1999 Paper 2 Question 2

Digital Electronics

An *arbiter* is a functional unit that allows requesters to lock resources while they are in use.

(*a*) Describe the inputs and outputs of an arbiter for a single resource which has two requesters.   [5 marks]

(*b*) Describe *two* policies that the arbiter might implement when both requesters request the resource simultaneously. One of these should require some internal state.   [5 marks]

(*c*) Give a state diagram for a policy which requires internal state assuming synchronous operation.   [5 marks]

(*d*) Choose *one* of the policies in (*b*) and derive equations for outputs and next state control using any type of storage element you choose.   [5 marks]