

Electronics task form

GCE A Level Electronics

Component 3 - Extended system design and realisation tasks

Centre Number:	Centre Name:
Candidate number:	Candidate name:

Task 1 Focus	Teacher's signature:
	Date:
Task 2 Focus	Teacher's signature:
	Date:

Notice to candidate

The work you submit for assessment must be your own.

If you copy from someone else, allow another candidate to copy from you, or if you cheat in any other way, you may be disqualified from at least the subject concerned.

Candidate declaration

I have read and understood the Notice to candidate (above). I have produced the attached work without assistance other than that which my teacher has explained is acceptable within the specification.

Candidate's signature:	Date:
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Teacher declaration

I confirm that:

- any assistance that goes beyond general guidance has been recorded and taken into account when marking the work;
- otherwise apart from general guidance given within the parameters set out in the specification, the work was solely that of the candidate;
- the work was conducted under the conditions laid out by the specification.

Teacher's signature:	Date:
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Details of additional assistance given

Record here details of any assistance given which goes beyond general guidance and taken into account when the work is marked. (continue on separate sheet if necessary). You must indicate where you have taken into account the additional assistance provided via annotations.

Task 1: Microcontroller system (Assembler language program)

1. System planning		Mark awarded
3 marks	The candidate has provided: <ul style="list-style-type: none"> a clear analysis of a problem and a design specification in both qualitative and quantitative terms (typically at least 3 of each), and including 2 or more detailed realistic measurable parameters with tolerances where applicable 	
2 marks	The candidate has provided: <ul style="list-style-type: none"> an analysis of a problem and a design specification in both qualitative and quantitative terms (typically at least 2 of each), and including 1 or more realistic measurable parameters 	
1 mark	The candidate has provided: <ul style="list-style-type: none"> an analysis of a problem and a partial design specification in either qualitative or quantitative terms (typically at least 4 in total) 	
0 marks	Response not creditworthy or not attempted.	
2. System Development		Mark awarded
6 - 8 marks	The candidate has: <ul style="list-style-type: none"> produced a clearly annotated, logical flowchart to show the structure of the program and make predictions regarding its behaviour devised an assembly language program that reacted to and used information from inputs to control outputs and utilised 5 or more port bits used 10 or more different commands in the program including both conditional and unconditional branching commands given a full account of assembling the program, fully recording the results of the testing for and removal of syntax error 	
3 - 5 marks	The candidate has: <ul style="list-style-type: none"> produced an annotated flowchart to show the structure of the program devised an assembly language program that reacted to and used information from at least 1 input to control at least 1 output and utilised 4 or more port bits used 7 or more different commands in the program including both conditional and unconditional branching commands given an account of assembling the program, recording the results of the testing for and removal of syntax error 	
1 - 2 marks	The candidate has: <ul style="list-style-type: none"> produced a flowchart to show the structure of the program which was either incompletely annotated or lacked clarity devised an assembly language program that utilised 3 or more port bits; used 4 or more different commands in the program including 1 or more branching commands given a limited account of assembling the program, partially recording the results of the testing for and removal of syntax error 	
0 marks	Response not creditworthy or not attempted.	

3. System Realisation		Mark awarded
5 - 6 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> produced an accurate circuit diagram and physical circuit layout which were very well organised and made wire connections to a very good standard with all wires arranged vertically/horizontally downloaded the program to the microcontroller circuit and comprehensively tested the complete physical system prototype provided a detailed analysis of the results for a system that worked consistently and reliably 	
3 - 4 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> produced an accurate circuit diagram and physical circuit layout which were fairly well organised and made wire connections to an acceptable standard with most wires arranged vertically/horizontally downloaded the program to the microcontroller circuit and tested the complete physical system prototype provided some relevant analysis of the results for a system that mainly worked 	
1 - 2 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> produced a circuit diagram and physical circuit layout which tended to be not very well organised or incomplete downloaded the assembly language program to the microcontroller circuit and partially tested the complete physical system prototype provided some superficial analysis of the results for a system that worked at some time 	
0 marks	Response not creditworthy or not attempted.	
4. Evaluation		Mark awarded
3 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> undertaken a critical and objective evaluation of the performance of the complete system which was valid, made comprehensive comparisons with the design specification and made at least 2 suggestions for improvement with explanations of how they improve the system 	
2 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> undertaken an objective evaluation of the performance of the complete system which was valid, made some comparisons with the design specification and made at least 2 suggestions for improvement 	
1 mark	<p>The candidate has:</p> <ul style="list-style-type: none"> undertaken a simple evaluation of the performance of the complete system which was valid in few respects, made minimal comparison with the design specification and made at least 1 superficial suggestions for improvement 	
0 marks	Response not creditworthy or not attempted.	

Task 1 – Total mark

20

Task 2: Electronic system

1. System planning		Mark awarded
5 - 6 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> • identified a problem to be solved and provided detailed relevant research and analysis of the problem • produced a design specification in both qualitative and quantitative terms (typically at least 4 of each), and including 3 or more detailed realistic electronic parameters with tolerances where applicable 	
3 - 4 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> • identified a problem to be solved and provided some relevant research and analysis of the problem • produced a design specification in both qualitative and quantitative terms (typically at least 3 of each), and including 2 or more realistic electronic parameters 	
1 -2 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> • identified a problem to be solved and provided superficial research and analysis of the problem • produced a limited design specification in both qualitative and quantitative terms (typically at least 5 in total), and including 1 or more realistic electronic parameters 	
0 marks	Response not creditworthy or not attempted.	

2. System Development		Mark awarded
13 - 18 marks	<p>The candidate has developed the system as a series of sub-systems and has:</p> <ul style="list-style-type: none"> • given a complete design specification and devised circuit details for 6 or more sub-systems including both analogue and digital sub-systems • considered alternative sub-system designs for 3 or more different sub-systems, made predictions regarding their behaviour and gave thorough reasons for final sub-system choice • presented accurate, high-quality fully labelled sub-system circuit diagrams • described test procedures and identified all of the test equipment for 6 or more different sub-systems • made and recorded all relevant numerical measurements for 6 or more different sub-systems • analysed the results for 6 or more different sub-systems and made comprehensive comparisons with the sub-system specifications 	
7 - 12 marks	<p>The candidate has developed the system as a series of sub-systems and has:</p> <ul style="list-style-type: none"> • given a design specification that was appropriate in most respects and devised circuit details for 4 or more different sub-systems including both analogue and digital sub-systems • considered alternative sub-system designs for 2 or more different sub-systems systems and given some valid reasons for final sub-system choice • presented accurate, good quality, labelled sub-system circuit diagrams • described test procedures and identified most of the test equipment for 4 or more different sub-systems • made and recorded most numerical measurements for 4 or more different sub-systems • analysed the results for 4 or more different sub-systems and made comparisons with the sub-system specifications in most cases 	
1 - 6 marks	<p>The candidate has developed the system as a series of sub-systems and has:</p> <ul style="list-style-type: none"> • given a design specification that was appropriate in some respects and devised circuit details for 2 or more sub-systems • considered alternative sub-system designs for 1 or more different sub-systems and given some mainly superficial reasons for final sub-system choice • presented sub-system circuit diagrams which were partially labelled or lacked clarity • described test procedures and identified some test equipment for 2 or more different sub-systems • made and recorded some of the measurements for 2 or more different sub-systems • analysed the results for 2 or more different sub-systems and made some comparisons with sub-system specifications 	
0 marks	Response not creditworthy or not attempted	

3. System Realisation		Mark awarded
14 - 20 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> • produced accurate high-quality labelled block and circuit diagrams for the complete system and provided a complete component list • planned and produced a very well organised physical circuit layout with all wires arranged vertically/horizontally and showed a good awareness of risk assessment • arranged wires with no unnecessary crossing of components which were mounted to a high standard and showed a good awareness of safe working procedures • provided comprehensive evidence of planning test procedures for the complete physical system prototype and has identified appropriate equipment • made and clearly recorded all the relevant numerical measurements on the system parameters using standard scientific convention including a detailed analysis of the results • explained clearly how 2 or more sub-systems were interfaced together and explained how an interfacing issue was solved • produced an electronic system that worked consistently and reliably and included a comprehensive user guide 	
7 - 13 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> • produced accurate, good quality labelled block and circuit diagrams for the system and provided a partially completed component list • planned and produced a well organised physical circuit layout with most wires arranged vertically/horizontally and showed some awareness of risk assessment • arranged most wires with no unnecessary crossing of components which were mounted to a good standard and showed some awareness of safe working procedures • provided evidence of planning test procedures for the complete physical system prototype and has identified appropriate equipment in most cases • made and recorded the most relevant numerical measurements on the system parameters using standard scientific convention including some analysis of the results • explained how 2 or more sub-systems were interfaced together • produced an electronic system in which at least 5 different sub-system worked correctly most of the time and included a basic user guide for the system 	
1 - 6 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> • produced block and circuit diagrams for the system which were not completely labelled or lacked clarity • planned and produced a physical circuit layout, with little evidence of organisation or wires being arranged vertically/horizontally and showed superficial awareness of risk assessment/safe working procedures • wire connections made with some wires covering components or components not always mounted securely to the circuit board • provided some evidence of planning test procedures for the complete physical system prototype and has identified some appropriate equipment • made and recorded some relevant numerical measurements on the system parameters, with minimal analysis of the results • produced an electronic system in which at least 3 different sub-systems worked correctly at some time 	
0 marks	Response not creditworthy or not attempted	

4. Evaluation (QER)		Mark awarded
5 - 6 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> provided a coherent, succinct evaluation, using correct terminology of how the system works in terms of the function of each block and the signal transfer between blocks undertaken a critical and objective evaluation of the performance of the complete system which was valid, made comprehensive comparisons with the design specification and made at least 3 thorough suggestions for improvement with explanations of how they improve the system <p><i>There is a sustained line of reasoning which is coherent, substantiated and logically structured. The information included in the response is relevant to the argument.</i></p>	
3 - 4 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> provided an evaluation, using some correct terminology of how the system works in terms of the function of each block, which was quite well structured and made some reference to the signal transfer between blocks undertaken an objective evaluation of the performance of the complete system which was valid, made some comparisons with the design specification and made at least 3 suggestions for improvement <p><i>There is a line of reasoning which is partially coherent, supported by some evidence and with some structure. Mainly relevant information is included in the response but there may be some minor errors or the inclusion of some information not relevant to the argument.</i></p>	
1 - 2 marks	<p>The candidate has:</p> <ul style="list-style-type: none"> provided an evaluation of how the system works in terms of the function of each block, in which some of the content may be ambiguous or disorganised undertaken a simple evaluation of the performance of the complete system which was valid in few respects, made minimal comparisons with the design specification and made at least 2 superficial suggestions for improvement <p><i>There is a basic line of reasoning which is not coherent, supported by limited evidence and with very little structure. There may be significant errors or the inclusion of information not relevant to the argument.</i></p>	
0 marks	Response not creditworthy or not attempted	

Task 2 – Total mark

50