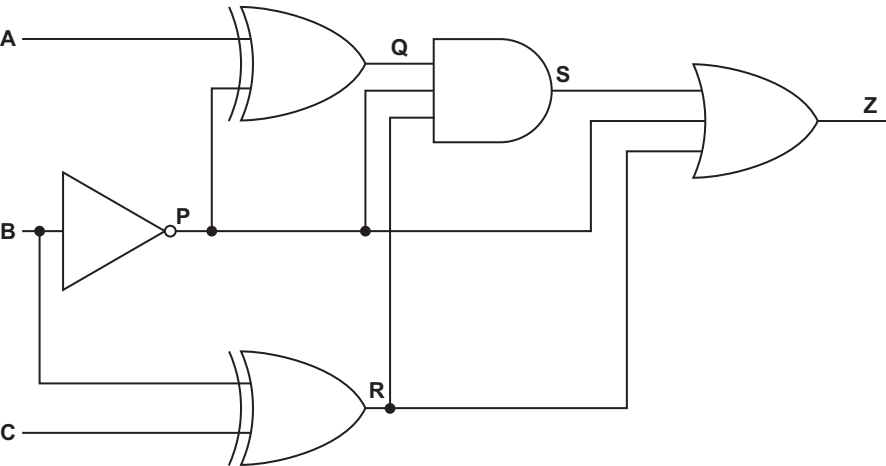


6 (a) The diagram shows a logic circuit.



Complete the truth table for the given logic circuit.
Show your working.

			Working space				
A	B	C	P	Q	R	S	Z
0	0	0					
0	0	1					
0	1	0					
0	1	1					
1	0	0					
1	0	1					
1	1	0					
1	1	1					

[3]

(b) (i) Complete the Karnaugh map (K-map) for the Boolean expression:

$$\bar{A}\bar{B}.C + \bar{A}.B.C + A.\bar{B}.C + A.B.\bar{C}$$

		BC			
A		00	01	11	10
	0				
	1				

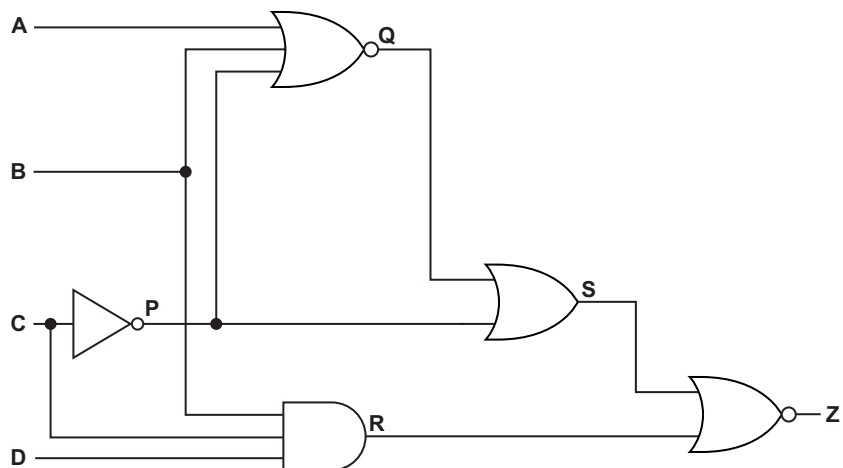
[2]

(ii) Draw loop(s) around appropriate group(s) in the K-map to produce an optimal sum-of-products. [2]

(iii) Write the Boolean expression from your answer to part b(ii) as a simplified sum-of-products. Do **not** carry out any further simplification.

.....
..... [2]

7 The diagram shows a logic circuit.



- (a) Complete the truth table for the given logic circuit. Show your working.

				Working space				
A	B	C	D	P	Q	R	S	Z
0	0	0	0					
0	0	0	1					
0	0	1	0					
0	0	1	1					
0	1	0	0					
0	1	0	1					
0	1	1	0					
0	1	1	1					
1	0	0	0					
1	0	0	1					
1	0	1	0					
1	0	1	1					
1	1	0	0					
1	1	0	1					
1	1	1	0					
1	1	1	1	③				

- (b) Write the Boolean logic expression that corresponds to the given logic circuit as the sum-of-products.

$$Z = \dots\dots\dots [1]$$

- (c) Use Boolean algebra including De Morgan's laws to simplify the following expression. Show all working.

$$(\overline{A + B}) \cdot (\overline{A \cdot B} + \overline{B \cdot C})$$

Working

Simplified expression

.....

[4]

6 The truth table for a logic circuit is shown.

INPUT				OUTPUT
A	B	C	D	X
0	0	0	0	0
0	0	0	1	1
0	0	1	0	1
0	0	1	1	0
0	1	0	0	0
0	1	0	1	1
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	1
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	1
1	1	1	1	0

(a) Write the Boolean logic expression that corresponds to the given truth table as the sum-of-products.

X =
 [3]

(b) Complete the Karnaugh map (K-map) for the given truth table.

		AB			
		00	01	11	10
CD	00				
	01				
	11				
	10				

[2]

(c) Draw loop(s) around appropriate group(s) in the K-map to produce an optimal sum-of-products. [2]

(d) Write the Boolean logic expression from your answer to part (c) as the simplified sum-of-products.

X =
 [2]

8 Complex Instruction Set Computer (CISC) is a type of processor.

Identify **four** features of a CISC processor.

- 1
- 2
- 3
- 4

[4]

2 Reduced Instruction Set Computers (RISC) is a type of processor.

Identify **four** features of a RISC processor.

- 1
-
- 2
-
- 3
-
- 4
-

[4]