SOLUTIONS TO MIDTERM EXAM 1

1. *Given values are payoffs*

Maximax, Maximin, Hurwicz, Laplace methods (Method: 5 pts & Comment: 1 pt.) x 4

	Strict	Mod.	Lax	o_i	s_i	$\alpha = 0.7$	average
GC	120	150	200	200	120	176	156.67
BS	250	180	100	250	100	205	176.67
SC	160	160	160	160	160	160	160
			max	250	160	205	176.67

Minimax method (Method: 10 pts. & Comment: 1 pt.). Regret Matrix:

	Strict	Mod.	Lax	maks
GC	250-120 = 130	180-150 = 30	200-200 = 0	130
BS	250-250 = 0	180-180 = 0	200-100 = 100	100
SC	250-160 = 90	180-160 = 20	200-160 = 40	90
			min	90

According to Maximax, Hurwicz, and Laplace methods; recommend bio shading system.

According to Maximin and Minimax methods; recommend traditional stone cladding.

1. *Given values are costs*

Optimism, Pessimism, Hurwicz, Laplace methods (Method: 5 pts & Comment: 1 pt.) x 4

	Strict	Mod.	Lax	o_i	s_i	$\alpha = 0.7$	average
GC	120	150	200	120	200	144	156.67
BS	250	180	100	100	250	145	176.67
SC	160	160	160	160	160	160	160
			min	100	160	144	156.67

Regret method (Method: 10 pts. & Comment: 1 pt.). Regret Matrix:

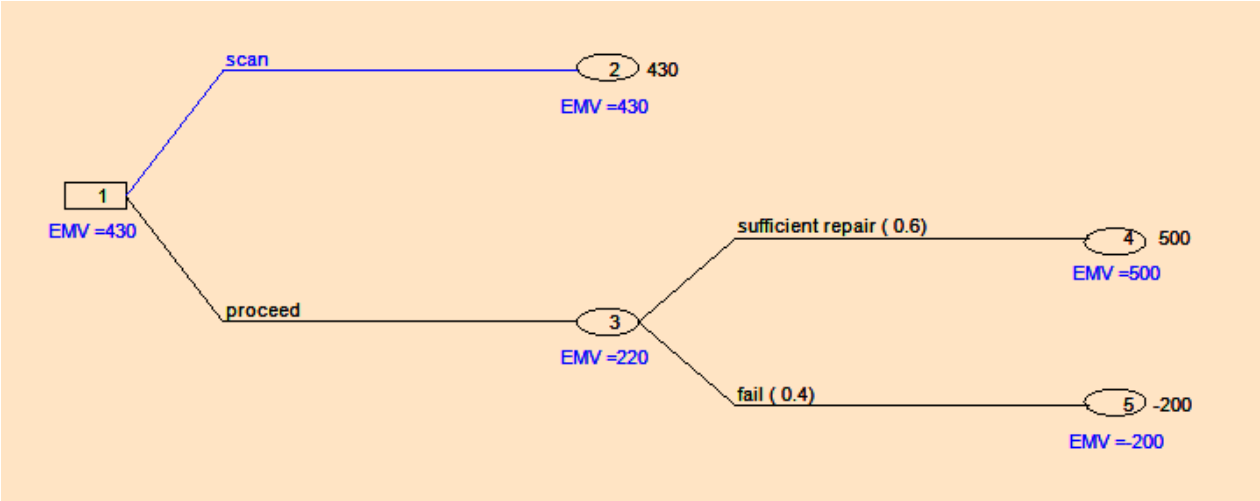
	Strict	Mod.	Lax	maks
GC	120-120 = 0	150-150 = 0	200-100 = 100	100
BS	250-120 = 130	180-150 = 30	100-100 = 0	130
SC	160-120 = 40	160-150 = 10	160-100 = 60	60
			min	60

According to Optimism method; recommend bio shading system.

According to Pessimism and Regret methods; recommend traditional stone cladding.

According to Hurwicz and Laplace methods; recommend glass curtain wall.

2. (25 pts.)



The profit for performing the scan is $480K – $50K = $430K

EMV (proceed) = $220K

Recommendation: Perform a comprehensive structural integrity scan as it yields a higher expected payoff.

3.a. (10 pts.)

Simple Majority (First-Past-The-Post)

N: 11 votes, W: 10 votes, E: 9 votes

Winner: North Wharf (N) as it has the highest vote total.

3.b. (10 pts.)

Second Ballot Method

Total votes: 30; absolute majority (> 15 votes) is required.

Since 11 < 15, the candidate with the lowest votes (E) is eliminated.

Second ballot between N and W:

The 9 planners who voted for E will now have their votes move to their second choice W.

N: 11 votes, W: 10 + 9 = 19 votes

Winner: West Gardens (W).

3.c. (20 pts.)

Borda Function

N: 11 x 2 = 22

W: 10 x 2 + 9 = 29

E: 11 + 10 + 9 x 2 = 39

Winner: East Square (E).