Version 1.0

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Electronics 3432

Foundation Tier

Mark Scheme

2006 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.

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.

Foundation Tier

1 (a) Any five dangers from:
working alone
working on mains powered circuit
circuit live/plugged in
no earth
capacitor charged across mains incorrectly polarised
water near mains supply
soldering iron danger ✓✓✓✓✓ (5 max)

(b) shock related effect✓
burn related effect✓

(c) remove victim from mains✓ put in recovery position✓
resuscitation✓ get help✓ (max 3)

(10 marks)

2 (a) resistor✓
diode✓
LDR✓
thermistor✓
variable resistor✓

(b) (i) loudspeaker/buzzer✓
(ii) microphone✓
(iii) output✓ electrical✓ light✓

(10 marks)

3 (a) (i) temperature sensor✓
(ii) heater✓
(iii) comparator✓

(b) (i) comparator✓
(ii) temperature sensor✓

(c) transistor switch✓ electromagnetic relay✓ (any order)

(d) comparator output goes high (or changes) ✓
transistor switches relay ✓
relay switches on✓
heater switches on✓
(max 3)

(10 marks)

4 (a) NOR✓
OR✓
AND✓

(b)

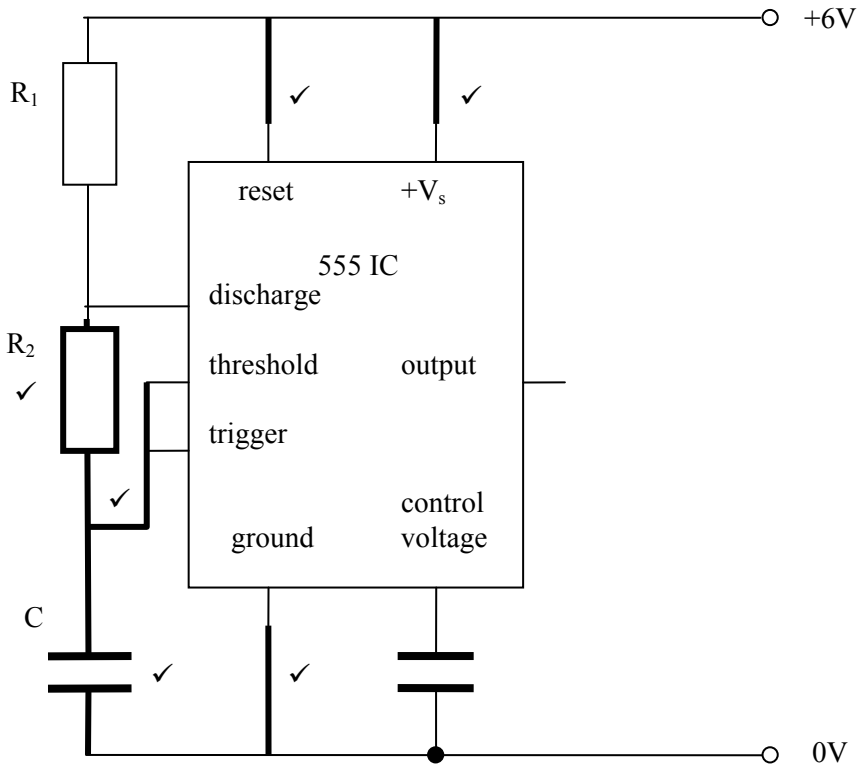
A	B	C	D	Q
0	0	**1**	**0**	**1**
0	1	**0**	**0**	**0** ✓
1	0	**0**	**0**	**0**
1	1	**0**	**1**	**1**
		✓	✓	✓

(c) open and cold✓ closed and warm✓ (or ecf)

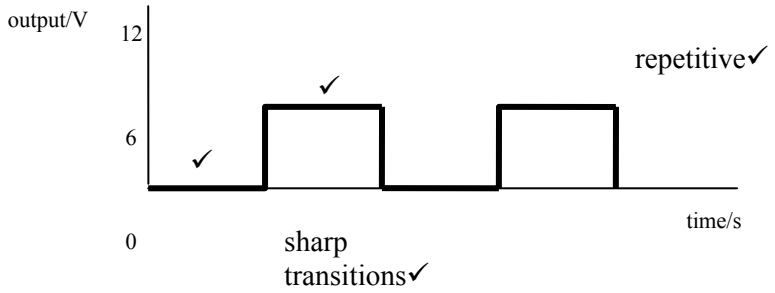
(d) Change OR gate to NOR, or add NOT gate to output✓

(10 marks)

5 (a)



(b)



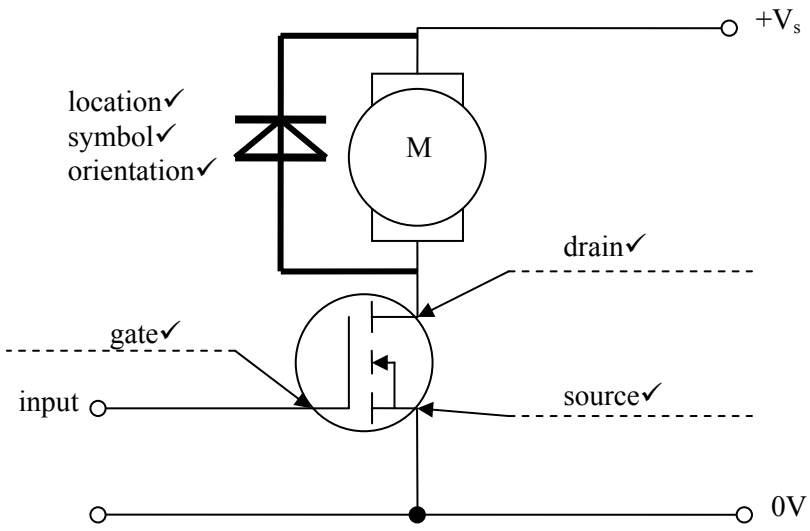
(10 marks)

6 (a) (i) radio waves✓ electrical signals✓
(ii) selects✓ wanted channel✓
(iii) modulated signal✓ audio frequency signal✓

(b) (i) increases✓
(ii) increases✓
(iii) no change✓
(iv) increases✓

(10 marks)

7 (a), (b)



(c) The gate itself has a high resistance, no extra resistance required/
MOSFET is a voltage operated device✓

(d) A bipolar transistor would need a large base current/
the MOSFET does not need gate current/
MOSFET has a very large current gain✓

(e) (i) 0 – 0.8V✓
(ii) 1 – 5V✓
(low – high = 1 mark only, specify V for 2nd mark.)

(10 marks)

(120 Total Marks)