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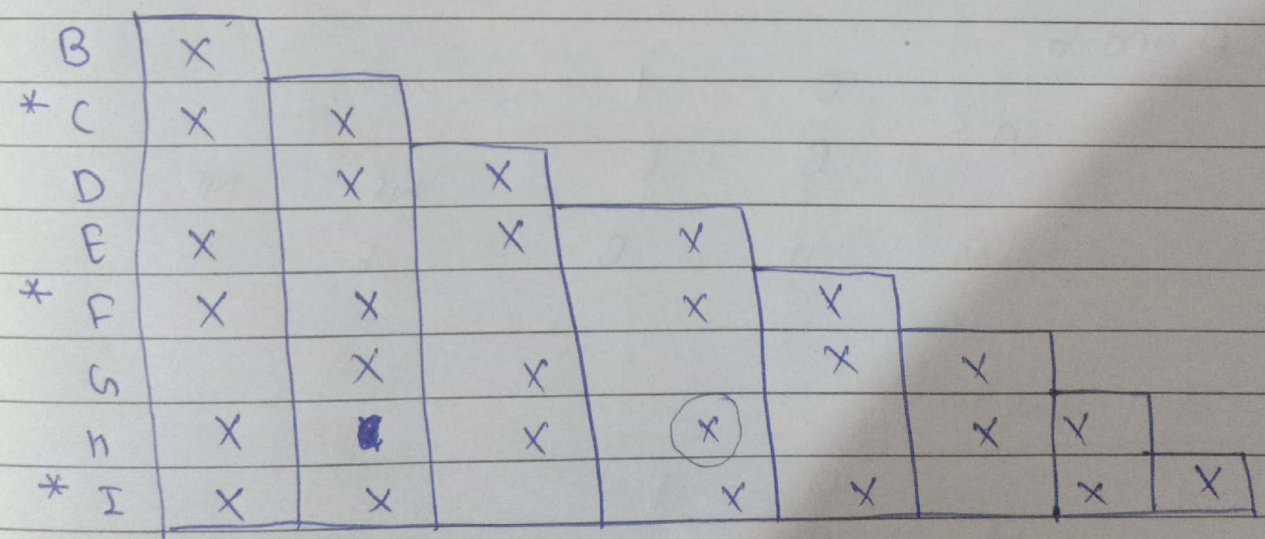
(1) Draw the following DFA using table filling algorithm where A is the start state. The states C, F and I are the final states.

δ	0	1
A	B	E
B	C	F
*C	D	H
D	E	H
E	F	I
*F	G	B
G	H	B
H	I	C
*I	A	E



Step 1 : Form combination of final and non-final states.

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Combination of A and B

	0	1	
A	B	E	(NF, NF)
B	C	F	(F, F)

A and D

	0	1	
A	B	E	(NF, NF)
D	E	H	(NF, NF)

A and E

	0	1		
A	B	E	NF	NF
E	F	I	F	F

A and G

	0	1		
A	B	E	NF	NF
G	H	B	F	F

A and H

	0	1		
A	B	E	NF	NF
H	I	C	F	F

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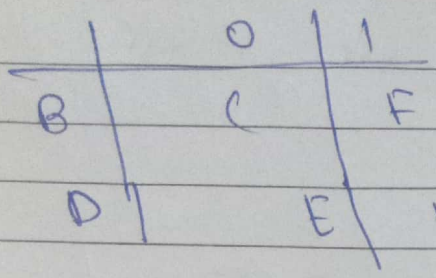
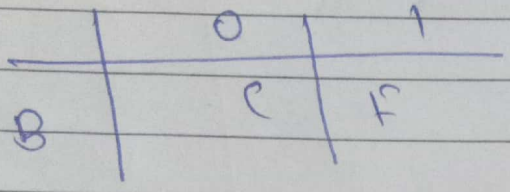
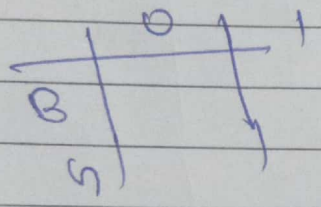
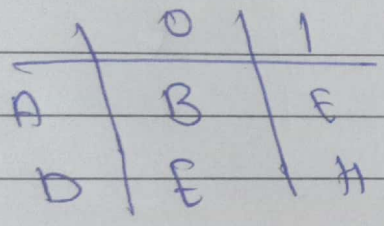


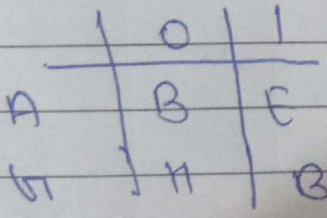
F F
NF NF



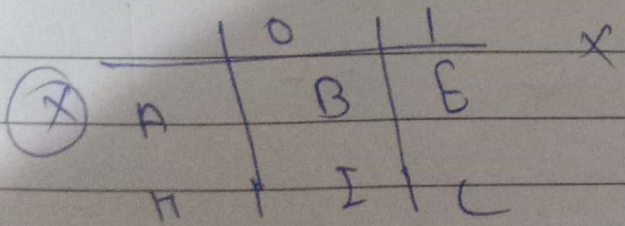




NF NF
NF NF



NF NF
NF NF



NF
F

NF
F

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(X)

	0	1
B	C	F
D	E	H

F F
NF NF

	0	1
B	C	F
E	F	I

F F
F F

	0	1
B	B	E
G	H	B

NF NF
NF NF

(X)

	0	1
B	B	E
H	I	C

NF NF
F F

	0	1
C	D	H
F	G	E

NF NF
NF NF

	0	1
C	D	H
I	A	E

NF NF
NF NF

	0	1
D	F	H
E	F	I

NF NF
F F

	0	1
D	F	I
G	H	B

F F
NF NF

	0	1
E	F	I
H	I	C

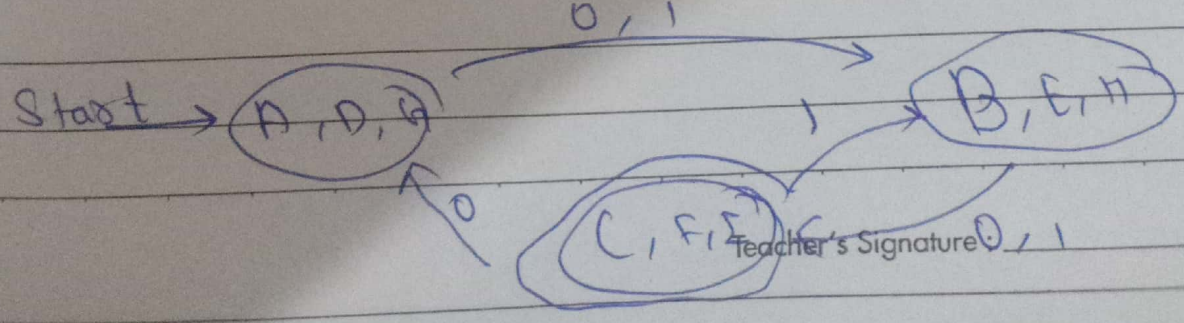
F F
F F

	0	1
G	H	B
H	I	C

NF NF
F F

Pairs

(A, D) (A, G) (D, G) ⇒ (A, D, G)
(B, H) (B, E) (E, H) ⇒ (B, H, E)
(C, F) (C, I) (F, I) ⇒ (C, F, I)
(D, H) (D, H)



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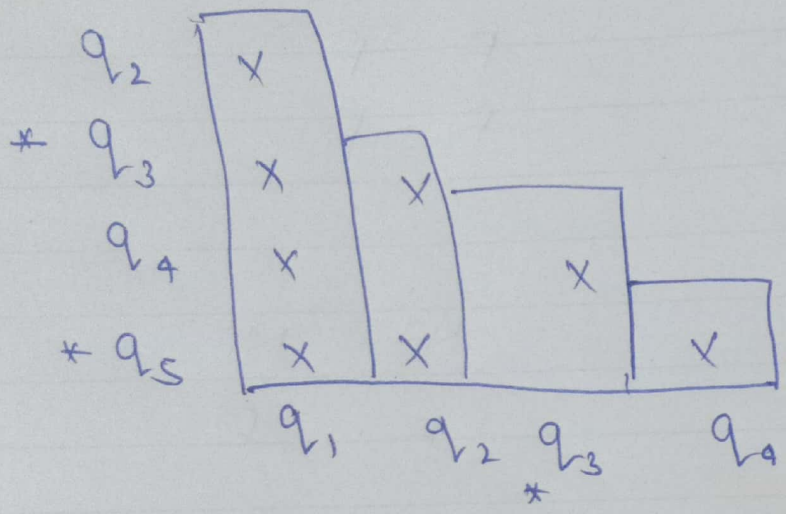
Q Consider the DFA given by the transition table

δ	0	1
$\rightarrow q_1$	q_2	q_3
q_2	q_3	q_5
$*q_3$	q_4	q_3
q_4	q_3	q_5
$*q_5$	q_2	q_5



	0	1
q_2	q_3	q_5
q_4	q_3	q_5

F F

F F

	0	1
q_1	q_2	q_3
q_2	q_3	q_5

NF F F F

	0	1
q_1	q_2	q_3
q_4	q_3	q_5

NF F F F

	0	1
q_3	q_4	q_3
q_5	q_2	q_5

NF f
NF f

(q_2, q_4) is equivalent because they reach same destination

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