

Sample B

**Question 1 (Use Boolean Algebra for Question 1)**

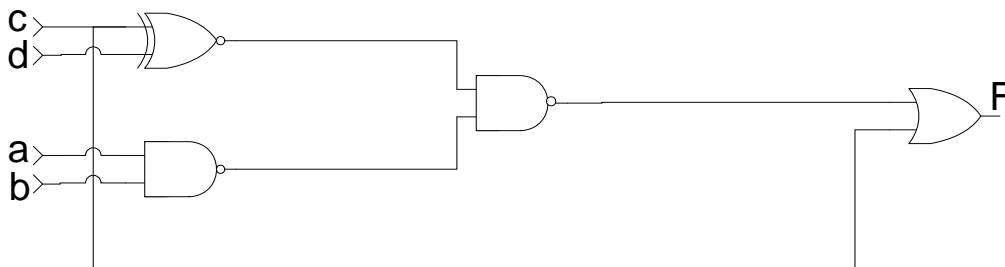
1.a Simplify to obtain minimum SOP (2 marks)

$$F(A, B, C, D) = A'CD' + BCD' + ACD' + ABC' + BC'D + ABC$$

1.b Simplify to obtain minimum SOP (2 marks)

$$F(A, B, C, D) = (1 \cdot D')D + A + A'B'(1 + C')$$

1.c Minimize the following circuit, Give minimum circuit in **NAND-NAND** Form. (3 marks)



**Question 2**

a) Give **minimal SOP** for F(a,b,c,d) given by the following K-map (2 marks)

Identify the prime Implicants clearly. Give an AND-OR-NOT implementation.

		ab			
	cd	00	01	11	10
00		X	1	1	X
01		1	1	X	
11		1			
10		X	X	X	
		--			

b) Give **minimal NOR-NOR** implementation for F(a,b,c,d) given by the following K-map (2 marks).

		ab			
	cd	00	01	11	10
00			X	X	X
01				X	
11		X			
10		1	1	1	X

**Question 3**

In the circuit below:  
Delay of inverter = 4ns  
Delay of AND = 8ns  
Delay of OR = 10ns  
Input of the circuit goes from  $ab = 00$  to  $10$  draw timing diagram for the circuit. (4 marks)

