



GCSE MARKING SCHEME

SUMMER 2016

**ELECTRONICS E2
4162/01**

INTRODUCTION

This marking scheme was used by WJEC for the 2016 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.

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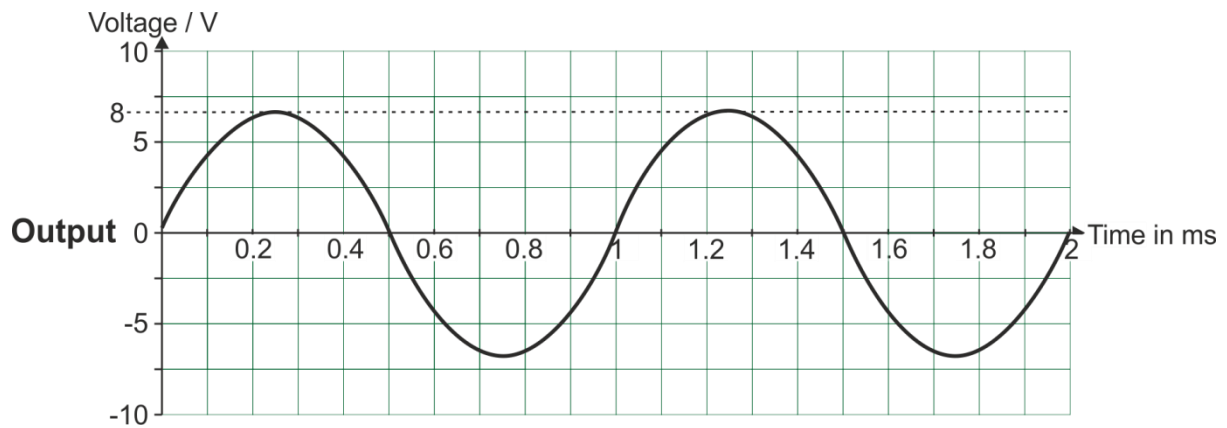
1. (a) Mono – ‘C’ (1)
 Astable – ‘A’ (1)
- (b) (i) D (1)
 (ii) C (1) [4]
2. (a) A (1)
- (b) (i) C (1)
 (ii) 3 (1) [3]
3. (a) B (1)
- (b) C (1) [2]
4. (a) B (1)
- (b) Q output goes to logic 1 on 1st rising edge, exclusively (1)
 Q output goes to logic 0 on 4th rising edge, exclusively (1)
 These two marks are hierarchical.
 \bar{Q} opposite to Q (1) [4]
5. (a) B (1)
- (b) D (1)
- (c) 1 / 1 / 1 / 1 / 0 / 0 / 1 All correct (1) [3]
6. Comparator to middle box (1)
 Schmitt to top box (1) [2]
7. (a) B (1)
- (b) C (1)
- (c) A (1) [3]
8. (a) Microphone (1)
- (b) Power amplifier (1)
- (c) Mixer (1) [3]

9. (a) 40 (1)
 (b) 20 (1) [2]
10. (a) 15 (1)
 (b) A (1)
 (c) 40 mV (1) [3]
11. (a) 2.0 or 2 (1)
 (b) 8 (1)
 (c) C (1) [3]
12. 3 transitions only, on falling edges (1) for Output A graph
 Signal A correct (1) for Output A graph
 Signal B correct (1) for Output B graph [3]
13. (a) Edge at X AND edge at Y AND no others (1)
 Correct logic (1)
- (b) (i) Clock input (1)
 (ii) Reset input (1)
 (iii) 12 V power rail (1) [5]
14. (a) C (1)
 (b) $C = 0$ AND $B = 1$ AND $A = 1$
 All correct (1)
 (c) 'Red' = Off/On/On (1)
 'Yellow' = On/On/On (1)
 'Green' = Off/Off/On (1) [5]
15. (a) 3 (1)
 (b) C (1) [2]
16. (a) Clipping or equivalent (1)
 (b) A (1) [2]

17. Amplitude = 8 V (1)

Period = 1 ms (1)

[2]



18. (a) Each bounce would increase the count, falsely (1)

(b) (i) 3.0 or 3 (1)
(ii) 1.5 (1)

[2]

19. (a) (i) 0.5' (1) and 0.7(1) (2)
(ii) 'Off' AND 'On' (1)

(b) Base current = 2.0 mA(1)

(c) Voltage drop = 7.0 V (1)

(d) Answer to (c) / answer to (b) (1)

[6]