first

Q.1 The set $A = \{X, X \in N$, and $x^2 - 3x + 2 = 0\}$ is

Finite set

Q.2 The set $A = \{X, X \in R$, and $x^2 = 9$, $2x = 4\}$ is

Empty set

3- Let $A = \{X : X$ is a letter in the word follow $\}$, $B = \{Y : Y$ is

a letter in the word wolf $\}$ $A = B$

4- if $A \cap B^C = \emptyset$ A is proper subset of B $A = B$

5- $A^C - B^C$ is equal to $A - B$ $B - A$

6- if $A = \emptyset$ then total number of element in $P(A)$ are   one

7- let A be a finite set of size n, the number of elements in

the power set of AXA is 2^{n^2}

8- If $A = \{x, y\}$, the power set of A is   None of these

9- If A & B are sets and $A \cap B = A \cup B$, then $A = B$

10- for a set A, the power set of A is denoted by 2^A, If $A = \{5, \{6\}, \{7\}\}$

which of the following option are true $\{5, \{6\}\} \in 2^{A \times A}$

$\quad$ or $\quad$ $P(A)$

Sheet 2 & sheet 3   Choose تختار
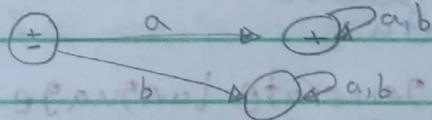
first   لول مش متلول للى   Sheet 4

1- Which of the regular expressions given below represent

the following DFA ? $(0+1)^* 1$

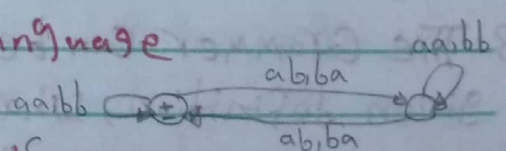2- If $E = \{aa, bb\}$, then E^* will not contain   aaa bbb

3- If $G = \{a, b\}$, then the following DFA can be represented by

Which RE   a , b

$a(a+b)^*$ b   a, b

4- one language can have ____ TG's   More than one

5- the following TG represent, which language   aaibb

EVEN - EVEN   abba

$\qquad$ aaibb   ab,ba

6- If L is a regular language then, L^C is also a language

Regular

7- Which of the following pairs of regular expressions are

equivalent ? $X(XX)^*$ and $(XX)^* X$ $(ab)^*$ and $a^* b^*$ لوقا not يتقى

X^+ and $X^+ X^*$ انت قلبلوا ويديا متشا ويمي

8- _____ is always Deterministic Finite Automation

9- look ذيولها in sheet   (a) is FA , (b) is NFA

<u>أول حل Sheet 4</u>

1- Which of the following x is accepted by given DFA
(x is a binary string $\Sigma = \{0,1\}$)? divisible by 3 and 2 or by 6

2- Given: $L_1 = \{x \in \Sigma^* \mid x$ contains even no's of 0's$\}$
$L_2 = \{x \in \Sigma^* \mid x$ contains odd no's of 1's$\}$
No of final states in language L1 U L2 ? (c)   3   متوقع 1 أول

3- The maximum number of transition which can be performed over a state in a DFA? $\Sigma = \{a, b, c\}$ (c)   3

4- The maximum sum of in degree and out degree over a state in a DFA can be determined as: $\Sigma = \{a, b, c, d\}$
depends on the language

5- The sum of minimum and maximum number of final states for a DFA n states is equal to: $n+1$

6- under which of the following operation, NFA is not closed?
<u>None</u> of the mentioned   union - Intersection - Con catenation
Kleene - Negation

7- Which of the following is an application of finite Automaton?   Compiler Design - Grammar Parsers - Text Search

<u>Sheet 5</u>

1- The entity which accepts language is termed as:
Auto Mata

2- The entity which generate language is termed as:
Grammar

3- The Grammar can be defined as: $G = (V, \Sigma, P, S)$ in the given definition, what does S represents? starting variable

4- There exists no finite automaton to accept the language? L is a set of $a^n b^n$

5- It could be proved by the pumping lemma that the language is not regular? L is a set of $a^n 1^n$

1. Which among the following can't be accepted by a regular grammar? L is a set of 0^n1^n

7. Which of the expression is appropriate? for Production P: a -> b where a∈V and b∈ ... $(V+\Sigma)^*$

8. For S -> 0S1 | e for $\Sigma = \{0,1\}^*$, which of the following is wrong for the language produced None of the Mentioned

9. The minimum number of productions required to produce a language consisting of Palindrome string over $\Sigma = \{a,b\}$ is (5)

10. Which of the following statement is correct? All Regular grammar are context free but not vice versa.

11. Are ambiguous grammar context free? True

12. Every grammar in Chomsky Normal form is: Context free

13. Which of the production rule can be accepted by Chomsky grammar? A->BC, A->a, S->e All of the Mentioned

14. Given grammar G: (1) S->AS (2) S->AAS (3) A->SA (4) A->aa Which of the following productions denies the format of chomsky normal form? 2,4

15. Which of the following grammars are in chomsky Normal Form: S->AB|BC|CD, A->0, B->1, C->2, D->3

16. With reference to the process of conversion of a context free grammer to CNF, the number of variables to be introduced for the terminals are: S->ABa A->aab B->AC (3)

17. In which of the following does the CNF conversion find its use? CYK Algorithm - Bottom up parsing preprocessing step in some algorithms - All of the Mentioned

18. let G be a grammar: S->ABle, A->a, B->b is the given grammar in CNF? True

19. let G be a grammar: S->AB|SAle, A->a, B->b is the given grammar in CNF? false

in Exams

1 - Which of the following fields is in the scale of the theory of Computation?
Computational complexity - Auto mata - formal language

2 - The set of states Q at the DFA machine is **finite set**

3 - Which of the following developments is irrelevant to advance of the theory of Computation? Grammar **Robot**

4 - Usually, the set of final states f at the NFA is
× Empty set - Singleton set - Infinite set - None of these

5 - A CFG is ambiguous if there is a string with at least two leftMost derivations of derivation الأقل شيء

6 - Among the reasons to Apply CNF is ... algorithm
efficient × proof

7 - one of the computer courses that are close to the theory of Computation is Natural language Processing switching circuit
Neural Networks - Artificial intelligence - Programming language theory
Syntactic Pattern recognition - Algorithm analysis - Compiling theory

8 - under which of the following operation, DFA is not closed?
Difference - Power set ورقة DFA - NFA sheet 4 و 6 رقم

9 - Is DFA Simulate NDFA? **True**
for

10 - which behavior of a NFA can be sti mulated by DFA?
Always

11 - A regular language over an alphabet a is one that can be obtained from **All of the mentioned**
union - Concatenation - Kleene -

12 - Regular expression $\emptyset^*$ is equivalent to
ε

13 - what is the relation between NFA - accepted language and DFA accepted language? ($\equiv$)

14- Regular expression [0,1] is equivalent to All of the mentioned

   0 U 1   —   0/1 —   0+1

15- The Concatenation ϵL is equivalent to

                   $L\epsilon$

16- Consider following regular expression

   i) $(a/b)^*$ ii) $(a^*/b^*)^*$ iii) $((\epsilon/a)b^*)^*$

17- RE is used to ... the language

              generate

18- find the wrong statement شكرا

   $DFA \rightarrow RE$ — $RE \rightarrow DFA$ — there is no $NDFA \rightarrow RE$ — Non of them

19- a? is equivalent to $a+\epsilon$ متتبعش

20- $(a+b)^*$ is equivalent to $(a^*b^*)^*$ متتبعش

21- Precedence of regular expression in decreasing order

   is $*, -, +$ متتبعش برضو

22- $\emptyset L$ is equivalent to $L\emptyset \& \emptyset$ متتبعش