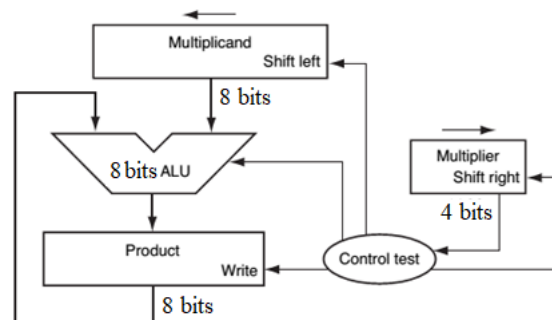


*DURATION: 90 minutes**(Students are **allowed** to use any documents,
but not electronic devices.)*

1. Given the following state/output table: (5 đ)

Present State	Next State/Output		
	AB = 00	AB = 01	AB = 10
S0	S4/1	S2/0	S1/1
S1	S2/0	S5/1	S4/1
S2	S1/1	S0/0	S3/1
S3	S2/0	S5/1	S4/1
S4	S0/0	S5/1	S1/1
S5	S2/0	S4/1	S2/1

- Minimize the states for the above FSM (1 đ)
 - Drive state encoding using the minimum-bit-change heuristic (1 đ)
 - Draw FSM diagram using Moore model (1 đ)
 - Design circuit using Moore model (2 đ)
2. Design a 4x4 register file with two write ports and two read ports. (3đ)
3. Given the circuit of the 4-bit multiplication as following



Using FSM, design the Control test module (3 đ)