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Examiners' Report/ Principal Examiner Feedback

Summer 2016

Pearson Edexcel GCSE in Engineering/Manufacturing (5EM03) Paper 3F: Mechanical Automotive

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Grade Boundaries

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General Comments:

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

Although to a lesser degree this year 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 and there were some questions not attempted. Although with a limited number of entries an unusual feature this year was often a grade "C" learner could attract a wide range of marks from one question, some gained one or two marks for question 11 where others gained eleven or twelve to achieve the same grade.

Again, as in previous years, 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, often the last question was written on additional paper which often did not help learners as they then missed important points.

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

Q1 The majority of learners correctly identified the products belonging to the Mechanical sector in Parts (a) and (b).

Q2 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 'die holder, often referring to it as a 'die' or 'tap holder'. Also, in Part (b), many learners were unable to fully describe the use of the 'hand reamer' often guessing it had something to do with used on wood with a hammer.

Q3 A straightforward and generally well answered question often achieving full marks.

Q4 Strangely this year there were varied responses to Part (a) although many 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, a tube cutter, as the subject for the question. Many did seem to get confused and some struggled to name two products. Some gave another process and some, probably prompted by "turning" in the question named another machine such as a pillar drill or angle grinder – these responses were rewarded. In Part (b) (i), it was appropriate that many learners were able to state a material removal process. A broad range of answers in the mark scheme meant that generally a range of marks were awarded as learners were able to at least describe some parts of the turning process, although it was amassing how many did not know what turning was – "when you turn it moves the wheels" being one incorrect response. Part (c) was either answered very well or they found it difficult to write about

automation as a linked response.

Q5 In the main, for part (a), learners gave answers based upon their knowledge of CAD. Part (b) gave a good opportunity for those who knew about the disadvantages of introducing CAD to gain both marks. Some focussed on redundancy of staff and some gave advantages instead of disadvantages. Many struggled with part (c).

Q6 Many were able to describe the term database in part (a) (i), although often this was confused with a spreadsheet. A range of responses were given in part (a) (ii) but the most popular answer involved corruption with the computer software. In part (b) it was very disappointing that learners found it difficult to explain two reasons why a manufacturer would use an electronic spreadsheet.

Q7 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 using communications technology in a context of benefits to the global environment and when marketing a product. The answer needed a linked response and many were unable to achieve this. Some gave benefits in part (a) but did not relate to the global environment. Some seemed to be quoting responses from a previous mark scheme. Centres are reminded that the learners are only allowed to take in their own notes and sketches from their research and work on the pre-release product. In part (b) many answers were restricted to advertising type activities.

Section B **Based upon the 'mass produced 3 to 32mm diameter tube cutters' pre-release material**

Q8 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 3 to 32mm diameter tube cutters. 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 thread, moving jaw and the knob. 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 provider notes and therefore limited the mark they could gain.

Q9 Most learners gave correct answers for Parts (a) (i) and (ii). The correct sequence of stages is clearly outlined in the specification and centres should refer to it. Parts (b) and (c) were also well answered; some responses elicited a range of responses about design and prototyping for Part (b). Often responses in part (c) gained the marks from a range of low level responses rather than a detailed linked response; although many good linked responses were also seen.

Q10 Part (a) was well answered, with those achieving at the lower end doing as well as the higher achievers as there were few materials that would be suitable for most of the parts of the 3 to 32mm diameter tube cutters. Part (b) was answered well by most as die casting seemed to be a familiar process for most. For Part (c) was often answered in relation to melting down and reuse.

Q11 Part (a) proved difficult for a lot of learners as they were not able to give uses in packaging and despatch. Often response involved robots which unless phrased correctly gained minimum marks. In Part (b) there were many generic type response that attracted the mark for identifying the quality control procedure but were unable to follow this through with a linked response. This question appeared to be a dominant part of the grade individual learners obtained.

Q12 This was one of the poorly answered questions on the paper. Part (a) (i) often attracted a rewardable answer. Those who were unable to answer this first part also struggled to gain any marks for Part (a) (ii) and those who did answer often didn't understand the context of the working environment and tended to merge answers for Part (a) (i) with (ii). In Part (b) often responses had one answer about characteristics and one about sales but linked together as two low responses attracting two marks.

Q13 This question proved very challenging for most learners. More emphasis or focus was required on impact as asked for in the question. Where this was achieved the answer was appropriate and gained three or four marks.

Q14 This question looked at QWC as well as impact of 'robotics on production efficiency, product quality and manufacturing costs'. Where learners scored well, there were coherent sentences produced relating to robotics clearly linking the impacts in relation to either or all of production efficiency, product quality and manufacturing costs. Some learners used bullets points to respond to this question and therefore failed to score highly on QWC.