

CS206 Spring 2005 Quiz 1

Time: 15 mins

Total marks: 10

- *The exam is open book and notes.*
- *Results/proofs covered in class/problem sessions/assignments may simply be cited, unless specifically asked for.*
- *Unnecessarily lengthy solutions will be penalized.*
- *If you need to make any assumptions, state them clearly.*
- *Do not copy solutions from others or indulge in unfair means.*

1. [5 marks] Let $\phi = ((x_1 \leftrightarrow x_2) \leftrightarrow (x_3 \leftrightarrow x_4))$ be a propositional logic formula. Give an equisatisfiable CNF formula without converting ϕ to a truth table, or without using the Law of Excluded Middle.
2. [5 marks] Show that $\phi_1 \rightarrow (\phi_2 \rightarrow \phi_3) \vdash (\phi_1 \wedge \phi_2) \rightarrow \phi_3$ using natural deduction, without using the Law of Excluded Middle.