

## Quiz 2 Information

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MATH2069/2969: Discrete Mathematics and Graph Theory

Semester 1, 2011

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**Time:** 3.05–3.35pm, Thursday May 19, 2011

**Place:** Carslaw, 159

**Information:**

1. No books or materials are permitted, so all you need to take out from your bags is a pen, a calculator (if you want – you may not need it) and your student ID card. Answers written in pencil will not be marked.
2. There will be plenty of blank space and room on the quiz paper to do working, but only the answers (to be written in the boxes provided) will be marked.
3. The questions will be of the same kind as those in the practice classes. This includes questions asking you to repeat crucial principles or give definitions of key objects.
4. Numerical answers can be left unevaluated (as long as the expression is closed and short enough to fit in the answer box), e.g.  $\binom{4}{2}$  would be sufficient instead of 6.
5. The quiz is 30 minutes long. No-one may leave in the final 10 minutes.
6. At the conclusion of the quiz you will be asked to stop writing, and remain in your seats while your papers are collected.

**Material to be covered:** the content of Chapter 1 (First Properties of Graphs), Chapter 2 (Special Walks in Graphs), and Chapter 3 (Trees) in the notes “Introduction to Graph Theory”. This was covered in the first four weeks of the graph theory half. In particular, you should revise Practice Classes 1–4 and the following:

Number of graphs with fixed vertex set, isomorphism of graphs, complement of a graph, walks, connected graphs and connected components, subgraphs, paths, cycles, bridges, minimum and maximum number of edges in a connected graph, degrees of vertices, degree sequence, regular graphs, Handshaking Lemma, graphic sequences, Havel-Hakimi Theorem, Eulerian circuits and trails and the criteria for their existence, Hamiltonian graphs, necessary and sufficient criteria for a graph to be Hamiltonian, weighted graphs, minimal walks, Dijkstra’s Algorithm, Chinese Postman Problem, Travelling Salesman Problem, trees and forests, number of edges in a tree, Cayley’s Formula, Prüfer sequences, spanning trees, BFS and DFS Algorithms, Prim’s Algorithm, Matrix-Tree Theorem.

Predominantly the quiz questions will be at the un-starred level of difficulty.