2003 Paper 7 Question 10

Topics in Concurrency

(*a*) Prove that if two states in a finite transition system satisfy the same assertions in the modal μ-calculus, then they are strongly bisimilar. [10 marks]

(*b*) Describe a Petri net semantics for the following fragment of CCS:

$$t ::= rec\ x\ \alpha.s \mid t_1 \parallel t_2 \mid t \setminus b$$

in which

$$s ::= x \mid \alpha.s \mid s_1 + s_2$$

where α ranges over the actions of CCS, b over non-τ actions and x over process variables.

A diagrammatic account suffices, though you should make clear the form of labelled Petri net you are using and its "token game". Although no proof is needed, your semantics should represent the independence of actions in a parallel composition and agree with the usual transition semantics of CCS.

[10 marks]