Task 1: Microcontroller system (Assembler language program)

1. System planning		Mark awarded
3 marks	**The candidate has provided**: • 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**: • 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:** • 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:** • 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:** • 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:** • 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	**The candidate has:** • 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	**The candidate has:** • 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	**The candidate has:** • 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	**The candidate has:** • 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	**The candidate has:** • 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	**The candidate has:** • 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