

**Student BGN.....**

**Paper.....**

**Question number.....**

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**How did you answer this question?**

Timed

Open Book

Untimed

Closed Book

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**Questions**

List all the questions you have answered for this paper here.

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**Computer Science Tripos Honour Code**

- 1. We take it as a principle that maintaining the integrity and fairness of examinations should be regarded as a collaboration between students and the Department.**
- 2. The students undertake that they will not help others in examinations and will not receive any help from others (students or non-students).**
- 3. Students will actively contribute to ensuring that all students adhere to the code.**
- 4. Students will keep to the conditions of the assessment and will accurately report those conditions when asked.**
- 5. The Department will not make any attempt at remote invigilation of online examinations.**

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**I undertake to respect the Computer Science Tripos honour code**

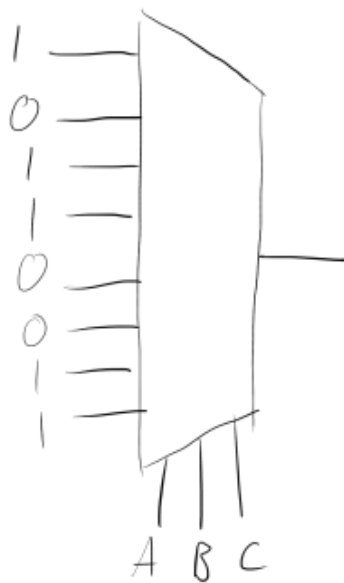
Tick the box to confirm

1a)

$$\begin{aligned} X &= \overline{A}.B.C + \overline{B}.\overline{C} + B.C \\ &= \overline{B} + C + B.C \\ &= \overline{B} + C \end{aligned}$$

$$\begin{aligned} Y &= \overline{(A+B+C)}.D + A.D + B \\ &= \overline{A}.\overline{B}.\overline{C}.D + A.D + B.D + B \\ &= (\overline{A}.\overline{B}.\overline{C} + A + B).D + B \\ &= (\overline{C} + A + B).D + B \\ &= A.D + B + \overline{C}.D \end{aligned}$$

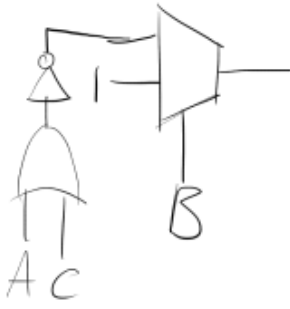
b) (i)



(ii)



(iii)



c)

(i)

$I_7$	$I_6$	$I_5$	$I_4$	$I_3$	$I_2$	$I_1$	$I_0$	$O_2$	$O_1$	$O_0$	None
0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	1	0	0	0	0
0	0	0	0	0	0	1	x	0	0	1	0
0	0	0	0	0	1	x	x	0	1	0	0
0	0	0	0	1	x	x	x	0	1	1	0
0	0	0	1	x	x	x	x	1	0	0	0
0	0	1	x	x	x	x	x	1	0	1	0
0	1	x	x	x	x	x	x	1	1	0	0
1	x	x	x	x	x	x	x	1	1	1	0

(ii)

$$O_2 = I_4 + I_5 + I_6 + I_7$$

$$O_1 = I_2 + I_3 + I_6 + I_7$$

$$O_0 = I_1 + I_3 + I_5 + I_7$$

$$\text{None} = \overline{I_0 + I_1 + I_2 + I_3 + I_4 + I_5 + I_6 + I_7}$$