

SOLUTIONS TO MIDTERM EXAM 2 QUESTIONS

1.a. (15 pts.)

Party A	182,679	182,679	91,340	91,340	91,340	60,893	60,893	2
Party B	42,033	42,033	42,033	42,033	42,033	42,033	42,033	-
Party C	43,648	43,648	43,648	43,648	43,648	43,648	43,648	-
Party D	264,842	132,421	132,421	88,281	88,281	88,281	66,211	4
Party E	106,862	106,862	106,862	106,862	53,431	53,431	53,431	1
<i>max</i>	264,842	182,679	132,421	106,862	91,340	88,281	66,211	

4 seats are allocated to Party D, 2 seats are allocated to Party A, and 1 seat is allocated to Party E.

1.b. (15 pts.)

Total number of votes: 640,064

Electoral coefficient: 91,437.71

Party A	1.9979	1	91,241	1	2
Party B	0.4597	-	42,033		-
Party C	0.4774	-	43,648	1	1
Party D	2.8964	2	81,967	1	3
Party E	1.1687	1	15,424		1

3 seats are allocated to Party D, 2 seats are allocated to Party A, and 1 seat each is allocated to Party C and Party E.

2. (35 pts.)

M	a	b	c
a	0	4	5
b	6	0	7
c	5	3	0

M^T	a	b	c
a	0	6	5
b	4	0	3
c	5	7	0

E	a	b	c
a	0	-2	0
b	2	0	4
c	0	-4	0

'a P b P c'	L	a	b	c	$f_k = 4$
	a	0	1	1	
	b	-1	0	1	
	c	-1	-1	0	

'a P c P b'	L	a	b	c	$f_k = -12$
	a	0	1	1	
	b	-1	0	-1	
	c	-1	1	0	

'b P a P c'	L	a	b	c	$f_k = 12$
	a	0	-1	1	
	b	1	0	1	
	c	-1	-1	0	

'b P c P a'	L	a	b	c	$f_k = 12$
	a	0	-1	-1	
	b	1	0	1	
	c	1	-1	0	

'c P a P b'	L	a	b	c	$f_k = -12$
	a	0	1	-1	
	b	-1	0	-1	
	c	1	1	0	

'c P b P a'	L	a	b	c	$f_k = -4$
	a	0	-1	-1	
	b	1	0	-1	
	c	1	1	0	

Best rankings are 'b P a P c' and 'b P c P a'

3. (35 pts.)

UNWEIGHTED MATRIX

		I		II		
		A	B	C	D	E
I	A	1	0	0.75	0.8	1
	B	0	1	0.25	0.2	0
II	C	0.75	0.5	1	0	0
	D	0.25	0	0	1	0
	E	0	0.5	0	0	1

WEIGHTED MATRIX

		I		II		
		A	B	C	D	E
I	A	0.5	0	0.375	0.4	0.5
	B	0	0.5	0.125	0.1	0
II	C	0.375	0.25	0.5	0	0
	D	0.125	0	0	0.5	0
	E	0	0.25	0	0	0.5

LIMIT MATRIX

		I		II		
		A	B	C	D	E
I	A	0.3933	0.3933	0.3933	0.3933	0.3933
	B	0.1067	0.1067	0.1067	0.1067	0.1067
II	C	0.3483	0.3483	0.3483	0.3483	0.3483
	D	0.0983	0.0983	0.0983	0.0983	0.0983
	E	0.0534	0.0534	0.0534	0.0534	0.0534