Version 1.0: 0807

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Electronics 3432

Tier F Foundation

Mark Scheme

2007 examination - June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This 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.

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Dr Michael Cresswell Director General

1 (a) transformer✓

(1 mark)

(b) fuse✓
circuit breaker (any type)✓

(2 marks)

(c) (i) green/yellow✓

(ii) brown✓

(iii) blue✓

(3 marks)

(d) Any two from; do not work alone/know first aid/know how to get help/carry out risk assessment (other answers possible) ✓✓

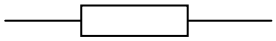
(2 marks)

(e) shock✓
paralysis✓
burning✓ (any two points)

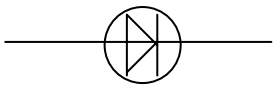
(2 marks)

(Total 10 marks)

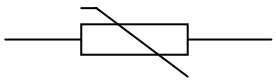
2



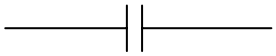
✓ limits current/voltage to current/ current to voltage✓



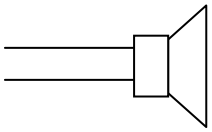
✓ current flows only one way✓



✓ input transducer/temperature to resistance✓



✓ stores charge/smoothes/blocks dc✓



✓ output transducer/current to sound✓

(10 marks)

(Total 10 marks)

3 (a) (i) light sensor✓

(ii) display✓

(iii) light sensor✓

(iv) latch✓

(4 marks)

(b) (i) latch✓

(ii) light sensor✓

(iii) ADC✓

(iv) display✓

(4 marks)

(c) (i) latch✓

(ii) display✓

(2 marks)

(Total 10 marks)

4 (a) OR✓
AND✓
NAND✓

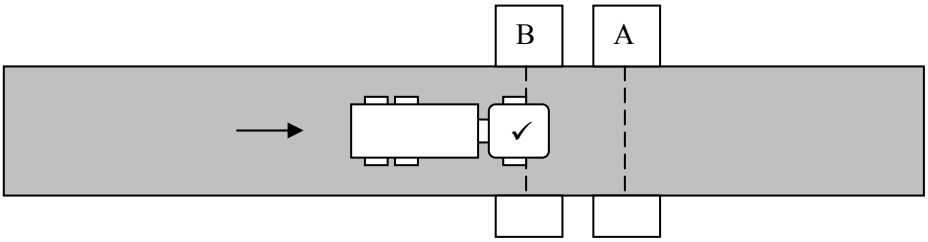
(3 marks)

(b)

A	B	C	D	Q
0	0	**0**	**1**	0
0	1	**1** ✓	**1** ✓	1
1	0	**1**	**1**	**1**✓
1	1	**1**	**0**	**0**✓
		✓	✓	

(6 marks)

(c)



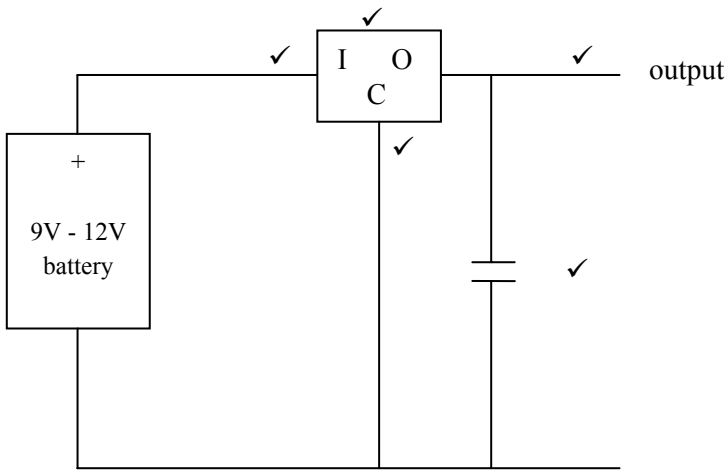
(1 mark)

(Total 10 marks)

5 (a) (three terminal) regulator IC ✓

(1 mark)

(b)



(5 marks)

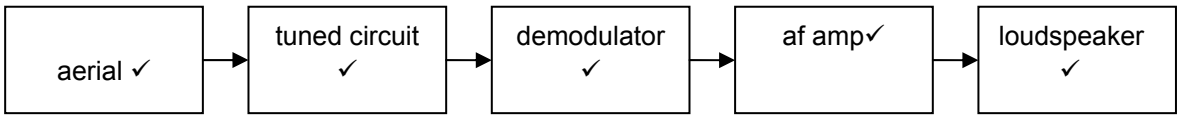
(c) (i) R = V ÷ I = 5 ÷ 0.25 = 20Ω✓✓

(ii) P = V × I = 5 × 0.25 = 1.25W✓✓

(4 marks)

(Total 10 marks)

6 (a)



(5 marks)

(b) (i) af amplifier✓

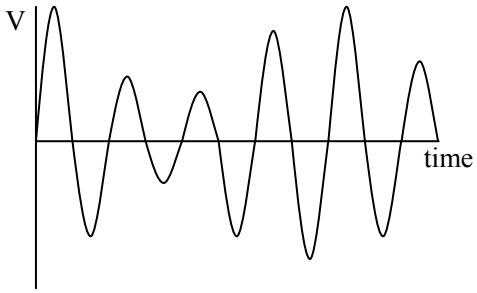
(ii) demodulator✓

(iii) tuned circuit✓

(3 marks)

(c)

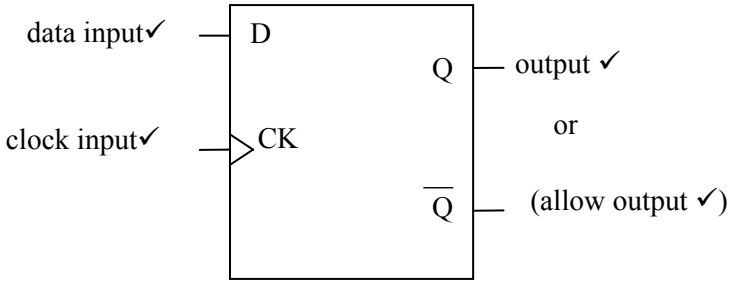
varying amplitude✓ constant carrier frequency✓



(2 marks)

(Total 10 marks)

7 (a)(i) and (ii)

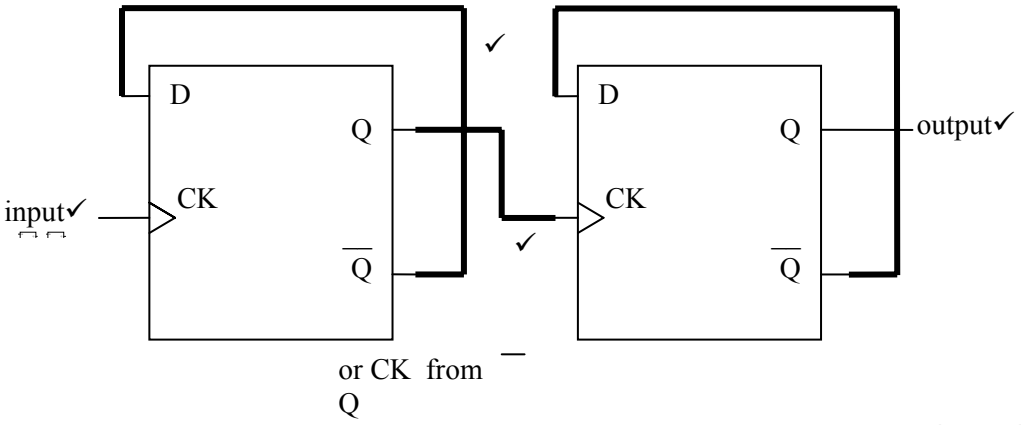


(3 marks)

(b) data present on the D input✓
is transferred to the Q output✓
when the clock signal goes high✓

(3 marks)

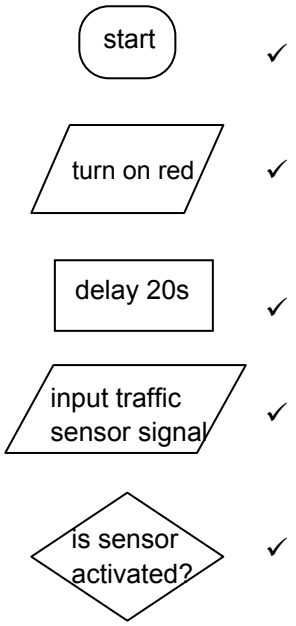
(c)



(4 marks)

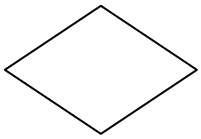
(Total 10 marks)

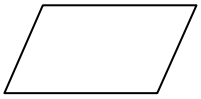
8 (a)



✓ ✓ ✓ ✓ ✓

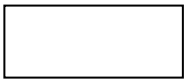
(5 marks)

(b) decision box  ✓

input box  ✓

a loop - any line that returns to a point earlier in the flow chart✓

output box  ✓

process box  ✓

(5 marks)

(c) (i) 23s✓

(ii) green on for 10s longer✓

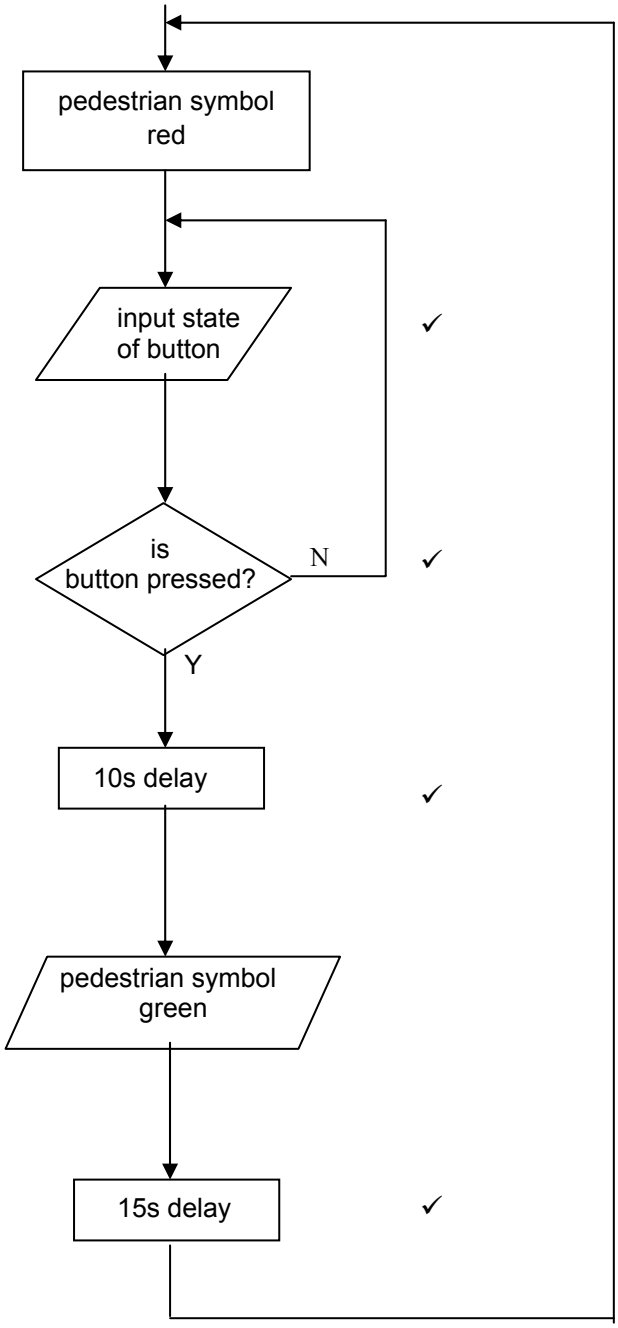
(iii) 2✓

(iv) 6s✓

(v) 56s✓

(5 marks)

(d)

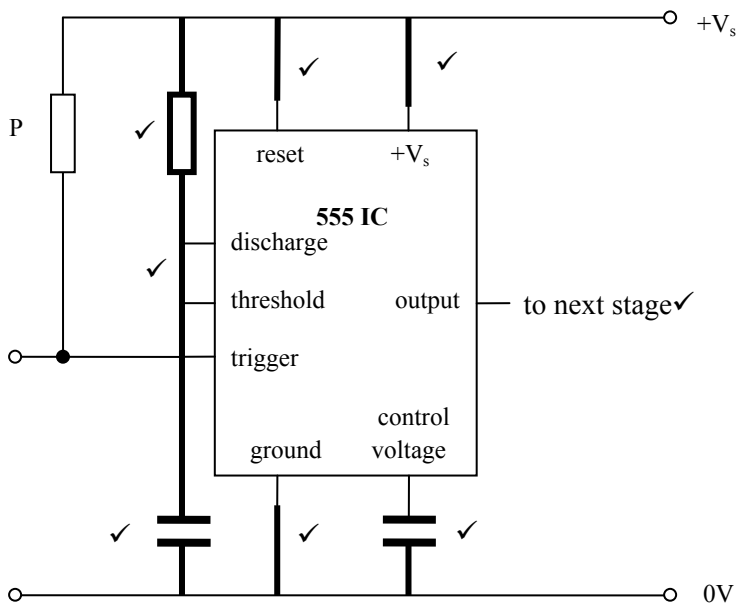


✓ ✓ ✓ ✓

(5 marks)

(Total 20 marks)

9 (a)



(8 marks)

(b) the maximum output current from logic gate or timer
is less than 450 mA (required by LED), or 12V o/p > 4V required✓

(1 mark)

(c) (i) 8V✓

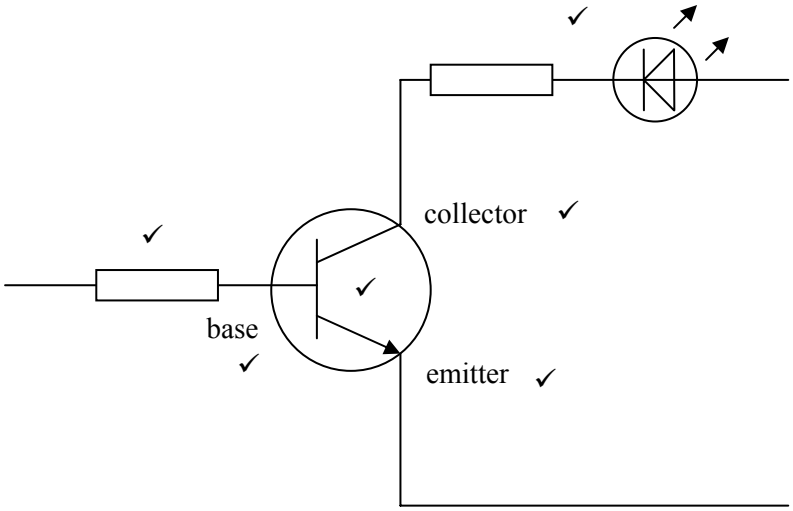
(ii) 450 mA✓

(iii) R = V ÷ I = 8 ÷ 0.45✓ = 17.77Ω✓

(iv) 18 Ω (allow 20 Ω) ✓

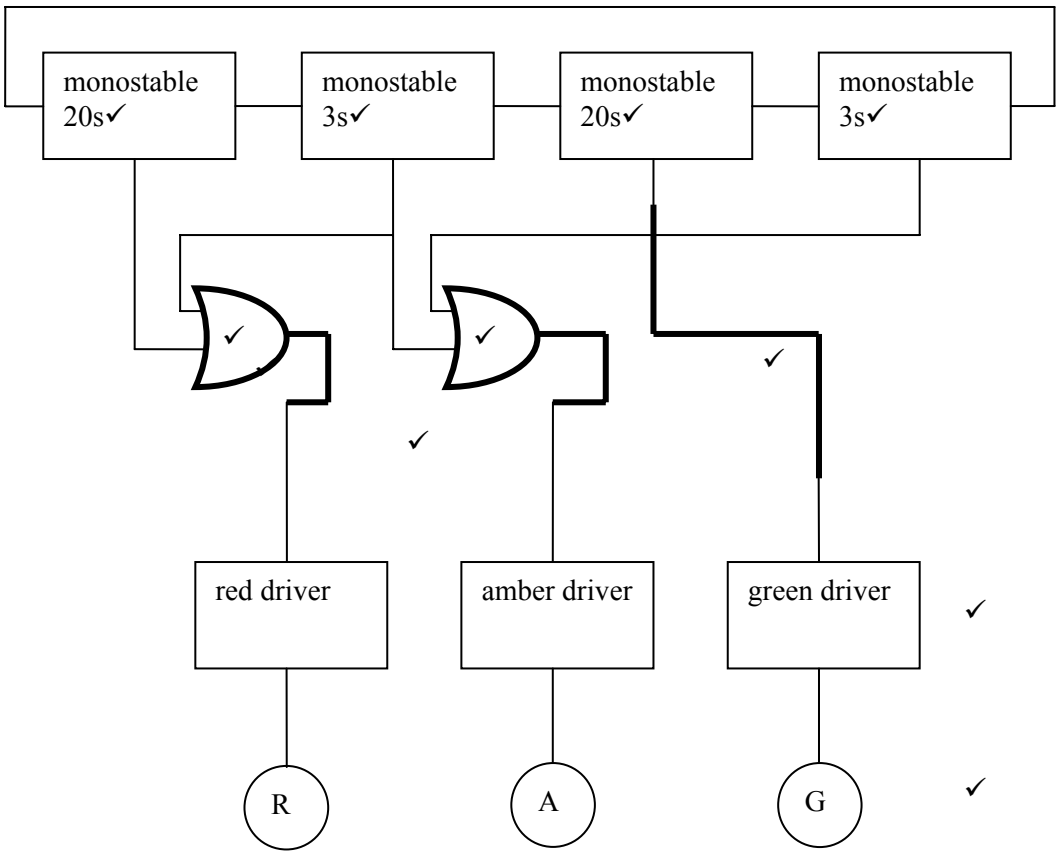
(5 marks)

(d)



(6 marks)

(e)



(10 marks)

(Total 30 marks)