

Mid-sem2 Solutions and Rubrics

- 1.
2. Multiple solutions possible. For part b) any graph with negative weight cycles suffice and for both part a) and part b) we need to keep in mind that we don't visit the visited state again in dijkstra. Partial marks are given for genuine attempts.
3. Part a: Induction or any other correct strategy (3 marks)
Part b: Correct forward direction proof (1.5 marks)
Correct backward direction proof (1.5 marks)
4. The solution for all the parts can be found in this wiki link
https://en.wikipedia.org/wiki/Havel%E2%80%93Hakimi_algorithm

	Marks
Part 1.	2 marks. No partial marking.
Part 2.	3 marks- A is graphic $\Rightarrow A'$ is graphic. 1 mark- A' is graphic $\Rightarrow A$ is graphic.
Part 3.	4 marks
Part 4.	2 marks

5. Solution to this question can be found here:
https://canvas.dartmouth.edu/courses/44468/files/7408197?module_item_id=448707

(12 marks) Grading rubric

Part 1. (2 marks)

(1 marks) Correct max-flow value = 21

(1 marks) Correctly specified value of flow function for every edge

Part 2. (8 marks)

(1.6 marks/ iteration) For each correct iteration student will get 1.6 marks. Marks shall be deducted if someone skips or incorrectly answers any iteration

Some partial marks are given wherever necessary

Part 3. (2 marks)

(1 marks) For correct explanation of how the algorithm terminates: Algorithm will converge only near (never exactly) to the actual max flow value

(1 marks) Suitable justification for provided answer