CS2100 Computer Organisation
AY2021/22 Semester 1
Assignment 2 Answer Sheet

FULL NAME:	
STUDENT ID: E.g., <AxxxxxxxY>	
TUTORIAL GROUP:	

Question 0. Submission instructions (3 marks)

a. Name your file with your student number (eg: AxxxxxxxY>.pdf). (1 mark)	**Y / N**
b. Submit your assignment as a single PDF file. (1 mark)	**Y / N**
c. Your submission has your tutorial group number, student number and name. (1 mark)	**Y / N**

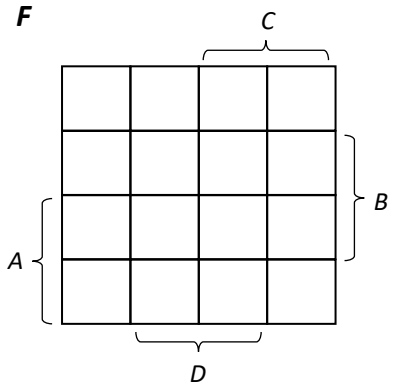
Question 1. Datapath (8 marks)

Field	Value
RegDst	
MemRead	
MemWrite	
ALUSrc	
RegWrite	
Instruction[31-26] *	0b
Instruction[25-21] *	0b
Instruction[20-16] *	0b
Instruction[15-11] *	0b
Instruction[5-0] *	0b
❶ * (output from sign-extend)	0x
❷ *	0x
❸ *	0x
❹ * (read data 2)	0x
❺ *	0x
❻ (ALU control output)	

Question 2. Simplification (14 marks)

(a) $B \cdot Y \cdot E' \cdot (A' \cdot X + A \cdot X' + A \cdot X + A' \cdot X') + B' \cdot L \cdot U \cdot E' \cdot S' \cdot K \cdot Y + Y \cdot E' \cdot S'$ [6 marks]

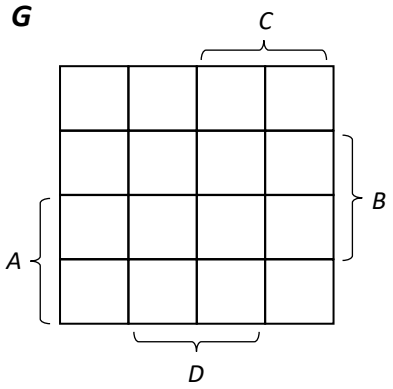
(b)



[4 marks]

#PIs	
#EPIs	
Simplest SOP	
Simplest POS	

(c)

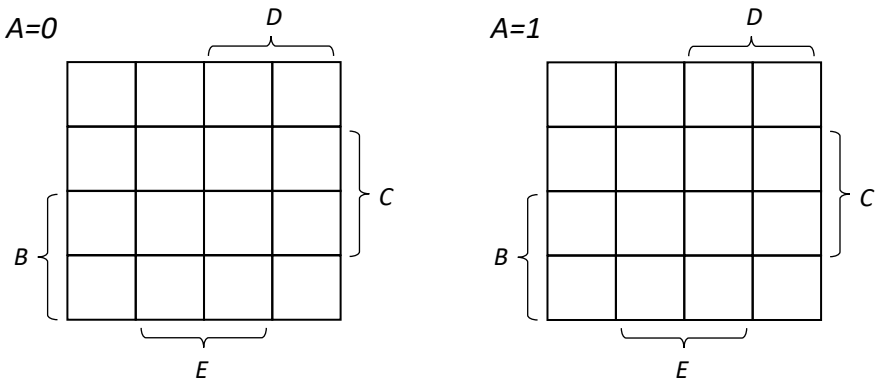


[4 marks]

#PIs	
#EPIs	
Simplest SOP	
Simplest POS	

Question 3. Circuit Design (8 marks)

(a) [2 marks]

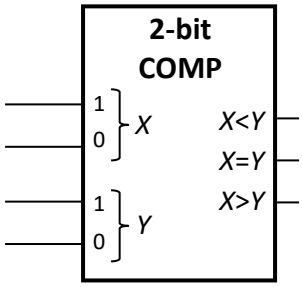


(b) Write out the simplified SOP expression for *M*. [3 marks]

c) Draw the circuit for *V*. [3 marks]

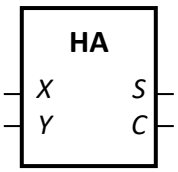
Question 4. Block-level design (7 marks)

(a) $F(A,B,C,D) = \Sigma m(1, 4, 5, 6, 7, 13)$ [3 marks]



(b) $G(A,B,E) = \Sigma m(3,5)$

$H(A,B,E) = \Sigma m(1,2,4,6)$ [4 marks]



A	*B*	*E*					
0	0	0					
0	0	1					
0	1	0					
0	1	1					
1	0	0					
1	0	1					
1	1	0					
1	1	1					

(Add more columns to the table if there are insufficient columns.)