

Examiners' Report/ Principal Examiner Feedback

Summer 2016

Pearson Edexcel GCSE in
Engineering/Manufacturing (5EM03)
Paper 3E: Electrical and Electronics,
Process Control, Computers,
Telecommunications

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General Comments:

Only 27 students took this paper so difficult to come to clear conclusions. Overall, this paper produced a good range of responses to the questions. The majority of learners attempted all questions but this year some empty spaces were again noticeable as the questions ramped up in Section B.

Lower ability learners gave more generic responses to questions, such as 'quick/fast/cheap' which gained limited marks. The more demanding questions, especially at the end of Section B, were difficult for many learners, and consequently a proportion gave poor responses. The question relating to the Impact of Robotics was well answered by those who were taught about this.

Most learners have demonstrated being taught examination skills and techniques. Some of the low ability learners still had problems understanding the questions in Section B.

It was noticeable that a number of learners had little knowledge of the full range of electronic equipment, components and their function in circuits.

Section A

- Q1 The majority of learners correctly identified the products belonging to the Electrical and Electronics sector in Part (a) and the Process Control and Computer sector in Part (b).
- Q2 The majority of learners failed to identify the tools. Part (b) was well attempted with the majority of learners gaining some marks for the function of the components.
- Q3 A straightforward and generally well answered question, with a high proportion of learners gaining full marks.

- Q4 Good responses to (a) included products used in the pre-release materials for past papers or specimen assessment materials. Part (b)(i) generally well answered. (b)(ii) was answered well, with most getting 2 marks. In Part (c), learners generally provided an appropriate response to examples of automation.
- Q5 The majority of learners scored reasonably well for Part (a), giving reference to functions of CAD. For (b), most got a disadvantage for changing to CAD. Then in (c) most learners stated at least one function of CIM, (d) most learners got a low level benefit.
- Q6 Part (a)(i) had reasonable responses, many gave good examples to show their understanding. There were limited responses in Part (a)(ii) for disadvantages – most got 'high cost for set up'. Learners answered Part (b) some good responses, most gave one reason
- Q7 This question required an ability to provide specific responses by drawing upon specialist knowledge. Learners were asked to provide answers that related to the use of communications technology. Part (a) was generally a well answered question, with some learners providing generic responses, such as 'less waste/less emissions'. Part (b) was related to marketing. Most gave low responses for one mark each, as detailed in the mark scheme.

Section B **Based upon the 'bite alarm' pre-release materials**

- Q8 A reasonably well answered question for all parts. Learners were able to effectively explain, using notes and sketches, the function of the probes, outer case and the selector switch. The vast majority of learners had clearly undertaken some research

based upon the pre-release materials. Some responses with drawing failed to annotate 3 points on the drawing, thus not achieving full marks. It should be noted that full marks can only be attained with both notes and sketches – some learners omitted one or the other.

Q9 For (a)(i) & (ii), the correct sequence of stages is clearly outlined in the specification and centres should refer to it. Many learners gained full marks. Part (b) looked at the production planning stage, and was again generally well answered with maximum marks gained from low responses. Part (c) looked at the materials supply and control stage, and was answered well, with many gaining full marks.

Q10 Part (a) showed that many had done research on moisture tester probes and answered well.
Part (b)(i) elicited a varied response; however most could identify other production processes and most gained the full 3 marks. For Part (b), those learners that had studied injection moulding were able to offer some detailed responses. Most got marks for low responses. For Part (c), those who studied modern materials used in manufacturing were able to offer detailed responses.

Q11 For Part (a), simple responses were evident, but generally illustrated an understanding of the role of CAM. Many learners gave correct answers to (b), but as low responses for use of quality control in the manufacture of bite alarms, with few achieving maximum marks. In Part (c), those with an understanding of how a manufacturer uses quality control at the packaging and dispatch stage gave good responses.

- Q12 This question was looking at modern technology and modern materials, and where it was taught, good responses and most achieved full marks in (a)(i). The responses for (a)(ii) were of low level and the marks varied. In (b), there were varied responses to the benefits of modern materials and were of low response and identified the benefit.
- Q13 This question asks for the impact of control technology on safety. Many attempted the question and achieved some low response marks with reference to guarding of machines. As a ramped question, the few more-able had covered and identified other key points.
- Q14 A most learners sitting the examination paper this year attempted this final question. This is pleasing as it is a good examination technique for learners to attempt all questions, even if the response is an informed or 'educated' guess. Responses indicated that a number of students did understand how robotics improved the quality and efficiency of production and managed control of costs. Many achieved marks in level 2. As a ramped question, it clearly differentiates, and the marking scheme focuses on ensuring more than two issues are developed to gain full marks.