXa$   $X \rightarrow aX | bX | \Lambda$  The given CFG generates the language of strings in English \_\_\_\_\_

- ☒ Beginning and ending in different letters Page 96
- ☐ Beginning and ending in same letter

- ☐ Having even-even language
- ☐ None of given

**NO92: Every regular expression can be expressed as CFG but every CFG cannot be expressed as a regular expression. This statement is:**

- ☐ Depends on the language
- ☐ None of the given options
- ☒ **True**
- ☐ False

**NO 93: The CFG is said to be ambiguous if there exists atleast one word of its language that can be generated by the different production trees,**

- ☒ **TRUE** Page 100
- ☐ FALSE

**NO 94: The language generated by that CFG is regular if \_\_\_\_\_**

- ☐ No terminal  $\rightarrow$  semi word
- ☐ No terminal  $\rightarrow$  word
- ☒ **Both a and b** Page 102
- ☐ None of given

**NO95: A regular language:**

- ☒ **Must be finite**
- ☐ Must be infinite
- ☐ Can be finite or infinite
- ☐ Must be finite and cannot be infinite

**NO96: The production of the form non terminal  $\rightarrow \Lambda$  is said to be null production .**

- ☒ **TRUE** Page 104
- ☐ FALSE

**NO 97: Who did not invent the Turing machine?**

- ☐ Alan Turing
- ☒ **A. M. Turing**
- ☐ Turing
- ☐ None of these

**NO: 98 A production is called null able production if it is of the form  $N \rightarrow \Lambda$**

- ☒ **TRUE** Page 105
- ☐ FALSE

**NO99: A DFA with n states must accept at least one string of length greater than n.**



Choices:

- ☒ True
- ☐ False

NO100: For every three regular expressions R, S, and T, the languages denoted by  $R(S \cup T)$  and  $(RS) \cup (RT)$  are the same.

Choices:

- ☒ True
- ☐ False

NO101: Choose the right option: (2)

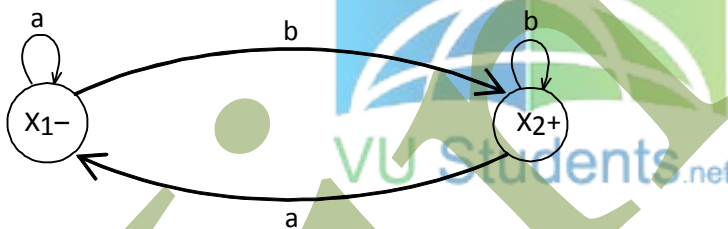
In a Mealy machine, the set of letters and the set of output characters must be same

In a Mealy machine, the set of letters and the set of output characters may not be same

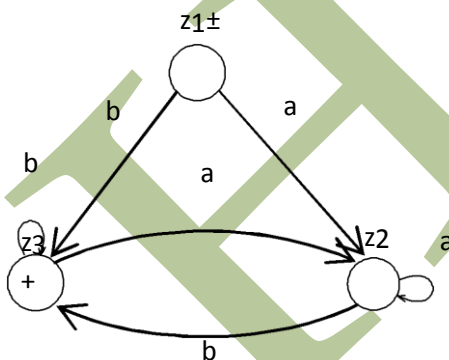
B only

A only

No102 : - Please choose one



Above given FA corresponds RE r. then FA corresponding to  $r^*$  will be



This statement is

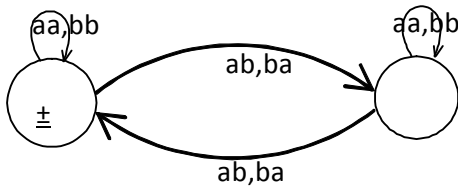
True Page 42

False

Depends on language

None of these

NO103 : - Please choose one



Above given TG has \_\_\_\_\_ RE.

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

**$(aa+bb+(ab+ba)(aa+bb)^*(ab+ba))^*$**  Page 26

$(aa+bb+(ab+ba)(aa+bb)(ab+ba))^*$

None of these

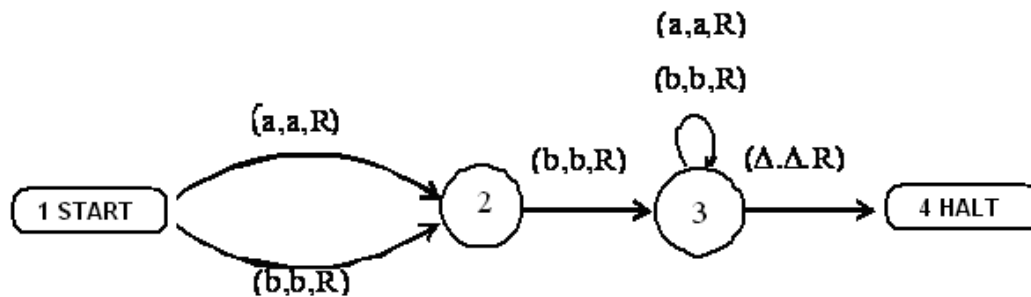
NO104: - Please choose one

Like TG, a PDA can also be non-deterministic

True

**False**

NO105 :- Please choose one :



The above machine is a/anTG \_\_\_\_\_ <http://vustudents.ning.com>

Finite Automata

**Turing machine**

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FA

TG

NO106: In FA, if one enters in a specific state but there is no way to leave it, then that specific state is called :

**Dead State** Waste

Basket Davey John

Locker All of these

NO107: - Please choose one

In CFG, the symbols that can't be replaced by anything are called \_\_\_\_\_

$\emptyset$  Terminal

- ☐ Non-Terminal
- ☒ **Production**
- ☐ All of given

**NO108: - Please choose one**

**Which of the following is NOT a regular language?**

- ☐ String of 0's whose length is a perfect square
- ☒ **Set of all palindromes made up of 0's and 1's**
- ☐ String of 0's whose length is a prime number
- ☐ All of the given options

**NO109: - Please choose one**

**Choose the incorrect (FALSE) statement**

- ☐ A Mealy machine generates no language as such
- ☐ A Mealy machine has no terminal state
- ☒ **For a given input string, length of the output string generated by a Moore machine is not more than the length of the output string generated by that of a Mealy machine . Page 62**
- ☐ All of these

**NO110: - Please choose one**

**Pumping lemma is generally used to prove that**

- ▶ A given language is infinite
- ▶ **A given language is not regular : Page 77**
- ▶ Whether two given regular expressions of a regular language are equivalent or not
- ▶ None of these

**NO111:- Please choose one**

**Which of the following is a regular language?**

- ☐ String of odd number of zeroes
- ☐ Set of all palindromes made up of 0's and 1's
- ☒ **String of 0's whose length is a prime number**
- ☐ All of these

**NO112 : lemma is generally used to prove that**

- ☐ A given language is infinite
- ☒ **A given language is not regular Page 78**
- ☐ Whether two given regular expressions of a regular language are equivalent or not
- ☐ None of these

**NO113: language can be expressed by more than one FA". This statement is \_\_\_\_\_**

- ☒ **True**
- ☐ False
- ☐ Some times true & sometimes false
- ☐ None of these

**NO114: language:**

- ☐ Must be finite
- ☒ **Must be infinite**
- ☐ Can be finite or infinite
- ☐ Must be finite and cannot be infinite

**NO115 : enters in a specific state but there is no way to leave it, then that specific state is called**

- ☐ Dead State
- ☐ Waste Basket
- ☐ Davey John Locker
- ☒ **All of these**

**NO116: symbols that can't be replaced by anything are called \_\_\_\_\_**

- ☒ **Terminal** **Page 92**
- ☐ Non-Terminal
- ☐ Production
- ☐ All of given

**NO117: following is NOT a regular language?**

- ☐ String of 0's whose length is a perfect square
- ☐ Set of all palindromes made up of 0's and 1's
- ☐ String of 0's whose length is a prime number
- ☒ **All of the given options**

**NO118: Left hand side of a production in CFG consists of**

- ☐ One terminal
- ☐ More than one terminal
- ☐ One non-terminal
- ☒ **Terminals and non-terminals** **Page 92**

**NO119: One language can be expressed by more than one FA". This statement is \_\_\_\_\_**

- ☒ **True**
- ☐ False
- ☐ Some times true & sometimes false
- ☐ None of these

**NO120: invent the Turing machine?**

- ☐ Alan Turing
- ☒ **A. M. Turing**
- ☐ Turing
- ☐ None of these

**'NO121: formal' in formal languages means**

- ☒ **The symbols used have well defined meaning**
- ☐ They are unnecessary, in reality
- ☐ Only the form of the string of symbols is significant

☐ None of these

**NO122: TM is more powerful than FSM because**

- ☐ The tape movement is confined to one direction
- ☒ **It has no finite state control**
- ☐ It has the capability to remember arbitrary long sequences of input symbols
- ☐ None of these

**NO123: A program which is the set of rules which show that which state is to be entered when a letter is read form the :**

- ☒ **TAPE** **Page 147**
- ☐ HALT
- ☐ TM
- ☐ None of above

**NO124: The process of finding the derivation of word generated by particular grammar is called :**

- ☐ PLUS TIMING
- ☒ **Parsing** **Page 142**
- ☐ HALT
- ☐ All of above

**NO125: For a non regular language there exist ..... FA:**

- ☒ **NO**
- ☐ Yes

**NO126: Bottem up parsing can be determined similar to that of TOP Down parsing with the change that in this case ,the process is started with the given string and the tree is extended till "S "is** Regular

- ☐ Non regular
- ☒ **Obtain** **Page 146**
- ☐ Finite

**NO127: A production in CFG consists of:**

- ☐ One terminal
- ☐ More than one terminal
- ☐ One non-terminal
- ☒ **Terminals and non-terminals**

**NO128: If L1 and L2 are regular languages is/are also regular language(s).**

- ☐ L1 + L2
- ☐ L1L2
- ☐ L1\*
- ☒ **All of above**

**NO129: Between the two consecutive joints on a path**

- ☐ One character can be pushed and one character can be popped

- ☐ Any no. of characters can be pushed and one character can be popped
- ☐ One character can be pushed and any no. of characters can be popped
- ☐ Any no. of characters can be pushed and any no. of characters can be popped

**NO131: Language which are context –free are called Non –CFL:**

- ☐ True
- ☒ False **Page 132**

**NO132: The following problem(s) ----- is/are called decidable problem(s).**

**The two regular expressions define the:**

- ☐ same language
- ☐ The two FAs are equivalent
- ☒ Both a and b
- ☐ None of given

**NO133: If F accept an ..... language then there are some words w.s.t  $N \leq \text{length}(w) < 2n$  :**

- ☐ Regular
- ☐ Finite
- ☒ Infinite **Page 91**
- ☐ None of given

**NO134: If an FA has N state then it must accept the word of length:**

- ☐  $N^2$
- ☐  $N-1$
- ☒  $n+1$
- ☐ all of above

**NO135: The values of input (say a & b) does not remain same in one cycle due to**

- ☐ tape
- ☐ halt
- ☒ clock pulse
- ☐ start

**NO136: Consider the following CFG**

$S \rightarrow aS \mid bS \mid aaS \mid \Lambda$

**can be observed that the word aaa can be derived from more than:**

- ☒ one production tree **Page 101**
- ☐ two production tree
- ☐ Total language tree
- ☐ All of above

**NO137: One language can have ..... CFG(s)**

- ☒ **At least one**
- ☐ At least two
- ☐ At least three
- ☐ None of them

**NO138: The reverse of the string sbfsbb over { sb, f, b}**

- ☒ **(bsbfsb)**
- ☐ bfsbs
- ☐ sbbfsb
- ☐ bbfsb

**NO139: CFG is said to be a regular grammar if it generates the regular language i.e. a CFG is said to be a regular grammar in which each production is one of the:**

- ☐ Three forms
- ☐ One form
- ☐ Four forms
- ☒ **Two forms** Page 102

**NO140: If L1 and L2 are regular languages then which statement is NOT true?**

- ☒ **(L1/L2 is always regular)**
- ☐ L1+L2 are always regular
- ☐ L1\*L2 are always regular
- ☐ None of them

**NO141: If the intersection of two regular languages is regular then the complement of the intersection of these two languages is also regular:**

- ☐ False
- ☒ **True**

**NO142: the moment a final state of ..... FA is entered ,the possibility of the initial state of ..... FA will be included as well:**

- ☐ first ,third
- ☒ **first ,second**
- ☐ second ,third
- ☐ all of above
- ☐

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**NO143: Any word generated by given CFG cannot also be expressed by Syntax tree or Generation tree or Derivation tree as well**

- ☐ true
- ☒ **false**

**NO144: According to Mayhill Nerode theorem, if L generates finite no. of classes then L is.....**

- ☒ **Regular**

- Ø Nonregular
- Ø Infinite
- Ø Finite

**NO145: L is a regular language so by kleene,s theorem ,there exists an:**

- Ø **FA**      **Page 71**

- Ø GTG
- Ø TG
- Ø CNF

**NO146: The language generated by the CFG is called the language .....by the CFG**

- Ø **Produced**
- Ø Null string
- Ø Pumping lemma
- Ø Non of then

**NO147: In CFG, the symbols that cannot be replaced by anything are called:**

- Ø None terminals
- Ø Infinite
- Ø Finite
- Ø **Terminals**

**NO148: The production  $S \rightarrow SS \mid a \mid b \mid \Lambda$  can be expressed by RE:**

- Ø  **$(a+b)^+$**
- Ø  $a-b$
- Ø  $(a-b)^+$
- Ø None of them

**NO149: Set of all palindromes over  $\{a,b\}$  is regular**

- Ø **(false)**
- Ø (true)

**NO150: An FA has same initial and final state, then it means that it has no final state.**

- Ø **(false)**
- Ø (true)

**NO151: The same non terminals can be written in single line if they have more than one.....**

- Ø **(Productions)**
- Ø Regular production
- Ø None regular production

**NO152: If  $L_1$  and  $L_2$  are two regular languages then  $L_1 \cap L_2$  is also :**

- Ø **Regular** **Page 73**



- ☐ None regular
- ☐ Finite
- ☐ None infinite

**NO154:** For language L defined over {a, b}, then L partitions  $\{a, b\}^*$  into ..... classes:

- ☒ **(Distinct)**
- ☐ Accept
- ☐ Unit production
- ☐ None of the above

**NO155:** The two FAs are

- ☐ Same
- ☒ **Equivalent** Page 85
- ☐ Different
- ☐ None of them

**NO156:** There is at least one production that has one.....on its left side:

- ☐ Terminal
- ☐ Infinite
- ☒ **None Terminal**
- ☐ All of above

**NO157:** The complement of a regular language is also a regular

- ☒ **(True)**
- ☐ False

☒ **NO159:** If an effectively solvable problem has answer in yes or no, then this solution is called : **Decision procedure** Page 85

- ☐ Decidable problem
- ☐ Solved able problem
- ☐ All of above

**NO160:** In  $\text{pref}(Q \text{ in } R)$  Q is ..... to (than) R

- ☒ **Q is not equal to R**
- ☐ Q is equal to R
- ☐ Q is infinite
- ☐ None of them

**NO61:** For FA corresponding

To  $(L_1 \cap L_2^c) \cup (L_1^c \cap L_2)$  the regular expression can be determined that defines the language accepted by this :

- ☐ TG
- ☐ GFC

☐ FA  
☐ GTG

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NO162:  $a^n b^n$  generates the ..... language:

- ☒ Non regular languages  
☐ Regular language  
☐ Infinite language  
☐ Finite language

NO: 163  $(a+b)^*a(a+b)^*b(a+b)^*$  is the RE of language defined over  $\{a,b\}$  having at least one a and one b

- ☒ True  
☐ False

Page 11

Such a language does not exist  
None of these

Question No: 164: ( Marks: 1 ) - Please choose one

NO164: If  $r_1 = (aa + bb)$  and  $r_2 = (a + b)$  then the language  $(a + b)^* (aa + bb)^*$  will be generated by :

- ☐  $(r_2)(r_1)$   
☐  $(r_1 + r_2)^*$   
☐  $(r_2)^*(r_1)^*$   
☒  $(r_1)^*$

Page 12

Question No 165: ( Marks: 1 ) - Please choose one

NO165: In FA starting state is represented by a \_\_\_\_\_ sign.

- ☒ +  
☐ -  
☐ \*  
☐ S

NO166: If w is large enough word in a CF then w can be decomposed into  $w = uvwxyz$  such that all words of the form  $uv^n x y z$  belong to :

- ☐ CNF  
☒ L  
☐ CFL  
☐ CFG

NO167: Can a turing machine's head ever be in the same location in two successive steps?

- ☐ Yes  
☐ Yes but only in finite languages  
☒ No  
☐ Yes but only in infinite languages

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NO168: Examin the following CFG and select the correct choice:  
 $S \rightarrow AB, A \rightarrow BSB, B \rightarrow CC$

C  
→

S  
S  
A  
→

a  
|  
b  
C  
→

b  
|  
b  
b

- ☒ **abb is a word in the corresponding CFL.**
- ☐ abb is not the word of corresponding CFL.
- ☐ any word can be accept from the corresponding CFL.
- ☐ Non of these

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NO169: The production of the form nonterminal  $\rightarrow$  string of two nonterminals is called a:

- ☒ **live production**

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- ☐ dead production
- ☐ type of production
- ☐ none of them

Question No: 10 ( Marks: 1 ) - Please choose one

NO170: Converting the given CFG in CNF is the first rule of \_\_\_\_\_

- ☒ **CYK algorithm**

- ☐ CKY algorithm
- ☐ KYC algorithm
- ☐ CNK algorithm

Question No: 11 ( Marks: 1 ) - Please choose one

NO171: Which statement is true?

- ☐ The PDA must have one accept state and one reject state
- ☐ The PDA must have one accept state and two reject state
- ☐ The PDA must have two accept state and two reject state
- ☒ **There is no reject state in the PDA.**

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NO172: Question No: 12 ( Marks: 1 ) - Please choose one

If a language can be expressed by a regular expression, then its complement cannot be expressed by a regular expression. This statement is:

- ☐ true
- ☒ **False**
- ☐ Depends on language
- ☐ None of the given options

**NO173:** Left hand side of CFG may consist of:

- ☐ One terminal
- ☐ More than one terminal
- ☒ **One non-terminal**
- ☐ Terminals and non-terminals

