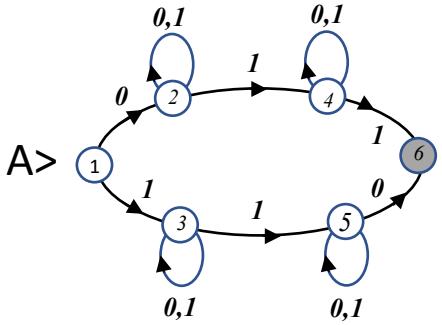
CS 302 Spring 2020
REMOTE MIDTERM ANSWERS

Answer 1 (*50* points)

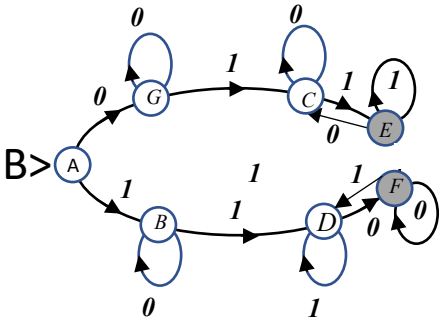
(a) *(10 pts)* ***E = 1.(1+0)*.1.(1+0)*.0 + 0.(1+0)*.1.(1+0)*.1***

(b) *(15 pts)*



(c) *(25 pts)*

state	*input*	*state'*
>1	*0*	*2*
A=1	*1*	*3*
G=2	*0*	*2*
2	*1*	*2,4*
B=3	*0*	*3*
3	*1*	*3,5*
C=2,4	*0*	*2,4*
2,4	*1*	*2,4,6*
D =3,5	*0*	*3,5,6*
3,5	*1*	*3,5*
*E=2,4,6**	*0*	*2,4*
2,4,6	*1*	*2,4,6*
*F=3,5,6**	*0*	*3,5,6*
3,5,6	*1*	*3,5*



A B C D E F G

	3	*2*	*2*	*1*	*1*	*3*
		2	*2*	*1*	*1*	*3*
			2	*1*	*1*	*2*
				1	*1*	*2*
					2	*1*
						1

*Table is full hence **B** is a minimal state DFA*

Answer 2 (*50* points)

(a) *(20 pts)*

G = ({S,A},{a,b,c], R,S) *where **R** is given as follows*

S → aSc | A ; A → aAb | e

(b) *(15 pts)* ***P = ({q},{a,b,c},{S,A,a,b,c,Z_0},δ, q,Z_0)*** *where δ has the following transitions :*

(q, e, Z_0) → (q, SZ_0) ; (q,e,S) → (q, aSc) ; (q,e,S) → (q,A) ; (q,e,A) → (q, aAb) ; (q,e,A) → (q, e)

(q, a,a) → (q,e) ; (q,b,b) → (q,e) ; (q,c,c) →(q,e) ; (q,e,Z_0) → (q, e)

(c) *(15 pts)* ***G = ({S},{0,1}, R,S)*** *where **R** is given by :*

S → 01S | 10S | e