

Examiners' Report/
Principal Examiner Feedback

Summer 2014

Pearson Edexcel GCSE in
Application of Technology in
Engineering and Manufacturing

Unit 5EM03 Paper 3F
Mechanical, Automotive

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Mechanical Automotive

General Comments:

Overall, the two sections within this paper produced a good range of responses.

Lower ability learners often gave generic responses to questions, such as 'quick/fast/cheap' which gained limited marks. Despite advice in Examiners Reports some learners based their responses on an incorrect context and therefore did not gain marks. Disappointingly this was, again, the case in this series. The more demanding questions, especially at the end of Section B, were difficult for many learners and consequently a large proportion gave inappropriate responses.

It was extremely pleasing to see that the majority of learners attempted all questions and empty spaces were kept to a minimum throughout the paper, although the odd learner left almost the whole paper blank and without response.

Like any other external assessment, learners would benefit from being taught examination skills and techniques, as in this case often they did not read the questions properly, and 'describe', 'explain' or 'evaluate' questions were answered using bullet points as opposed to the 'state with additional text that describes, explains or evaluates'. This was sometimes the case in Q14 where learners are tested on their quality of written communication (QWC) and would therefore find it difficult to gain high marks.

Section A

Question 1

The majority of learners correctly identified the products belonging to the Mechanical sector in Part (a). However a significant number of learners failed to get both answers correct for Part (b) with the 'body panel' causing problems for learners who often incorrectly selected the 'anti-static mat'.

Question 2

Although the majority of learners correctly identified both tools used in the manufacture of Mechanical/Automotive products in Part (a) there was, however a number of learners who were unable to identify the 'spanner'. Also, in Part (b), many learners were unable to fully describe the use of the 'dividers' often quoting that it was holding things together.

Question 3

A straightforward and generally well answered question. Knowing that 'continuous operation' was part of control technology was key to achieving full marks.

Question 4

Good responses to Part (a) included products used in the pre-release materials for past papers. Again this year, this question required two responses and it was pleasing to see that learners had not responded with the excluded product, the sheet metal hand nibblers, as the subject for the question. In Part (b) (i), it was

disturbing that many learners were unable to state a control technology, often they gave answers relative to quality control which gained no marks and affected the opportunity to answer Part (b) (ii). A broad range of answers in the mark scheme meant that generally a range of marks were awarded as learners were able to explain reasons why the control technology was used. Part (c) was not answered very well, they found it difficult to understand what was meant by "material removal" and for (c) (ii) many gave an advantage and not a description.

Question 5

In the main, for part (a), learners gave answers that were about advertising and that no expensive shop would be needed. Part (b) gave a good opportunity for those who knew about the benefits to record what they knew and give good responses.

Question 6

Many were able to give two examples of electronics communications technology for part (a) (i); this year seen the introduction of some new technologies applied with the use of 'Skype' and 'Facetime'. Many found the context of urgently needed products a difficult one to scope a response around in part (a) (ii). In part (b) (i) it was disappointing that learners found it difficult to name a SMART material. Part (b) (ii) was usually answered well, although many gained there marks from two low responses.

Question 7

Centres are reminded that the paper is ramped in difficulty and the latter questions in each of the two sections are aimed at the more able learners. This question required an ability to provide specific responses, by drawing upon specialist knowledge of information and data handling systems. The answer needed a linked response and many were unable to achieve this. In part (a) many were unsure what 'product sales' was.

Section B – based upon the 'mass produced sheet metal hand nibbler' pre-release material

Question 8

There is an opportunity for all learners to display their knowledge and understanding of the pre-release product through sketching and notes relating to the functions of various parts of the sheet metal hand nibbler. In the main all three parts were well answered and it was obvious that most centres had let the learners investigate the product in a practical manner. Learners were able to effectively describe, using notes and sketches, the function of the coated handle, pivot bolt and the top handle frame. The vast majority of learners had clearly undertaken research based upon the pre-release material; those that provided incorrect responses often confused the requirement of the question, which was about function, with a need to state all they knew about the product and described the materials used and gave manufacturing details, all not asked for. Whilst it was very pleasing to see that the vast majority of learners were producing both notes and sketches centres and learners are reminded that both notes and sketches are required to be able to access full marks. Some learners only provided notes and therefore limited the mark they could gain.

Question 9

For Part (a) (i), around 8% to 17% of learners were unable to correctly identify the missing stages in the list. The correct sequence of stages is clearly outlined in the specification and centres should refer to it. Part (b) was surprisingly not well answered; some responses centred on activities associated with production rather than materials supply and control. Often responses in part (c) gained the marks from a range of low level responses rather than a detailed linked response; again many were confused between production and production planning, some answered about setting up for production, rather than the production planning activities.

Question 10

Part (a) was well answered, with those achieving at the lower end doing as well as the higher achievers. Part (b) (i) elicited a range of mixed responses, which was surprising; answers that gained the full 3 marks were not as many as expected, with some learners stating a stage. For Part (b) (ii), those learners that had studied the pre-release material were able to offer detailed responses in relation to why grinding is a suitable process used during the production of the cutting edge on the cutting jaws. The most popular answers centred on the surface texture aspects but some limited responses mentioned 'being sharp'. Part (c) was a difficult question for most and very few gained maximum marks as they missed the context of reducing environmental impact.

Question 11

Part (a) (i) proved difficult for some as they were not able to see uses beyond the actual 'drawing type' work, so were only able to access one mark. With Part (a) (ii), many learners did not give their answer in the context of the application during the packaging and dispatch stage of manufacturing and therefore found the full range of marks hard to come by. Some answers were however very good and it was obvious that these were from centres where the learners had either visited companies who had a clear packaging and dispatch function or watched videos about this. In Part (b) there was many empty spaces where learners had not even attempted any answer. Many also found part (c) very challenging as there was a thought process need to combine the impact of ICT in respect to design, development and also production. Often limited answers were around the use in design alone.

Question 12

Whenever there is this type of question learners get confused across the areas of workforce, working environment and global environment. Part (a) was generally answered in the right context but often learners were unable to gain the second mark in each response as they were only able to identify the effect and not extend their answer into an explanation. Some answers strayed into the responses expected for part (b) when statements were mentioned about the working environmental issues such being safer. A similar situation was found for part (b). Many answers in part (c) were about costs but they often did not show sufficiently what type of cost. Some good answers were seen however; such as cost of installing the automation, and those associated with the level of demand.

Question 13

This question proved very challenging for all learners. Many just identified all areas of the factory where heat is needed such as plastic dipping, heat treatment or central heating and/or where heat would be generated such as heat treatment or plastic melting. The most sensible responses recognised that heat could be collected and reused to warm water or to help pre-heat the polymer for plastic

coating activities. Some of the responses did make one think about how much heat the learners thought was being wasted, doing some of the incredible things they suggested.

Question 14

This question looked at QWC as well as issues of 'the benefits of using JIT techniques'. Where learners scored well, there were coherent sentences produced relating to JIT techniques clearly linking the benefits to what happens in manufacturing. It was surprising that not many learners mention 'kanban' in their discussion. Although the paper is ramped, it did give most learners the opportunity to test the knowledge of how manufacturers should think about improvements in efficiency. However, some learners used bullet points to respond to this question and therefore failed to score highly on QWC.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx>

