Note

- Each question carries 5 Marks.
- Attempt all 6 questions
- It is compulsory to submit scanned handwritten assignment in UMS on or before 28th August 2020.

Set 1

1. Design DFA for the strings, in which third and fourth characters of the strings should be 'c' and 'b' over the $\sum=\{a,b,c\}$
2. Convert the following NFA to DFA

Present state	Next state	
	0	1
→q_0	q_0, q_1	q_1
q_1	q_1, q_2	q_2
q_2	q_2, q_3	q_3
(q_3)	q_0	q_0

3. Minimize the following DFA

Present state	Next state	
	a	b
→q_0	q_4	q_2
q_1	q_1	q_2
q_2	q_1	q_2
q_3	q_1	q_2
(q_4)	q_4	q_1

4. Convert the following Moore machine to Mealy machine

Present state	Next state		Output
	a	b	
→A	A	B	0
B	B	D	1
C	A	C	0
D	B.	D	1

5. Convert the following mealy machine to moore machine

Present state	input = a		input = b	
	Next state	Output	Next state	Output
→A	B	0	A	1
B	C	0	D	1
C	D	1	B	0
D	E	0	A	1
E	A	1	E	1

6. Design NDFA for the binary strings, which accepts only odd length of strings over the $\Sigma=\{0,1\}$

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Set 2

1. Design DFA for the strings, in which second character of the sting should be 'a' over the set $\sum$={a,b,c}
2. Convert the following NFA to DFA

Present state	Next state 0	1
→q_0	q_0, q_1	q_1, q_2
q_1	q_1, q_2	q_2
q_2	q_2, q_3	q_3, q_0
(q_3)	q_0, q_1	q_0

3. Minimize the following DFA

Present state	Next state a	b
→A	A	B
B	B	D
C	A	C
(D)	B	D

4. Convert the following moore machine to mealy machine

Present state	Next state		Output
	a	b	
→q_0	q_4	q_2	0
q_1	q_1	q_2	1
q_2	q_0	q_2	0
q_3	q_3	q_2	1
q_4	q_4	q_1	1

5. Convert the following mealy machine to moore machine

Present state	input = 0		input = 1	
	Next state	Output	Next state	Output
→A	B	1	A	0
B	C	1	D	1
C	D	1	C	1
D	E	1	A	0
E	A	0	E	1

6. Design NFA for the binary strings which accepts only even length of strings over the $\Sigma=\{0,1\}$

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Set 3

1. Design DFA for the strings, in which the third character of the strings should be 'c' and also last character of the strings should be 'b' over the $\sum=\{a,b,c\}$
2. Convert the following NFA to DFA

Present state	Next state	
	0	1
→q_0	q_0,q_1	q_1,q_2
q_1	q_1,q_2	q_2,q_3
q_2	q_2,q_3	q_3,q_0
(q_3)	q_0,q_1	q_0,q_1

3. Minimize the following DFA

Present state	Next state	
	a	b
→q_0	q_1	q_2
q_1	q_2	q_3
q_2	q_1	q_2
q_3	q_1	q_2
(q_4)	q_4	q_1

4. Convert the following moore machine to mealy machine

Present State	Next State		Output
	a	b	
→A	A	B	0
B	B	D	1
C	A	C	1
D	B.	D	1

5. Convert the following mealy machine to moore machine

Present state	input = a		input = b	
	Next state	Output	Next state	Output
→A	B	0	A	1
B	C	0	D	1
C	D	1	B	0
D	E	1	A	1
F	A	I	E	0

6.Design NFA for the binary strings , which accepts the strings in which third character of the string should be '1', over the $\Sigma=\{0,1\}$

Note

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Set 4

1. Design DFA for the Language L, in which third character of the strings should be 'c' and also first character of the string should be ' b' over the set $\sum=\{a,b,c\}$
2. Convert the following NFA to DFA

Present state	Next state	
	a	b
→A	A,B	B,C
B	B,C	C
C	D	A
Ⓓ	B	C

3. Minimize the following DFA

Present state	Next state	
	a	b
→q0	q4	q2
q1	q1	q2
q2	q0	q2
q3	q3	q2
Ⓠ4	q4	q1

4. Convert the following Moore machine to mealy machine

Present state	Next state		Output
	a	b	
→A	A	B	1
B	B	D	0
C	D	C	1
D	B.	D	1

5. Convert the following mealy machine to moore machine

Present state	input = 0		input = 1	
	Next state	Output	Next state	Output
→A	B	0	A	1
B	C	0	D	1
C	D	1	C	1
D	E	0	A	1
E	A	1	E	1

6. Design NFA for the binary strings, which accepts strings with 2nd last alphabet is 1, over the $\Sigma=\{0,1\}$

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Set 5

1. Design DFA for the strings, in which third character of the strings should be 'a' and also last two characters of the strings should be 'ab' over the $\sum=\{a,b,c\}$

2. Convert the following NFA to DFA

Present state	Next state	
	a	b
→A	A,B	B,C
B	B,C,D	C
C	D,C	A
Ⓓ	B	C

3. Minimize the following DFA

Present state	Next state	
	a	b
→q0	q1	q2
q1	q2	q3
q2	q3	q4
q3	q1	q2
Ⓠ4	q4	q1

4. Convert the following moore machine to mealy machine

| Present state | Next state | | Output |
	a	b	
→q_0	q_4	q_2	0
q_1	q_1	q_0	1
q_2	q_0	q_4	0
q_3	q_3	q_2	0
q_4	q_4	q_1	0

5. Convert the following mealy machine to moore machine

| Present state | input = 0 | | input = -1 | |
	Next state	Output	Next state	Output
→A	B	0	A	1
B	C	0	D	1
C	D	1	C	1
D	E	1	A	1
E	A	1	E	1

6. Design NFA, for the binary strings, which accepts even length of string over the $\sum=\{0,1\}$

Roll No	Set No
1	Set 1
2	Set 1
3	Set 1
4	Set 1
5	Set 1
6	Set 1
7	Set 1
8	Set 1
9	Set 1
10	Set 1
11	Set 1
12	Set 1
13	Set 1

14	Set 1
15	Set 1
16	Set 2
17	Set 2
18	Set 2
19	Set 2
20	Set 2
21	Set 2
22	Set 2
23	Set 2
24	Set 2
25	Set 2
26	Set 2
27	Set 2
28	Set 2
29	Set 2
30	Set 2
31	Set 3
32	Set 3
33	Set 3
34	Set 3
35	Set 3
36	Set 3
37	Set 3
38	Set 3
39	Set 3
40	Set 3
41	Set 3
42	Set 3
43	Set 3
44	Set 3
45	Set 3
46	Set 4
47	Set 4
48	Set 4
49	Set 4
50	Set 4
51	Set 4
52	Set 4
53	Set 4
54	Set 4

55	Set 4
56	Set 4
57	Set 4
58	Set 4
59	Set 4
60	Set 4
61	Set 5
62	Set 5
63	Set 5
64	Set 5
65	Set 5
66	Set 5
67	Set 5
68	Set 5
69	Set 5
70	Set 5
71	Set 5
72	Set 5
73	Set 5
74	Set 5
136	Set 5