AI

Part C

3.1

1. ~~Dep~~ False. Depth- first search doesn't expand until it reaches a leaf node.

~~2. False h(n) = 0 seems~~

2. False. h(n) = 0 seems "optimal" however except the 8-puzzle has everything correct to the goal state, h(n) = 0 doesn't exist. Also, what kind of method is used for this h(n) is not mentioned.

3. ~~A*~~ False, it was used on Shakey the Robot. Also, it is ~~an alo~~ a heuristic algorithm. ~~and it it (kind of) [illegible]~~ It is also wrong because computers only take discrete (digital) values.

4. True. Breadth-first search is Complete period. But one should make sure there is no cyclic structure.

5. True. ~~Mal~~ Manhattan distance is an admissible heuristic because rooks only move verrically or ~~horiz~~ horizontally. Therefore, Manhattan distance should be the most optimal for ~~Ro~~ rook to move from A to B.

3.2

~~1.~~ 1)

	Node	Queue	~~to~~
	~~A~~ A	~~AA~~A(4)	
(not optimal)	B	AB	
	C	AB, AC	
	D	AB, AC, AD	
	E	ABE, AC, AD	
	F	ABE, ABF, AC, AD	
	G	ABE, ABF, ACG, AD	
	H	ABE, ABF, ACG, ACH, AD	
	I	ABE. ABF, ACG, ACH, ADI	
	J	ABE, ABF, ACG, ACH, ADI, ADJ	
	K	ABEK, ABF, ACG, ACH, ADI, ADJ	
	L	~~ABFL~~ ABEK, $\boxed{\text{ABFL}}$ done goal state reached.	

2) Uniform cost

	Node	Queue
	–	A
(optimal)	D	AD
	B	~~ADI (end)~~) AD, ~~ADB~~, AB
	C	~~AD~~, ~~AB~~, AC
	I~~ADI~~	ADI, AB, AC
	J	ADI, ADIJ~~B~~, AB, AC
	F	ADI, ADIJ, ABF, AC
flip order.	~~G~~ E	ADI, ADIJ, ABF, ABE, AC
	G	ADI, ADIJ, ABF, ABE, ACG.
	H	ADI, ADIJ, ABF, ABE, ACG, ACH
	Q	ADI, ADIJQ, ———
	N	ADI, ADIJQ, $\boxed{\text{ACGN}}$ least cost goal state

c) greedy

~~Node~~	~~Queue~~
~~A~~	~~A~~
~~D~~	~~AD~~
~~I~~	~~ADI~~
~~B~~	~~ADI, ADJ AB~~

Node	Queue
A	A
B	AB (heuristic)
F	ABF
L	$\boxed{ABFL}$ (not optimal)

d) A*

(optimal)

Node	Queue
A	A(4)
BCD	AB(6+2=8), AC(6+3=9), AD (8)
~~EFGHIJK~~ EF	ABE(12), ABF(11), AC (9) AD(8)
~~GH~~ IJ	ABE(12), ABF(11), AC(9), ADI(16), ADJ(11)
G H	ABE(12), ABF (11), ACG(11), ~~ADI~~ ACH(15), → ... alphabetical
L M	ABE(12), ABFL(14), ABFM(17), ACG(11) ...
N O	ABE(12), ABFL(14), ABFM (17), ACGN(13) ACGO(14)...
Q	---------------- ... ADJQ(17)
K	ABEK(18), ABF(14), ABFM(17), ACGN(13), ACGO(14),

Till now, nobody is shorter than ADI(16, ADJQ(17)

the known viable path $\boxed{ACGN(13)}$.

e) hill climbing

NOT HEURISTIC!

Node	Queue
A	~~AC(4)~~ A(0)
~~B~~	~~ADE AB(8)~~
D	AD (1)
I	ADI (2)

↳ Stuck on local maximum.

f) local beam

Node	Queue
A AND H	A , H
D AND P	AD , HP local maximum
I AND ⊗ done	ADI , HP

Both ends up landing local maxima

2. from previous examples, uniform cost, A* are able to find optimal solutions.

3.3

1. I will need :

- word length
- ~~wor~~ All the letters in a word that also occured in other words.
- The ~~reoccurri~~ location ~~ca~~ of those reoccuring letters in each ~~of~~ word.
- Shouldn't be shorter than 3 letters shouldn't be longer than 6 letters.

words

map

- a ~~tree~~ structure contains the space with length marked
- a mapping structure that remembers where the row and column share space / letter. Ex. (1D(3),2R(2)