

UNIVERSITY OF THE WEST INDIES
CAVE HILL CAMPUS

Department of Computer Science, Mathematics & Physics

ELET1215 - Digital Electronics 2

Class Test 1

Monday, February 28, 2022

THIS PAPER HAS TWO (2) PAGES AND FOUR (4) QUESTIONS
ANSWER ALL QUESTIONS

1. For the implication table below, draw a merger diagram and use it to find the maximal compatibles. [10]

b	✓						
c	X	✓					
d	X	d,e x	✓				
e	✓	✓	d,e x	X			
f	✓	✓	X	X	✓		
g	c,f x	d,e x	d,e x c,f x	X	X	X	
h	c,f x	✓	✓	d,e x c,f x	d,e x c,f x	d,e x c,f x	X
	a	b	c	d	e	f	g

2. For the flow table below, draw a transition diagram and use it to make a race free state assignment, show your transition table and output map, assign outputs to the unstable states and simplify your output function. [10]

		X1 X2			
		00	01	11	10
a	b, _	(a),0	(a),0	b, _	
b	(b),0	a, _	c, _	(b),1	
c	(c),1	d, _	(c),1	d, _	
d	c, _	(d),0	a, _	(d),1	

3. For the state equations below:

$$Y1 = y2 \cdot \bar{x1} + \bar{y1} \cdot y2 \cdot x2 + y1 \cdot \bar{x1} \cdot \bar{x2} + y1 \cdot \bar{y2} \cdot x1 \cdot x2$$

$$Y2 = y2 \cdot \bar{x1} + y1 \cdot \bar{x1} + x1 \cdot \bar{x2} + \bar{y1} \cdot \bar{x1} \cdot \bar{x2}$$

Derive the transition table

[10]

4. For the Transition Table below:

(a) Identify any races and determine if they are critical or not

[8]

(b) Identify any cycles

[2]

		X ₁ X ₂			
		00	01	11	10
y ₁ y ₂	00	00	10	11	00
	01	01	11	11	10
	11	10	11	11	00
	10	01	01	11	10