2005 Paper 5 Question 11

Semantics of Programming Languages

(*a*) Give a call-by-name small-step operational semantics and typing rules for the syntax below.

$$e \quad ::= \quad \textbf{fn } x \Rightarrow e \mid e_1 \ e_2 \mid x$$

[5 marks]

(*b*) State and prove Determinacy.   [6 marks]

(*c*) State and prove Type Preservation.   [9 marks]

Any standard lemmas you use must be stated precisely, but need not be proved.