

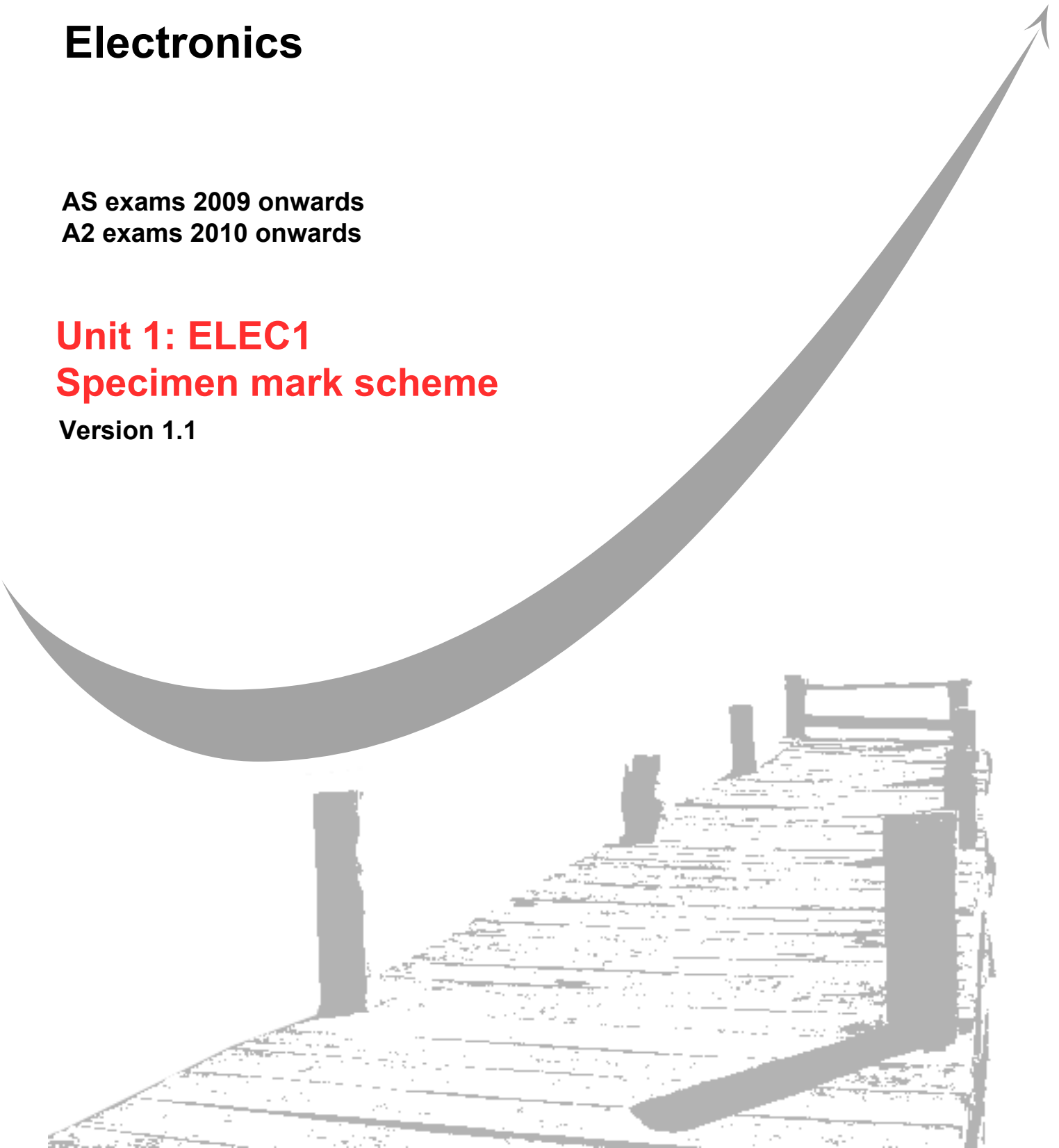
GCE
AS and A Level

Electronics

AS exams 2009 onwards
A2 exams 2010 onwards

Unit 1: ELEC1 **Specimen mark scheme**

Version 1.1



The specimen assessment materials are provided to give centres a reasonable idea of the general shape and character of the planned question papers and mark schemes in advance of the first operational exams.

For operational papers, mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. The mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

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Mark Scheme

1 (a) $X = \overline{A + B}$ ✓
 $Y = \overline{C}$ ✓ (3 marks)

(b) (i) $Q = X.Y$ ✓
(ii) $\overline{(A + B)} \cdot C$ ✓ (3 marks)

(c)

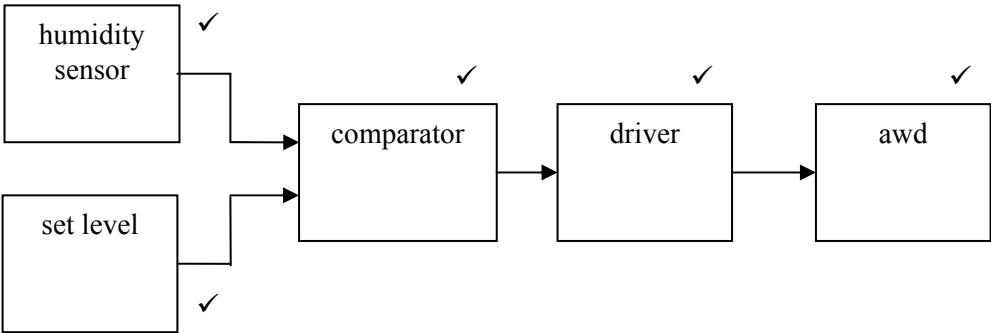
A	B	C	X	Y	Q
0	0	0	1	1	1
0	0	1	1	0	0
0	1	0	0	1	0
0	1	1	0	0	0
1	0	0	0	1	0
1	0	1	0	0	0
1	1	0	0	1	0
1	1	1	0	0	0

Four vertical curly braces on the right side of the table, each spanning two rows and ending with a checkmark (✓). The braces are positioned to the right of the Q column.

(4 marks)

(d) 3 i/p ✓ NOR gate ✓ (2 marks)
(question total 12 marks)

2 (a)

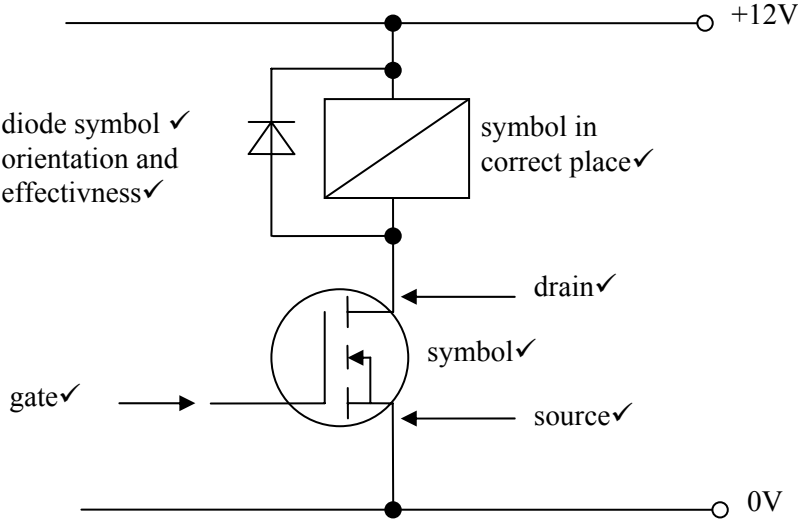


(5 marks)

- (b) (i) comparator✓
 - (ii) awd✓
 - (iii) driver✓ (3 marks)
 - (c) (i) $265 - 15 = 250 \text{ mA}$ ✓
 - (ii) $0.250 \times 12 = 3 \text{ W}$ ✓ ecf (4 marks)
- (question total 12 marks)

- 3 (a) resistor symbol✓ led symbol (correct bias)✓ series circuit to 0V✓ (3 marks)
- (b) (i) limits current✓
- (ii) $5 - 2.4 \text{ V} = 2.6 \text{ V}$ ✓
- (iii) convert 10mA to 0.01A✓ $2.6 \div 0.01 = 260 \Omega$ ✓ ecf
- (iv) 270Ω ✓ ecf
- (v) red✓ violet✓ brown✓ gold✓ ecf (11 marks)
- (question total 14 marks)

- 4 (a) (i) and (ii)



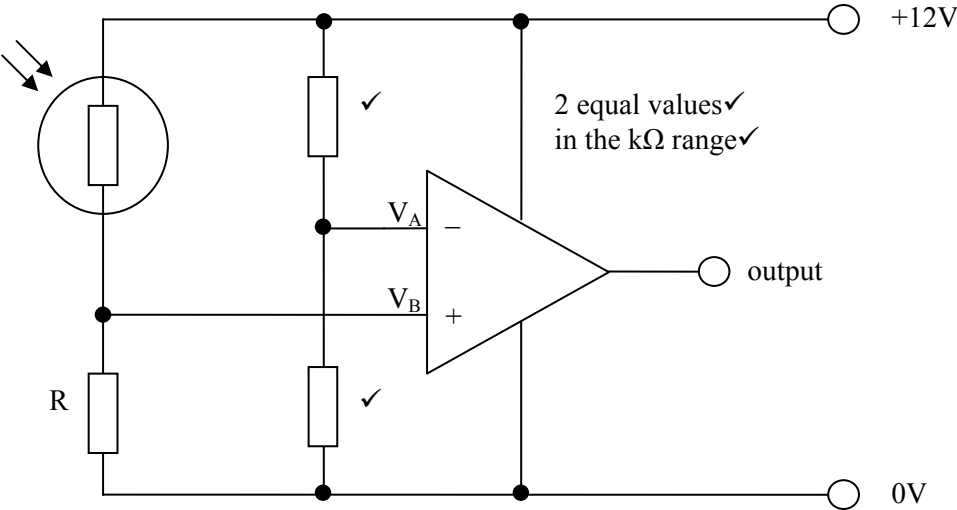
Alternative answers awarded equal credit. (7 marks)

(b)

	MOSFET off	MOSFET on
Gate voltage	0 – 2V✓	>2V✓
Gate current	0	0✓ (for both)
Drain voltage	12V✓	0V✓

(5 marks)
(question total 12 marks)

5 (a) (i) and (ii)



(4 marks)

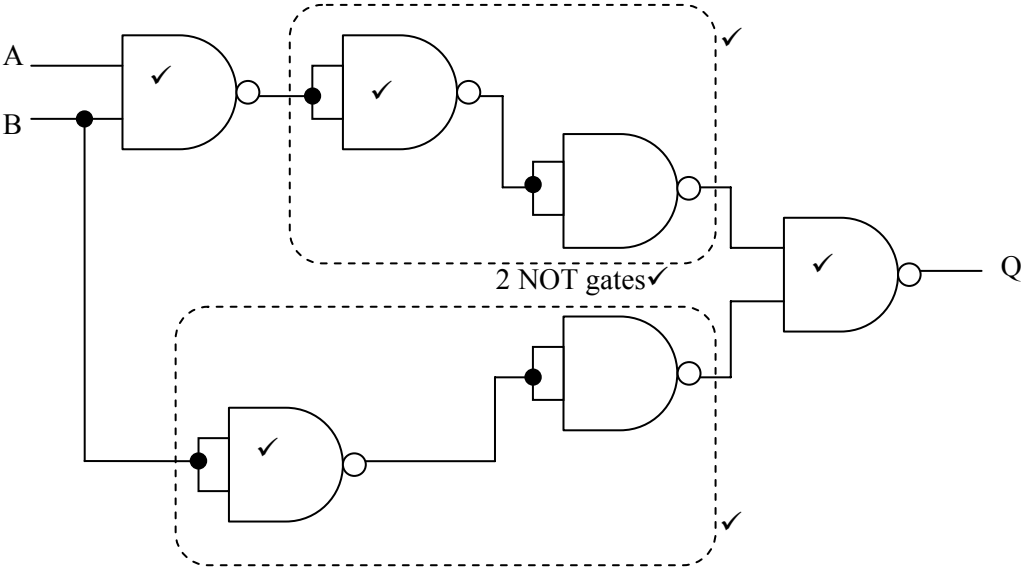
(b) 6V needed at V_B , $LDR = R$ ✓ $R = 10k\Omega$ ✓ (2 marks)

(c) (i) 9 – 12V✓

(ii) 0 – 3V✓

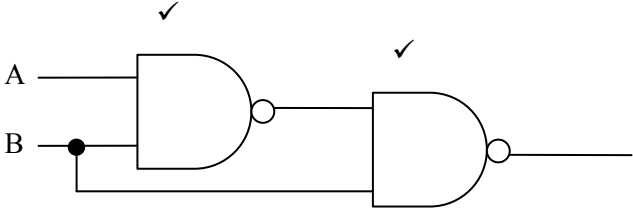
(2 marks)
(question total 8 marks)

6 (a) and (b)



(5 marks)
(2 marks)

(c)



(2 marks)
(question total 9 marks)