

List of Topics for Math 181 Section B1 Exam 1

Exam 1 covers the first three chapters of the textbooks and all the lectures from the beginning of the semester to September 29th.

Before writing Exam 1, I looked through my lecture notes and compiled the following list of terms and concepts. While writing this exam, I looked at this list, the homework assignments and the quizzes. Notice that an entry like “minimal cost spanning tree” refers to three different things:

- What is a “minimal cost spanning tree”?
- What is the idea behind this? Why/When would a person look at this?
- How would one find a “minimal cost spanning tree”?

In other words, you should know the definition, understand the concept, and be able to do the corresponding problem.

Mainly Chapter 1: August 25th to September 5th

Edge. Vertex. Graph. Path. Circuit
Euler Circuit. Euler Path. Valence. Connected. Euler’s Theorem
Finding Euler Circuits. Eulerizing Graphs. “Squeezing” eulerized graphs onto the original graph. The Chinese Postman Problem

Mainly Chapter 2: September 5th to September 15th

Hamiltonian Circuit. Complete Graphs K_n . $K_{m,n}$.
Fundamental Principle of Counting.
Brute Force Method. Algorithm. Heuristic Algorithm. Greedy Algorithm.
Weighted Graphs. Travelling Salesman Problem.
Nearest Neighbour Method. Sorted Edges Method.
Tree. Spanning Tree. Minimal Cost Spanning Tree. Kruskal’s Algorithm.
Order Requirement Digraph. Critical Path.

Mainly Chapter 3: September 15th to September 29th

Machine-Scheduling Problem. Ready task.
Priority List. Priority List Processing Algorithm.
Optimal Schedules.
Critical Path Scheduling.
Independent tasks. Decreasing-Time-List Algorithm.
Bin-packing Problem. NF/FF/WF/NFD/FFD/WFD.
Four Color Theorem. Graph Colorings. Chromatic Number.
Conflict Resolution.