In the following problems, use the basic graph exploration algorithms from class such as Explore, DFS, undirected connected components, topological sorting a DAG, BFS, SCC, Dijkstra's (with min-heap implementation), as black-box subroutines.
For the MST algorithms (Prim's and Kruskal's) and max-flow algorithms (Ford-Fulkerson and Edmonds-Karp) the problem will make clear whether or not you are allowed or expected to use these algorithms.
Explain your algorithm in words (no pseudocode). Be sure to state clearly the following:

1. Which black-box algorithm from class does your algorithm utilize?
2. How many runs of the black-box algorithm does your algorithm do?
3. What is the input to the black-box algorithm for each of these runs?
4. How do you transform the output from the black-box algorithm to get the solution to the exam problem?
5. What is the running time, in $O()$, of your algorithm in terms of $n = |V|$ and $m = |E|$? Don't say it's the same as DFS, etc.

Problem 1. Short answer. [5 points each]
No explanations, it's all or nothing for each part.

Part (a)._____

Part (b)._____

Part (c)._____

Part (d)._____

Problem 2. MST. [20 points]

Problem 3. Max-flow. [20 points]

Problem 4. Graph algorithms. [20 points]

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