AQA Computer Science A-Level

4.6.5 Boolean algebra

Past Paper Questions

January 2010 Comp 2

2 Simplify the Boolean expression:

$$\overline{A \cdot B} + A$$

Show your working.

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(3 marks)

January 2011 Comp 2

3 Write the following Boolean expressions in their simplest forms.

3 (a) $(\overline{\overline{A} \cdot \overline{B}})$

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(1 mark)

3 (b) $B + B \cdot \overline{C}$

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(1 mark)

3 (c) $A \cdot B + A \cdot \overline{B}$

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(1 mark)

3 (d) $A \cdot (B+1)$

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(1 mark)

January 2012 Comp 2

2 (d) **Without** using a truth table, simplify the Boolean expression below.

$(X + Y) . (X + \overline{Y})$

Show the stages of your working.

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(3 marks)

Final answer .....

(1 mark)

January 2013 Comp 2

4 (c) What is the name commonly associated with the statement $A + B = \overline{\overline{A} . \overline{B}}$?

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(1 mark)

4 (d) Simplify the Boolean expression below.

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

Show each stage of your working in the space below.

(2 marks)

Final answer .....

(1 mark)

June 2010 Comp 2

9 (c) Simplify the Boolean expression:

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

Show your working.

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(3 marks)

June 2011 Comp 2

3 (c) Simplify the Boolean expression below.

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

Show each stage of your working.

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(3 marks)

Final answer .....

(1 mark)

June 2012 Comp 2

8 (c) Apply De Morgan's Law(s) to the following expression and simplify the result.

$$Q = \overline{\overline{A} + \overline{(B \cdot A)}}$$

Show the stages of your working.

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(2 marks)

Final answer .....

(1 mark)

June 2013 Comp 2

6 (b) Simplify the following Boolean expressions.

6 (b) (i) $B \cdot (A+\overline{A})$

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(1 mark)

6 (b) (ii) $A \cdot B + B$

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(1 mark)

6 (b) (iii) $\overline{B} \cdot (\overline{\overline{A}+\overline{B}})$

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(2 marks)

June 2016 AS Paper 2

0 3 Using the rules of Boolean algebra, simplify the following Boolean expression.

$$(\overline{A} + B).\overline{(A + (\overline{B + A}))}$$

You **must** show your working.

[4 marks]

June 2017 AS Paper 2

0 5 . 3 Using the laws of Boolean algebra, simplify the following Boolean expression.

$$(\mathbf{X} + \mathbf{Y}) \cdot (\mathbf{X} + \overline{\mathbf{Y}})$$

You **must** show your working.

[4 marks]

Answer: _____

June 2017 Paper 2

0 4 . 3 Using the rules of Boolean algebra, simplify the following Boolean expression.

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

You **must** show your working.

[4 marks]

June 2009 Comp 2

4 (c) Simplify the Boolean expression below, showing your working.

$$\overline{\overline{A} + \overline{B}} + B \cdot \overline{A}$$

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(3 marks)

Specimen AS Paper 2

0 9 . 2 Using the laws of Boolean algebra, simplify the following Boolean expression.

$$A.B.(A + B)$$

[3 marks]

Answer: _____

0 9 . 3 Using the laws of Boolean algebra, simplify the following Boolean expression.

$$(X + Y).(X + \overline{Y})$$

[3 marks]

Answer:

Specimen Paper 2

1 1 . 1 **Table 5** lists six Boolean equations. Three of them are correct, the others are not. Shade the lozenges next to the **three** equations are correct.

[3 marks]

Table 5

Equation	Correct? (Shade three)
$A \cdot \overline{A} = 1$	⬭
$A + B = \overline{\overline{A} \cdot \overline{B}}$	⬭
$A + 1 = 1$	⬭
$A \cdot (A + B) = A$	⬭
$A + (A \cdot B) = B$	⬭
$A \cdot 1 = 1$	⬭

1 1 . 2 Use Boolean algebra to simplify the following expression:

$$\overline{\overline{A} + \overline{B}} + B \cdot \overline{A}$$

Show your working.

[3 marks]

Answer: