THE UNIVERSITY OF AUCKLAND

FIRST SEMESTER, 2001
Campus: City

MATHEMATICS

An introduction to basic set theory

(Time allowed: THREE hours)

NOTE: Attempt any **THREE** questions

1. Assume ZF is consistent. Prove that ZFC is consistent.

2. (a) Prove that Tychonoff's Theorem is equivalent to the Axiom of Choice.
   (b) Assume that all Dedikind-finite sets are finite. Show that every cardinal is comparable with ω.

3. Show that if there is a free ultrafilter on some set which is countably complete, then there is a measurable cardinal.