OCR
Oxford Cambridge and RSA

GCE

Electronics

Advanced GCE **A2 H465**

Advanced Subsidiary GCE **AS H065**

OCR Report to Centres June 2015

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

CONTENTS

Advanced GCE Electronics (H465)

Advanced Subsidiary GCE Electronics (H065)

OCR REPORT TO CENTRES

F611 Simple Systems

Candidates generally showed good familiarity with the whole specification with very few candidates failing to provide an answer to a question or giving complete guesses. There was no evidence of candidates running out of time in the exam.

There remains a significant number of candidates who do not correctly calculate voltages in problems with LEDs and resistors. Written explanations continue to be more challenging than calculations for candidates on these papers; marks are lost in explanations through misconceptions or lack of detail.

1 The first question was a gentle introduction to the paper with a question about logic.

Most candidates could do part (a); the most common mistake was in the second term where some candidates wrote $A \cdot \overline{B \cdot C}$ rather than $A \cdot \overline{B} \cdot \overline{C}$ showing a lack of understanding about the conventions for NOT in Boolean expressions.

Most candidates got the correct expression in (b), some candidates successfully simplified the expression to reduce the complexity of the diagram. Some of the diagrams were very scruffy, if the candidates answer is unclear marks will not be awarded. A significant number of candidates gave solutions using only two input gates which gave the correct answer but increased the complexity of the solution. The most common mistakes were to omit the OR gate and just join outputs of AND gates together.

2 Candidates had no problems with naming the NOR gate and all but a few candidates could construct the truth table correctly, a small minority got column C wrong. Candidates mostly gave a correct Boolean expression as either $\overline{A} \cdot \overline{B}$ or $\overline{A + B}$, a few wrongly gave $\overline{A \cdot B}$ or $\overline{A} + \overline{B}$, indicating a similar misconception as those making a mistake in question 1.

The majority of candidates could draw working switch arrangements with a variety of correct answers in, a few put switches or resistors in line with the inputs. Candidates knew what to do in part (e) if they could answer (d) correctly.

A minority of candidates could explain the purpose of the resistors with a switch in a logic circuit, however these candidates showed clarity and good understanding. There were many answers about limiting current to prevent damage to the gate/switches. There were some vague mentions of pull up and pull down which did not show understanding.

Candidates generally drew the correct NAND gate equivalent for a NOR gate, the most common error was to omit the final NAND gate.

3 Many candidates could not get the correct voltage for use in calculating the current in part (a) incorrectly using either 5 V/470 Ω or 1.8 V/470 Ω.

Most candidates could calculate the values for the monostable, very occasionally candidates used a value of R that was too small.

The most common mistake in the explanation was to say that the LED switched on for 20 s rather than turned off.

There were a complete range of answers for the graphs of voltage against time with some candidates obtaining full marks, some very few and everything in between. The most common errors were with the answer to Z and in getting X correct at 40 s.

4 Most of the question was answered well by the majority of candidates. A few candidates got into difficulty with (a) when unsuccessfully rearranging some formula for the voltage from a potential divider, there were fewer problems when candidates used a two stage calculation. Part (c) was more challenging with many answers lacking detail including what happens to the lamp, few candidates could correctly state the voltages at Z.

5 Boolean algebra continues to discriminate well between candidates with strong candidates achieving most of the marks and weaker candidates struggling to get many marks. The most challenging problems seem to have been (b) and (e).

6 Most candidates showed understanding of the use of a comparator in this context. In part (b) some of the graphs were not steep enough at the transitions. Part (c) proved a little more challenging, as explanations often do in these papers; many lacked detail and some showed confusion. The properties of the thermistor were well described but some of the symbols were poor and the arrangement was sometimes inverted in (d) (ii). Parts (d) (iii) and (e) proved to be more challenging calculations with a significant minority of candidates failing to obtain marks here; in part (e) many candidates failed to obtain the correct voltage across the resistor.

7 Many candidates could explain why the driver was needed in the circuit but a significant minority only obtained one mark as they only mentioned one of the marking points rather than referring to both of the blocks connected to the driver. Most candidates could calculate the frequency in (c) (i) but about a third incorrect used 0.2 s as the period. Candidates showed familiarity with the relaxation oscillator circuit, fewer than half obtained full marks but the overwhelming majority gained most of the marks.

8 This question was generally less challenging than some of the preceding questions. The most challenging aspect of this question seems to have been the XOR gate with an inverted input.

F612 Signal Processors

General Comments:

Candidates experienced some difficulties with this paper mainly due to a lack of ability to write simple flowcharts. It is not a skill which can be acquired quickly and candidates who struggle at this stage are unlikely to make swift progress with the microprocessor content of A2.

Comments on Individual Questions:

Question No.

1 This question about NOR-gate bistables was well answered by most candidates. Although the majority of candidates could explain the meaning of set and reset for part (a)(i), many were unable to satisfactorily provide a definition of active-high. Part (a)(ii) discriminated well, as only able candidates knew that the output remained unchanged when both inputs were low. As expected, the vast majority of candidates knew the truth table for a NOR gate and many were able to explain how to make the bistable store a 1.

2 This question was about a latch made from NAND gates. Unfortunately, the diagram was in error, with the L and D labels swapped round. This meant that when drawing the final line of the timing diagram, candidates had two ways of working it out; either use the summary of the latch's behaviour, given in the question stem, or work it out from the circuit diagram. Both routes could earn full marks for candidates. The first two lines of the timing diagram proved to be quite straightforward, even for weak candidates, but the third line proved to be more demanding, with only a minority of candidates getting it completely correct.

3 This question about inverting amplifiers proved to be very straightforward for bright candidates. For the waveform of part (a)(i), weak candidates often drew ones with the wrong amplitude, but most had the correct frequency, shape and phase. For part (a)(ii), weak candidates often forgot to make the input resistor 30 kΩ as required, and only the very weakest were unable to draw the circuit correctly - a missing label on the 0 V line was the commonest error. For part (b), although the vast majority of candidates knew that the amplifier altered the amplitude of the signal, too many assumed that frequency and period were separate properties of the signal which were not altered. The majority of candidates earned full marks for their sketch of the transfer characteristic in part (c), with weak candidates often forgetting about saturation.

4 This question proved, as expected, to be much more challenging for all of the candidates than the preceding one, with only a small minority of them gaining the majority of the marks. For part (a)(i), weak candidates often used the wrong pull-down resistor value in the formula for the gain of the non-inverting amplifier. Few candidates were able to use the op-amp transfer characteristics to explain why negative feedback kept the op-amp inputs at the same voltage. This was disappointing and suggests that centres teach candidates how to use amplifiers with negative feedback without teaching them how they work. Part (b) involved the hard concept of impedance matching, so it was not surprising to find that only a minority of candidates could explain the effect of altering the input impedance of the amplifier, and even fewer could successfully calculate the effect on the output signal of a change in the input impedance.

5 The question allowed candidates to return to digital electronics, traditionally their strong point. Nevertheless, even the more able candidates failed to earn full marks. In part (a)(i), many weak candidates failed to connect the S and R terminals low. Part (a)(ii) discriminated well; although candidates could earn half marks for the output changing on a falling edge; more candidates earned no marks as opposed to full marks. Part (b)(i) was well answered, although many candidates failed to mention that the system would reset on every fifth pulse. Few weak candidates earned any marks for part (b)(ii); able candidates earned full marks. Too many candidates failed to realise that the counter reset as soon as the fifth pulse arrived, losing marks accordingly. Very few candidates earned the mark for part (b)(ii); most appearing to ignore the reset-on-5 for the counter.

6 This question was about a system which generated a continuous sequence. Although most candidates were able to correctly calculate the period of the oscillator in part (a), many seemed to work backwards from the answer, arbitrarily multiplying the period by 8 rather than explaining that the counter had 2^3 states per cycle. Part (b) required candidates to complete a timing diagram for the system; many candidates scored full marks. The Boolean algebra statement of part (c)(i) proved to be very straightforward for nearly all candidates, but the simplification required for part (c)(ii) was generally poorly done, with most candidates earning no marks at all, often because they failed to either show how one step followed another, or include enough steps to make the working comprehensible. It was pleasing to see that strong candidates had no difficulty in making the steps clear, so that they earned the marks. For part (c)(iii), candidates appeared to earn all the marks or none, with too many weak candidates unable to draw a correct circuit diagram.

7 The microcontroller question usually proves to be harder than most of the others, and this one was true to form. Although part (a)(i) was well answered by almost all candidates, part (a)(ii) was not; many candidates completely ignored the MOSFET driver and the buzzer and failed to give enough detail about the display to earn full marks. The flowchart of part (b) discriminated well, with strong candidates providing lots of fine detail in their explanations and weak candidates just describing the flowchart without any reference to its effect on the whole microcontroller system. Unexpectedly, most candidates struggled to earn even one of the marks for part (c), suggesting that centres do not give them enough practice in writing flowcharts.

8 Although the majority of candidates could describe the effect of the filter's transfer characteristic of part (a), only a minority could provide a satisfactory reason for including it in an audio system. Part (b) discriminated well; the few weak candidates who were able to draw the correct circuit usually ignored the gain information in the transfer characteristic, but strong candidates were able to earn all the marks.

F613 Build and Investigate Electronic Circuits

General Comments:

Again this year, the quality of the vast majority of the reports submitted for this module was very high. In addition, the presentation of the reports and associated documentation was, on the whole, neat and well-prepared. One or two centres had submitted work which was a little disorganised with pages not numbered and also in the wrong place. This can be very time consuming for the moderator to organise and correct. The marking of the scripts with comments added is very useful and can aid the moderator diagnose problems with the application of the criteria. Also, not every centre sent the form MS1 to the moderator.

The majority of centres were within tolerance and showed good application of the marking criteria. For those centres whose marks fell outside the current tolerance, the problems remain the same as those already highlighted in previous years. Some centres fell just inside the tolerance but were very close to the limits which would have meant a change to the raw mark. It is important to be clear about every criterion point and only award the mark if there is evidence within the report to justify the mark. Since all three pieces of work submitted for F613 are essentially the same, an error of judgement with a particular criterion is compounded and exceeding the tolerance becomes a likely outcome. The following is to remind centres of the criteria which continue to cause trouble.

Criterion No.

1a For this criterion, moderators look for a good description of the circuit a relevant use of the circuit, and some testable predictions. It is in this section that candidates must score the maximum mark of 4/4 if full marks can be awarded in two other sections (1b and 3c). This does not mean that every candidate should be awarded 4/4 in this section.

1b This remains the criterion which gives the most problems. Some candidates are unclear about the nature of a test plan. Many just describe how the testing was done; this would score 0/3. A test plan can be considered to be a 'wish list' for testing a subsystem, in other words, it is a plan (i.e. done before actual testing) of how to fully test a given subsystem and will indicate what instruments are to be used, how they are to be used, and what signals are to be inputted into the subsystem (if appropriate). It is a good idea to start this section with……'In order to test this subsystem, I am going to ………. '

It is clear that even at A2 level, some candidates still struggle with this. Getting it right at this level will help candidates in the future.

2a In order to score highly for the circuit build quality, components should be flat against the board, the wiring neat and straight, and some recognisable colour code used.

3b Presentation of the results of the test must be in table or graph form to score the higher mark. A series of photographs showing test results would not qualify for high marks in this section. Also, for a digital circuit, the actual voltage levels should be shown, rather than 'logic 0' or 'logic 1'.

4a Moderators look for a correct circuit diagram with all component values shown. In addition to this, they also look for other diagrams which enhance the written communication. Testing diagrams without equipment shown do not justify a mark.

The criteria above represent the ones which usually cause problems with the raw marking. If any centre is still unclear about the criteria, or would like further support, then they should contact OCR.

F614 Electronic Control Systems

General Comments:

Most candidates did well across all the questions in this paper, showing few gaps in topics across the specification, indicating that candidates are generally well prepared and have covered the whole specification in depth. This report will highlight the areas were candidates did not do so well in order to aid teachers and candidates prepare for future exams.

Comments on Individual Questions:

Question 1 proved generally straightforward for the majority of candidates, showing good familiarity with MOSFET amplifiers. The most challenging part of the question was (d)(i) with many candidates failing to provide a clear explanation covering both of the marking points. Some candidates wrongly suggested that this was to limit the power to a safe value for the MOSFET.

Question 2 tested candidates' knowledge and understanding of microcontrollers. Candidates showed good recall of diagrams in parts (a) and (c) but found descriptions and explanations more challenging. In part (b) many descriptions lacked clarity with the minority of candidates clearly stating that all data transfer was between the CPU and some other part of the system. A significant number of candidates incorrectly stated that the data bus transferred data directly from the input port to the output port. A large number of candidates wrongly suggested that the data bus was some kind of store or register. In part (e) most candidates correctly stated the location of the PC but the explanation and description of its function was very challenging for the majority of candidates, with some confusing the PC and IR and many stating that the PC pointed at the current rather than the next instruction.

Question 3 was about memory and showed that the majority of candidates could describe how the module operated. The calculations in parts (b) and (c) were challenging for most candidates with a number of different incorrect answers for part (b) and many candidates not knowing what to do about the two's complement in part (c) with common incorrect answers of 64, 63 and 32 as well as some negative answers. Part (e) was generally well answered with just a few candidates getting confused about active low inputs on the control pins.

Question 4 was about power supplies and proved to be one of the more challenging questions on the paper. Many candidates lost marks on the voltage against time graphs in parts (b) and (c). In part (b) amplitude was not always correct and a number of candidates failed to show 0 V output when the input was between -1.4 V and +1.4 V. Part (c) proved particularly challenging with the shape of the wave and the maximum and minimum values proving the most discriminating marking points. There were some very good answers for part (d) showing real understanding and familiarity with this topic, but some candidates seemed to think that the opto-isolator rendered the switch mode power supply safer than a linear supply. In part (e), most candidates could get some marks showing familiarity with the block diagram but there was a lack of clarity about the oscillator and the opto-isolator; many candidates stated that the frequency of the oscillator changed with load and many wrote about some safety feature of the opto-isolator but were vague about its role in the maintenance of a fixed voltage at the output.

Question 5 was about proportional feedback and showed a good spread of marks discriminating well between strong and weak candidates. Most candidates understood that the circuit would hunt but not all explained why this would be a problem in this context. Candidates could complete the difference amplifier in part (b) but many had problems with the amplifier in part (c) with many showing positive feedback and many drawing inverting amplifiers. Part (d) was a particularly good discriminator with about a sixth of candidates obtaining full marks; a similar proportion not achieving any marks and then a good spread of candidates getting some of the marks. The most common errors were not showing slowing as the camera approached the desired position, getting the polarity of E wrong and not showing saturation in E and D.

Question 6 was about programming microcontrollers and continues to show that most candidates are well prepared for this topic and have extensive practical experience of programming microcontrollers. Parts (a) and (b) showed few errors. In part (c), many candidates found the toggling challenging to describe and there were many errors about how many times the sequence repeated, including some candidates failing to recall that the numbers were in hexadecimal. The construction of a long delay using nested loops in part (d) was generally completed well by the stronger candidates with over a third obtaining full marks. The most common errors were not getting the two loops to call the wait1ms the correct number of times, ensuring that the labels and the conditional jumps were in the correct places. There was a significant number of candidates who did not use the RCALL instruction when invoking the wait1ms subroutine incorrectly, writing “wait1ms” instead of “RCALL wait1ms”.

Question 7 was a relatively straightforward question on the MOSFET. Some candidates read the gradient for the resistance rather than the inverse of the gradient. There were many inaccurate answers due to poor readings from the axes, where candidates had not used 6 mA/2 V. A significant number of candidates failed to calculate the voltage across the MOSFET in part (c), using 3.4 V instead of 1.6 V. Part (d) discriminated reasonably well; most candidates drew the correct shape for the curve below the existing curve, but not all showed the transition happening at a lower voltage than the existing curve. Most could explain that the LED was dimmed.

F615 Communication Systems

General Comments:

Candidates generally made the same errors as in previous years. Many of the questions require candidates to explain the operation of circuits and systems, and weak candidates often let themselves down by using vague terms like “signal” instead of more exact ones like “voltage”, “frequency” or “current”.

Comments on Individual Questions:

Question No.

1 The first question of this paper is always about video displays. For part (a)(i), too many weak candidates wrote everything they knew about the functions of all three cables, instead of just the video cable. Even more able candidates failed to read the question carefully enough, often confining their explanation to a single pixel instead of the whole image. Part (a)(ii), about the function of the line sync cable, was well answered by many candidates. The calculation of part (a)(iii) was well answered by strong candidates; many weak candidates incorrectly assumed that the pixel rate was the same as the bandwidth. Most candidates had little trouble calculating the frame refresh rate for part (a)(iv), but only a minority compared it with the flicker threshold of 25 Hz. For part (b), although most candidates knew that red, green and blue signals were required for a colour display, only a minority answered the question and clearly stated that two more video cables would be required, with each carrying a separate signal for one of the three basic colours.

2 This question was about amplitude modulation. It was interesting to find that many candidates, regardless of ability, misread the question of part (a) and sketched an amplitude modulated waveform instead of the modulating waveform. Those candidates who did sketch the correct waveform, did so correctly. Nearly all candidates gained full marks for part (b). For part (c)(i), too many candidates used the carrier frequency instead of the modulating frequency in their calculation of the capacitor in the filter. For part (c)(ii), almost no candidates earned all of the marks, mostly because they did not provide enough detail for their description of the transfer characteristics of a diode. It was noticed that weak candidates often used “voltage” instead of “current” in their account of diode behaviour.

3 This question about frequency modulation discriminated well. Even strong candidates struggled to provide enough detail in their description of the modulator's transfer characteristic, seldom using the frequency range provided in the question and often failing to mention the constant amplitude of the output waveform. Weak candidates often lost marks by referring to “signal” or “amplitude” instead of “input voltage” as the factor which decides the frequency of the output. Candidates fared better with part (b), although too many candidates incorrectly assumed the bandwidth for amplitude modulation. Part (c) was well answered by most candidates; although nearly all of them knew that Schmitt triggers reduced the noise, many failed to explain how. Part (d) about the operation of a demodulator proved to be more demanding. Weak candidates lost marks by failing to link the average voltage of the monostable output to the frequency of its triggering pulses.

4 This question presented candidates with a circuit diagram of the triangle-wave generator in a PWM system. Part (a) required candidates to show values for the amplitude and frequency of the triangle wave. Weak candidates could not do this. Although strong candidates could all show how to calculate the amplitude, many of them were unable to calculate the frequency, usually because they did not realise that the effective voltage change per cycle was four times the amplitude - they assumed twice the amplitude. Part

(b)(i) proved to be equally discriminating, with only strong candidates earning both marks for their addition of a comparator to the triangle-wave generator; less able candidates did not seem to know where to apply the input signal. Many candidates earned no marks at all for part (b)(ii), having described the transfer characteristic of the comparator instead of relating the mark-space ratio of its output to the voltage at its input. As with previous questions on analogue systems, weak candidates lost marks by confusing “voltage” with “signal” or “amplitude”. Better candidates had no difficulty in gaining full marks for part (c)(i), but weak candidates often struggled to correctly label the log axes correctly. Part (c)(ii) was one of the stretch-and-challenge questions, and most candidates earned no marks at all for it.

5 This question tested candidates' understanding of twisted-pair cable systems. Most candidates were able to suggest another way of reducing interference for part (a), but many omitted to explain how they worked. Similarly, only strong candidates were able to fully explain why the cables were twisted together for part (b); many weak candidates assumed that the reduced capacitance somehow reduced the effect of outside signals. Part (c) required candidates to explain how the whole system worked and discriminated well. Candidates who used the signal labels provided in the circuit diagram tended to score more highly than candidates who did not.

6 For part (a), many weak candidates confused FDM with TDM, and too many candidates lost a mark by failing to make it clear that each station could only use the set of frequencies that had been allocated to it. Most candidates earned at least half of the marks for part (b)(i), but only strong candidates remembered that the bandwidth of a channel had to be twice the maximum signal frequency. Although for part (b)(ii), many candidates knew that FM had a greater bandwidth than AM, many less able candidates lost a mark by stating that this would cause interference between channels rather than resulting in fewer channels. The final part of this question was well answered by most candidates, although only a minority provided enough detail to earn all of the marks.

7 The first part of this question required candidates to design the front end of a superhet radio receiver. Weaker candidates often lost marks by using unorthodox aerial symbols, omitting to label the output and ignoring the earthing. Part (b)(i) discriminated well, with weak candidates often using one of the edge frequencies of the filter instead of its centre frequency to calculate the frequency of the oscillator. Part (b)(ii) about the operation of the whole superhet receiver was another stretch-and-challenge question, so it was not surprising that only a minority of candidates were able to earn full marks. In particular, many candidates were vague about the operation of the mixer, using terms like “mix”, “combine” and “add” instead of “modulate”. The last two parts of the question asked candidates to explain the parts of the system responsible for its selectivity and sensitivity. Apart from a minority of candidates who confused the two terms, many ignored the filter and plumped for the tuned circuit instead of the filter as the deciding component for setting the selectivity.

8 Candidates responded well to this final question about a digital transmission system. Most of them scored all marks of part (a) for their descriptions of serial-to-parallel and digital-to-analogue conversion. Only weak candidates struggled with the calculation of part (b)(i), many confusing the number of states of a binary word with the number of bits. Similarly, in part (b)(ii), weak candidates often forgot that at least two samples were needed in each cycle of the signal, so assumed that the sample frequency was the same as the signal frequency. Part (c)(i) asked candidates to explain the operation of a parallel-to-serial circuit. It was pleasing to see that many candidates were able to earn the majority of the marks, although only a minority were able to describe the role of the shift register in accepting the input parallel binary word at the start, and presenting it at the output one bit at a time. Only a small minority of candidates remembered the need for stop and start bits in asynchronous digital transmission system for part (c)(ii).

F616 Design Build and Investigate Electronic Circuits

The number of centres submitting work to the OCR Repository still remains low. Whilst paper versions are still acceptable, the marking of scripts using a digital technique does have advantages. Submission of work for moderation is very easy and quick to do; there are no costs incurred in the submission of work and the carbon footprint is reduced; the marked work by centres is easily saved. Of course, it is also possible to mark scripts on paper then, when the request for samples comes through, the requested samples can be converted to pdf and uploaded to the Repository. This will at least save posting costs.

In terms of the preparation of the work submitted for moderation, the vast majority was well-prepared with all the associated documentation in order. A small number of centres forgot to include the form MS1 which must accompany the moderation samples. The number of clerical errors reported by the moderators was a lot fewer than last year.

The range of projects attempted was again impressive with a number of candidates attempting some very challenging circuits. Many of these candidates produced circuits requiring a large number of subsystems; more than the five required to be eligible for the maximum mark of 60/60. A common feature, as mentioned last year, but it still continues, is the lack of final testing of the full circuit and comparing the results of the final circuit testing with the initial full circuit specification. In fact, to produce a good specification (criterion 1b) is still an area which many candidates find difficult to achieve. It should also be remembered that each subsystem must be specified as well.

In general, the raw marking of the work for this module was still found to be slightly too generous for a number of centres. The problem areas do not change from year to year and the points raised below address the typical problems encountered by moderators.

To achieve high marks for Research (criterion 1a) candidates should offer some useful and relevant numeric or circuit information. For example, if a candidate attempts a motor speed controller circuit, using a closed loop system, and presents research solely based on the benefits of using closed loop systems, the mark for this criterion is not likely to be high. Examples of good research include particular circuit diagrams needed to build a subsystem, how a circuit works, the value of the break frequency of a filter, etc. The report must contain statements about how the research has helped the design or production of the circuit.

The specification (criterion 1b) should contain some numeric information for each subsystem and the final circuit. This enables analysis to be carried out on test results for each subsystem and the final circuit. A poor specification is likely to result in a low mark for criteria 1b, 3c and 3d. Thus, if high marks are to be achieved, it is important to present detailed final circuit and subsystem specifications.

The test plans (criterion 1c) are often not given the high profile they deserve. The plans are often poorly done and do not contain the detail needed to score the higher marks. When writing test plans, candidates should adopt the future tense, for example, ‘to test this subsystem, I am going to……’

For fault finding (criterion 2e), in order to score high marks, candidates must present the faults and discuss how these were resolved. It was found on several occasions that a report contained no reference to fault finding yet marks had been awarded for criterion 2e. The faults should be detailed clearly and the steps to finding the solution given.

Analysis of results (criterion 3c) is a higher level skill which candidates can find difficult. If a subsystem or the final circuit has been specified well, then the task facing the candidate is to discuss, quoting evidence, whether the subsystem or final circuit performs as predicted. For example, if a voltage amplifier subsystem is attempted, and the gain is quoted as ten, then the results taken should be analysed to show the actual gain obtained. A brief statement of the kind, ‘as you can see, the subsystem works’, is not analysis and does not score a mark.

For circuit diagrams (criterion 4a) all component values must be shown on the diagram and must be correct to score full marks.

Finally, for the acknowledgement of sources of assistance (criterion 4d), the acknowledgement should include a detailed reference to the source and what assistance was obtained.

If centres would like further training or support then they should contact OCR.

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

OCR Customer Contact Centre

Education and Learning
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored