Do not turn this page until you have received the signal to start.

In the meantime, please read the instructions below carefully.

This final examination paper consists of 6 questions on 11 pages (including this one), printed on one side of the paper. When you receive the signal to start, please make sure that your copy is complete and fill in the identification section above.

Answer each question directly on the exam paper, in the space provided, and use the reverse side of the previous page for rough work. If you need more space for one of your solutions, use the reverse side of the previous page and indicate clearly the part of your work that should be marked.

In your answers, you may use without proof any result covered in lectures, tutorials, homework, tests, or the textbook, as long as you give a clear statement of the result(s) you are using. You must justify all other facts required for your solutions.

Write up your solutions carefully! In particular, use notation and terminology correctly and explain what you are trying to do—part marks will be given for showing that you know the general structure of an answer, even if your solution is incomplete.

**Marking Guide**

# 1: _____/ 5
# 2: _____/13
# 3: _____/17
# 4: _____/ 8
# 5: _____/12
# 6: _____/10

Bonus Marks: _____/ 4

TOTAL: _____/65

Good Luck!