

1999 Paper 11 Question 12

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]