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Summer 2012

GCE Engineering

Unit 6932_01

The Role of the Engineer

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The Role of the Engineer

Around 45 centres were registered for this unit, with cohort sizes ranging from a single candidate, but more usually a seven or eight, up to a few dozen. Similarly, the ability range varies, along with the full range of scores, with the majority scoring in the 30s and 40s. Scores in the 50s are increasing, suggesting that some centres have a well developed information and guidance system, and teachers and resources are developing, as are links with industry and real engineers and their investigation. Without this link, the unit is very difficult to evidence and it cannot be studied or completed using notes and the internet alone.

Most centres submitted their moderation samples before or on the deadline. Most also included signed authentication sheets, OPTEMS or signed EDI printouts and had the correctly selected sample of candidate portfolios. The majority are now submitting work in the required format – being A4 paper, portrait mode, word processed and held together using a single treasury tag through the top left hand corner only.

All portfolios should contain the candidates' work, only, as no marks can be awarded for the work of others. Candidates are required to describe, explain and justify the use of certain standards, etc, and if done well, there is no need to include a copy of the standard, etc, either within the work or in any appendices. Some did copy and reduce the size of half a dozen forms, making them about a quarter of a page, then typing around them. This is good practice and is to be encouraged.

Many well produced and high scoring portfolios are now being seen, comprising between two and four pages for each of the six sections. Unfortunately, there is still a small number of centres where candidates produce portfolios without page numbers, without section headings that reflect the six assessment criteria 'a' to 'f', and some that have eight or nine sections, with long histories of the company they have visited. All company history is interesting, but attracts no marks, so half a page of introduction covering the company, the engineer and the product is more than enough.

Most centres complete the mark record sheet (MRS), indicating the type of evidence and where it is located, by page number, which is useful, but the most effective method of annotation is to also annotate the candidates' work by writing the assessment verbs for each criterion alongside the relevant paragraphs – such as 'MB2 explain' or 'MB3 justify' to indicate exactly where the paragraphs are that led the centre assessor to award the marks. A very small number of centres made arithmetical errors when adding up their candidates' final scores.

A reducing, and small, number of centres still appear not to have taken note of the requirement for the quality of written communication (QWC) to be taken into account. Centres are advised to follow the guidance in their centre reports, learning from their moderator's feedback.

Where the centres encouraged their candidates to leave their learning premises and find real engineers to investigate, the performance was expectedly better. This unit is about the investigation of the role of an engineer – and the only realistic way to do that is to find a real engineer and investigate his/her role – by asking them.

Assessment Criterion 'a'

Where candidates made contact with a real engineer, met them, identified the activities s/he carried out – and asked questions about what they saw, usually provided better reports than those who were given a class developed questionnaire, which attempted to target the specification, but mostly failed to do so. Design engineers can provide interesting and relevant details to address sections 'a' to 'd', but for a young engineer to evaluate their work as fit for purpose (e) can be difficult – so care is needed when allocating engineers from the outset. When candidates investigate the role of an engineer and that engineer's direct involvement on a product, better results are generally found than can be generated when investigating those who provide a service.

As in previous series, where description and justification for the tasks carried out by their engineer is required, some candidates wrote down everything they did in a typical day, which didn't work particularly well. Some followed a product from start to finish, which involved a range of engineers and they too missed some areas of the assessment criteria. Some candidates have been working closely with their own engineer on work experience or regular visits and these generally tend to perform better across the mark bands than those who all visit, or are visited by, one engineer who tells them of their work activities. The former leads to thorough portfolios, but the latter can tend to lead to a set of portfolios which are all very similar.

Assessment Criterion 'b'

Technologies – for this section, many candidates still seem to interpret 'technologies' to mean 'machines', or CAD or CAM, when this is only a small part of it – as shown in the specification. Most candidates included a mention of CAD use and several referred to CAM and a range of 'machine operations' such as turning, drilling, milling and laser cutting.

Communications and control systems, for engineering processes and of engineering operations, services, record keeping, monitoring, etc, all make use of technologies across many areas of engineering and tend not to be included in the majority of reports. Where candidates included the reasons for these technologies being used by the engineer, some good portfolios were produced. A lack of focus on the engineer, or the product which they are directly involved with, tends to limit performance to Mark Band 1.

Assessment Criterion 'c'

A good range of details were provided, here, by many candidates, but only the minority follow the thread through to mark band three and higher marks. As in previous years, 'c' and 'd' tended to be overlapped and confused by some candidates, and the moderators encourage flexibility and the allocation of marks for the contents, even if it is produced in the wrong section.

Some candidates mentioned a good range of standards, BS and CE, ISOs, etc, and the legislation for the environmental impact reduction, clean air act, etc, were thoroughly covered in some portfolios. Much of this is just 'applied common knowledge', but still needs to focus on the engineer and the relevant product. There were a few examples of contract law and rights of employees, but these were rarely related to the engineer or the product/service, so scored low marks. Non compliance was discussed by some candidates and high marks were achieved, but most didn't.

'Standards' tend to be general and their relevance to the product not clearly stated. Centres are advised to encourage candidates to learn about standards – such as BS, BS EN, CE, ISO, etc – and not just consider 'good standards' to mean, subjectively, 'a good job done'. Very few included details of how their engineer ensured that the standards were met, with many candidates saying, simply, 'because they have to', or similar, without saying what they actually did.

Assessment Criterion 'd'

The HASAW, Act 1974 etc, appears regularly, but little evidence was seen in the higher mark bands and in the main the descriptions were quite general and continued to lack the details of how they impacted on the product or engineer's role. Several included copies of class or employers' handouts or printouts from website research, and the relevance to the product was not made clear.

Many candidates performed quite well with this section, though there are still some who appear not to refer closely to the criterion. Many candidates described contents of certain legislation or standard, without identifying what the legislation or standard was – for example 'risk assessment regulations' - missing marks from mark band 1, but gaining some at mark band 2 instead. 'Identify' suggests that the health and safety standard, or associated legislation, should be named, but many referred to 'risk assessments' without mentioning the acts or regulations which require them to be done, such as the Management of Health and Safety at Work Regulations or PUWER and the rest of the 'Six-Pack' and their subsequent updates. The way companies interpret these to develop their own 'standards of working' are the expectation for this criterion, but they are rarely covered in any detail.

Assessment Criterion 'e'

The product under investigation must be simple enough for a 16/17 year old to evaluate and criticise effectively, otherwise the product or service is the wrong choice. Centres need to ensure that this is established very early on in the course of studies to save candidates from many hours of wasted research and writing around a product which is far too complex. Many candidates incorrectly wrote lengthy 'appraisal' reports about the engineer or the whole company and this is inappropriate. Candidates must be reminded that the subject is engineering, and their focus must be on the role of a particular engineer and the work s/he carries out, reflecting the title of this unit – 'the role of the engineer'. Inappropriate guidance with the choice of engineer and product/service meant that some of the evaluations were difficult to carry out. Often the statements were simplistic and some assessors had marked this section leniently. Evaluation of a service is more complex than for a product. Evaluation of a managing director's role is more difficult than for that of an electrician or plumber, so consideration must be given to 'e' and 'f' before candidates do much work on their chosen engineer.

Assessment Criterion 'f'

Following on from the evaluations, the modifications were quite simplistic in most samples, but this is a high level skill, and needs a good section 'e' to allow effective suggestions for improvement to be made. Very few candidates include diagrams to help with their explanations or ideas. Many suggestions were unrelated to section 'e' or contained trivial comments only, such as 'use low energy light bulbs' or 'pay them less' or 'work longer hours', etc.

A range of Professional Development and INSET training is available and sessions on assessment, delivery etc, have always been attended by small numbers. Bespoke training can also be obtained by contacting Edexcel – details are provided on the website, or centres can contact their regional office. Ask the Expert is also proving useful if a tutor has a query about the interpretation of the specifications or a candidate's suggested engineer and product or service. Details are also available on the Edexcel website.

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