AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

June 2003

GCSE

Electronics

3432

Foundation

Foundation Tier

1   (a)   top to bottom on diagram,   earth wire✓
                                       live wire✓
                                       fuse✓
                                       cord grip✓   (4)

    (b)   (i)   green/yellow✓
          (ii)   brown✓
          (iii) blue✓   (3)

    (c)   (i)   neutral wire✓
          (ii)   ensure no bare wire showing/ put further into terminal✓
          (iii) fuse has too large a value✓   (3)

                                                          (10 marks)

2   LED✓   output✓
          thermistor✓   input✓
          lamp✓   output✓
          LDR✓   input✓
          loudspeaker✓   output✓

                                                          (10 marks)

3   (a)   (i)   temperature sensor✓
          (ii)   display✓
          (iii) amplifier✓
          (iv)   latch✓   (4)

    (b)   (i)   amplifier   or ADC✓
          (ii)   latch✓
          (iii) temperature sensor✓   (3)

    (c)   (i)   amplifier✓
          (ii)   display✓
          (iii) latch✓   (3)

                                                          (10 marks)

4   (a)   top to bottom on diagram   OR✓
                                      AND✓
                                      NAND✓   (3)

    (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
		✓✓	✓✓	✓✓

(2 per col, -1 per error)
                                                                     (6)

    (c)   middle tank✓   (1)

                                                          (10 marks)

5   (a)   (i)   light emitting diode / LED✓
                     gives off light ✓
             (ii)   diode✓
                     allows current one way only✓
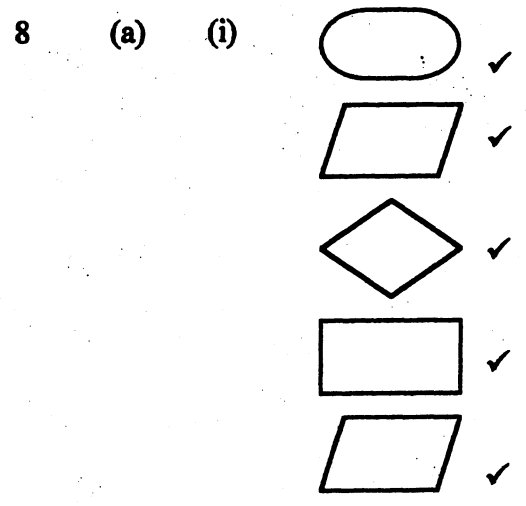   0.7V✓   (5)

       (b)   resistor✓
              5✓   6✓   000Ω✓
              10%✓   (5)

                                                 (10 marks)

6   (a)   amplifier✓   (1)

       (b)   (i)   loudspeakers✓

             (ii)   cassette deck✓

             (iii)   tuner✓   (3)

       (c)   (i)   converts radio waves✓ into electrical signals✓

             (ii)   selects wanted channel✓rejects other channels✓

             (iii)   converts modulated wave✓into audio signal✓   (6)

                                                   (10 marks)

7   (a)   (i)   resistor✓

             (ii)   capacitor✓   (2)

       (b)   (i)   watt✓

             (ii)   hertz✓   (2)

       (c)   (i)   0.06A✓

             (ii)   9 - 6 = 3V✓

             (iii)   3 / 0.06✓   = 50Ω✓

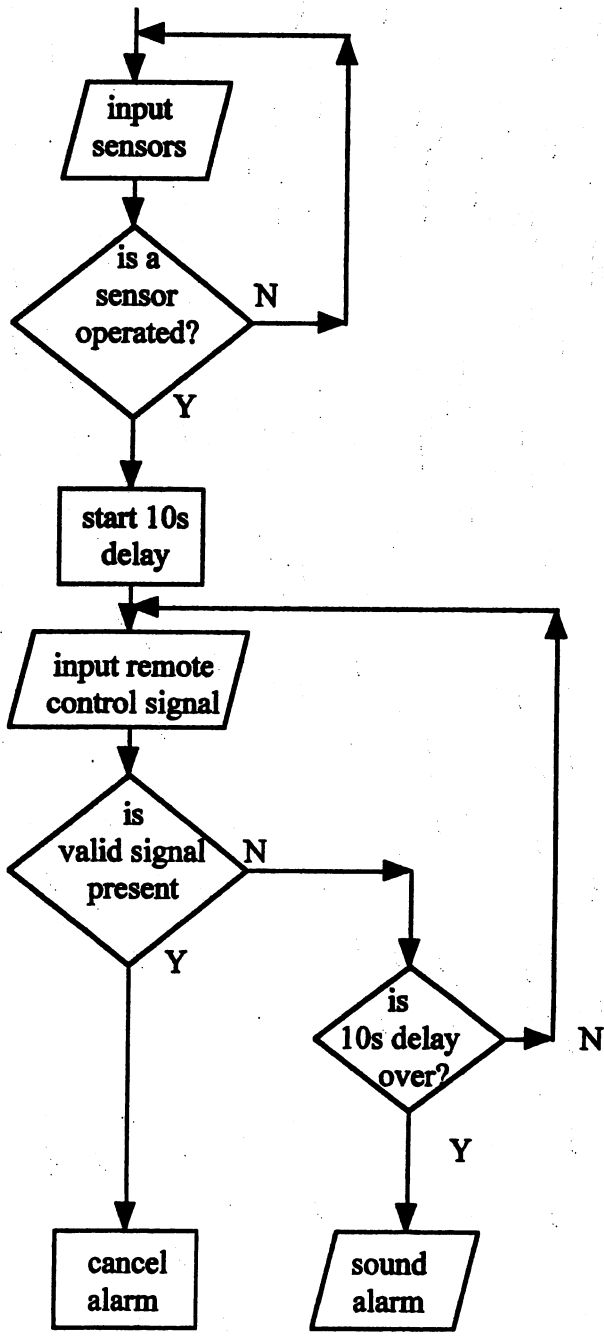   (iv)   3 × 0.06✓   = 0.18W✓   (6)

                                                   (10 marks)

8   (a)   (i)

            (ii)   decision, diamond✓   input, parallelogram✓
                       loop, return to an earlier point✓   output, parallelogram✓
                       process, rectangle✓

                                                (10)

8   (b)   30sec delay starts✓
            no remote control signal present, delay completes✓
            sidelights flash and one bleep ✓
            system loops back to start another delay✓
            repeats above sequence✓
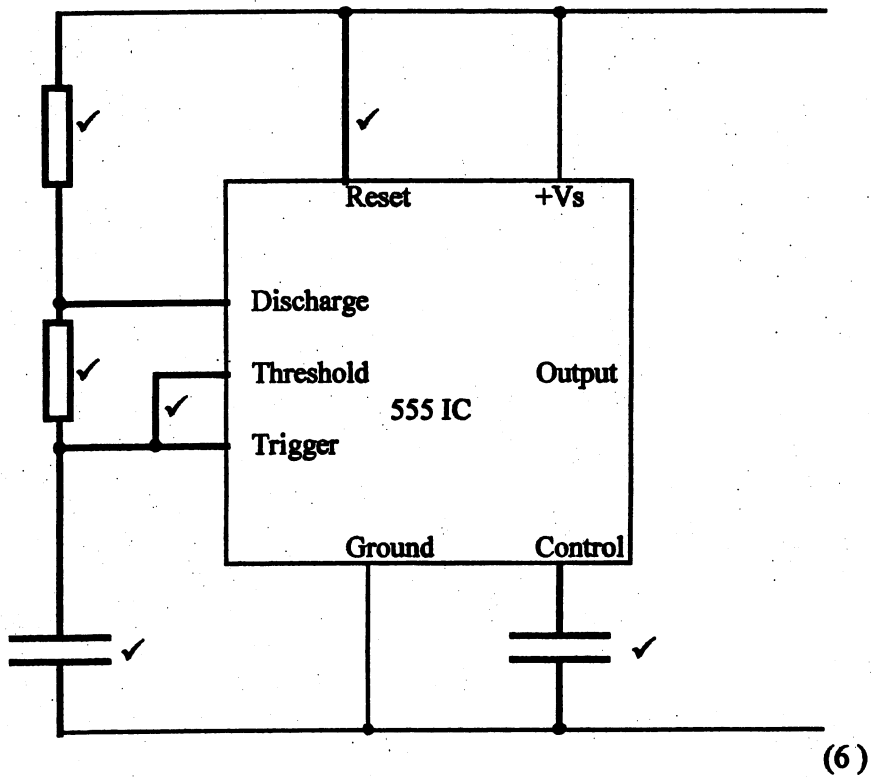   reminder to set alarm✓   (max 5)   (5)
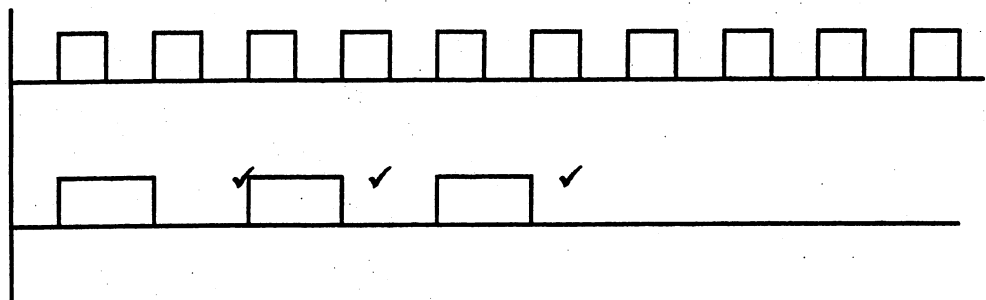
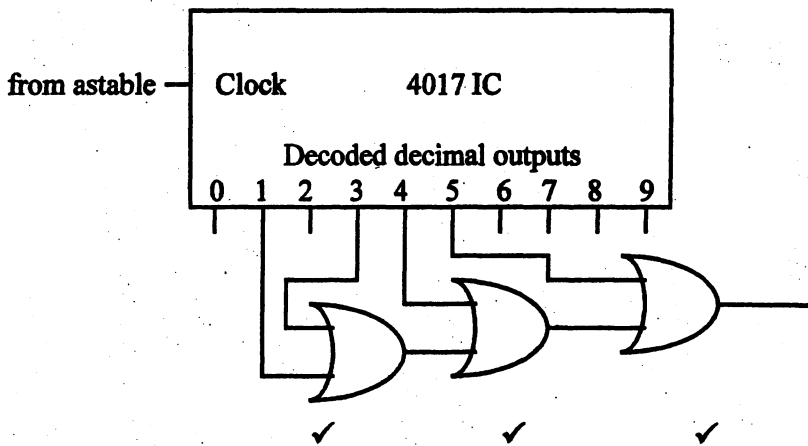   (c)   example answer only

```
                            ┌──────────┐
                            │  input   │◄────────────┐
                            │ sensors  │             │
                            └────┬─────┘             │
                                 │                   │
                                 ▼                   │
                              ╱is a╲                 │
                             ╱sensor ╲──N────────────┘
                             ╲operated?╱
                                ╲  ╱
                                 │Y
                                 ▼
                            ┌──────────┐
                            │ start 10s│
                            │  delay   │
                            └────┬─────┘
                                 ▼
                       ┌───────────────────┐◄──────────────┐
                       │ input remote      │               │
                       │ control signal    │               │
                       └────────┬──────────┘               │
                                ▼                           │
                             ╱  is  ╲                       │
                            ╱valid signal╲──N──►            │
                            ╲ present   ╱       │           │
                              ╲      ╱          ▼           │
                                │Y          ╱ is ╲          │
                                │          ╱10s delay╲──N──►┘
                                │          ╲ over? ╱
                                │            ╲   ╱
                                │             │Y
                                ▼             ▼
                          ┌──────────┐   ┌──────────┐
                          │ cancel   │   │  sound   │
                          │ alarm    │   │  alarm   │
                          └──────────┘   └──────────┘
```

                                         (max 5)

                                              (5)

                                                 (20 marks)

9 **(a)**

Reset   +Vs

Discharge

Threshold   Output

555 IC

Trigger

Ground   Control

(6)

(b) **(i)** only one of the decoded outputs is high at any one time✓
the others are all low✓
in sequence✓

(ii)

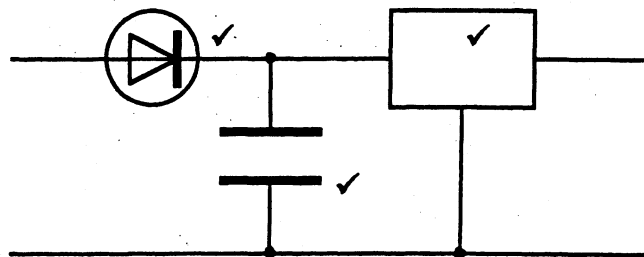
(iii) Three short buzzes✓
a long gap✓
repetitively✓

(iv)

from astable —
| Clock | 4017 IC |

Decoded decimal outputs

0 1 2 3 4 5 6 7 8 9

✓   ✓   ✓

(12)

(c)   **(i)**

sound pattern 1

sound pattern 2   ✓

front door switch   ✓

rear door switch   ✓

✓   buzzer

(ii)   4017 may be on a silent part of sequence when switch pressed✓
push switch to activate a monostable before AND gate✓

(6)

(d)   diode or bridge rectifier symbol,✓
capacitor symbol,✓
3 terminal regulator symbol,✓

✓   ✓

✓

(6)

(30 marks)

(Paper total 120 marks)