

2001 Paper 11 Question 1

Digital Electronics

A resource is managed by a system that allocates it to at most one of four requesters for one cycle at a time. The resource is allocated in a “round robin” fashion, so that for example if requester 2 last had the resource, requester 3 has highest priority to acquire it, followed by, in order, requesters 0, 1 and 2. If no one requests the resource it is not allocated, but the system still remembers who last had the resource.

- (a) Define input and output variables for the system. [3 marks]
- (b) Describe state variables for the system. [3 marks]
- (c) Provide equations for the state control and outputs. [10 marks]
- (d) Find a minimal sum of products expression for *one* of the outputs. [4 marks]