

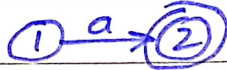
DATE: \_\_\_\_\_ Assignment 2: DAY: \_\_\_\_\_

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Reg No: 4293-FBAS/BSCS/F20

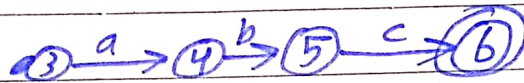
Question No. 1 & No. 2:-

a)  $(a|abc|c)^*$

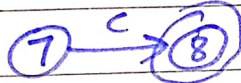
a



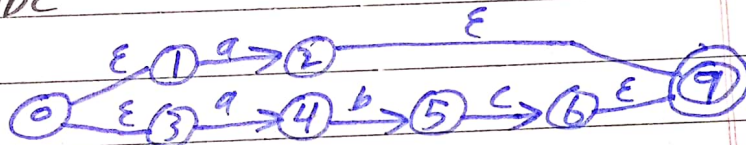
abc



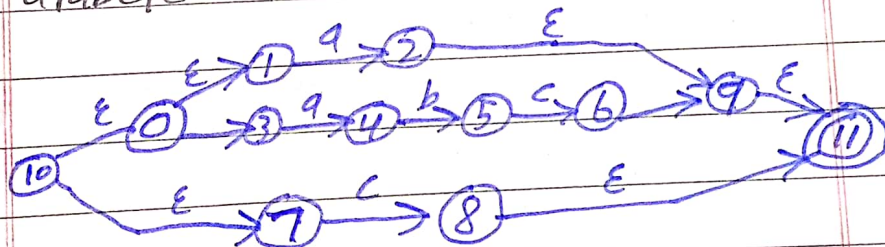
c



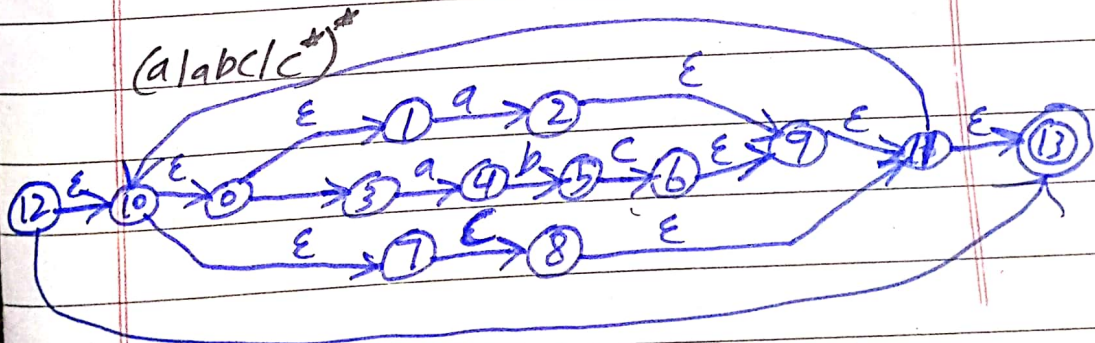
$a|abc$



$a|abc|c$



$(a|abc|c)^*$





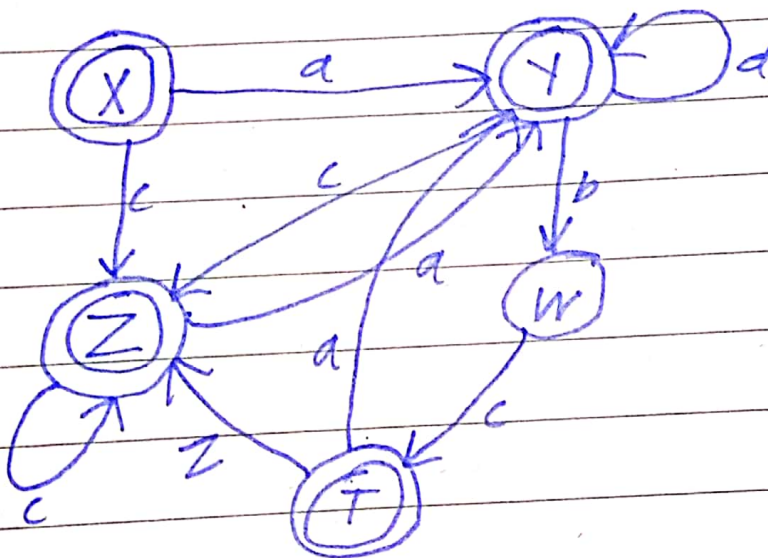
# Subset Construction Method:

DAY: \_\_\_\_\_

D.

NFA states	DFA states	Next states		
		a	b	c
$\{1, 2, 10, 0, 1, 3, 7, 13\}$	X	Y	-	Z
$\{2, 9, 11, 10, 0, 1, 3, 7, 13\}$ <sup>14</sup>	Y	Y	W	Z
$\{9, 11, 13, 10, 0, 1, 3, 8\}$	Z	Y	-	Z
$\{5\}$	W	-	-	T
$\{6, 7, 11, 13, 10, 0, 1, 3, 8\}$	T	Y	-	Z

DFA:



b)  $(aa|bb|cc)^*$ 

NFA:

aa



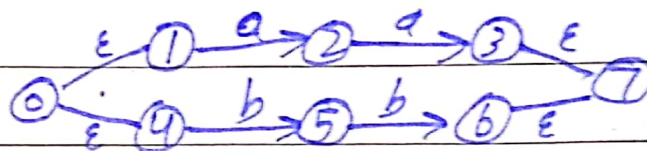
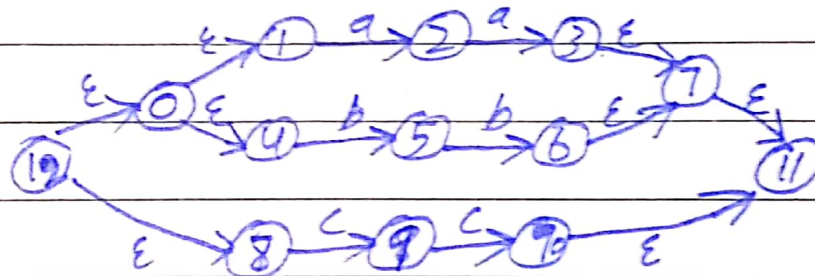
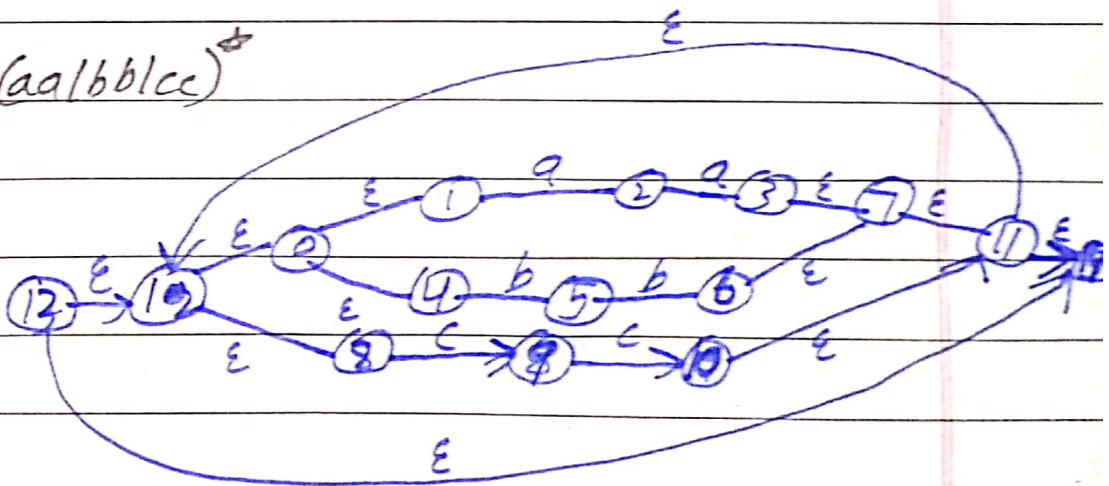
bb



cc



aa|bb

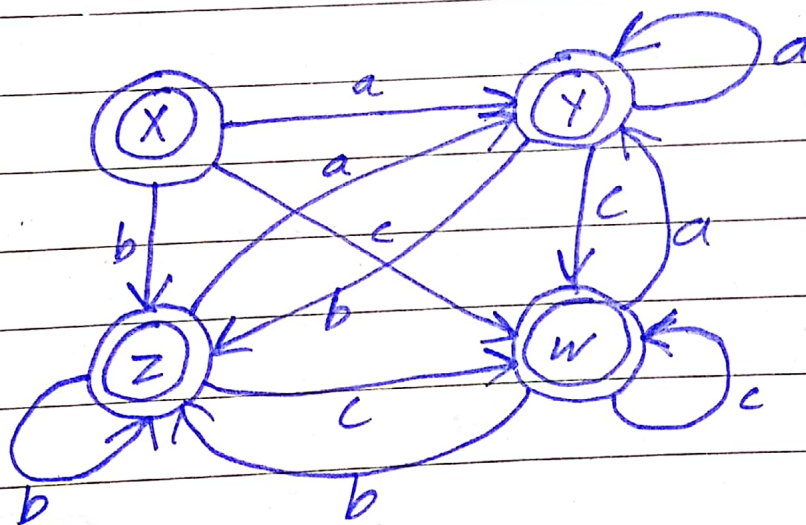
 $aa|bb|cc$  $(aa|bb|cc)^*$ 

DATE:                      Subset construction Method

DAY:                     

NFA states	DFA states	NEXT states		c
		a	b	
$\{3, 13, 9, 11, 8, 14\}$	X	Y	Z	W
$\{3, 7, 11, 14, 12, 0, 14, 8\}$	Y	Y	Z	W
$\{6, 7, 11, 14, 13, 0, 14, 8\}$	Z	Y	Z	W
$\{10, 11, 14, 12, 0, 1, 4, 8\}$	W	Y	Z	W

DFA Machine:





### Question No 3:-

The conversion from Non-deterministic Automata to Deterministic finite Automata is important in automata theory and computer science as it simplifies the computation process and makes it more efficient.

The DFA only needs to examine one input symbol at a time and determine its next state, whereas the NFA can have multiple next states for a given input symbol. This means that DFA can be implemented more easily and efficiently on a computer.

#### Examples:

One example where the conversion from NFA to DFA is required is in lexical analysis or tokenization of programming languages. Lexical analysis is the process of converting a sequence of

characters into a sequence of tokens that can be understood by a compiler or interpreter. This involves matching the input string against a set of regular expressions, which are often represented as NFAs, however for efficiency it is necessary to convert NFAs into DFAs.

Another Example where conversion from NFA to DFA is important is in network routing algorithms.

Routing algorithms needs to find the shortest path between two nodes in a network, which can be represented as a graph. To efficiently find the shortest path it is often necessary to convert NFA to DFA.