

Examiners' Report

January 2011

GCE

GCE in Engineering 8731/9731

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Principal Moderator's Report

The Role of the Engineer - Unit 6932 - January 2011

General Comments

The majority of centres appear to have assessed a little generously this series, which may be as a result of some new teachers having picked up this qualification for the first time, or the fact that many of the candidates had resubmitted this unit after not achieving a high enough score last June or January.

Annotation is still lacking on the majority of portfolios.

The most effective and helpful form of annotation should consist of the assessor making brief notes on the candidates' scripts to indicate where there is evidence of 'MB3 - explanation' or 'MB2 - description' or 'MB3 - justification' which is required for the specific section's mark bands. Some use letters 'a' to 'f' in the margin, which is not necessary if the headings used throughout the portfolio reflect the six sections of the unit, and this gives no indication of where it is believed that the evidence sits across the mark bands. Many rely on the small boxes on the mark record sheet to provide annotation, but this is usually ineffective. Some centres left this blank, which does not provide any effective help for a remote moderator.

Assessment Criterion (a)

Some portfolios start with several pages of introduction about the company, all the people who work there, their history, etc, half a page is more than enough to make a realistic introduction to the company, the engineer, the product or service. This is not required for any part of the assessment grid. This section should start with a brief introduction, to set the scene, and the majority of scripts did just this. Others don't give introductions, but get straight into addressing the first criterion, which is exactly how the work should be presented, identifying the engineer (not the whole team, as in some cases) and some of the activities s/he normally carries out whilst at work is exactly what is wanted for mark band 1. Many candidates then develop this into relevant descriptions, with a few going on to address mark band 3 by providing clear explanations and justifications for carrying out certain activities which relate to the product or service. Some candidates can achieve top marks in this section, and the majority achieve 6 or 7, in 2 or 3 pages of work. Those who concentrate on the single engineer always do well.

Assessment Criterion (b)

Technology is still interpreted by many candidates to mean 'machines and tools' such as CNC, lathes, drilling machines, etc - and forget all about communications and the other pointers which are given in the specification. One candidate had chosen an engineer in the automotive industry and reported on MOT testing. Technology included the machines and tools used, but this could have stretched into MB3 if the DVLC had been mentioned and number plate recognition cameras, which allow police to check whether a car is taxed, tested or insured.

Assessment Criterion (c)

This section, and section 'd', tend to become one, or overlap and the guidance is to award marks for any material, whichever section it is included in, provided it is correct. Many candidates are now showing some understanding of what is required and ISO9000 and BSEN numbers are being quoted for the standards, as well as the range of legislation which influenced the design, but many are still having apparent difficulties finding actual details which refer to their engineer/product/service - indicating poor choice of product or not really talking to the engineer, perhaps. One area where candidates rarely perform well is in saying how the engineer ensures that standards are met.

Assessment Criterion (d)

Further to the comments made in section 'c', above, most candidates generally score half marks or slightly more. Health and Safety legislation is plentiful, and more arrives each year, and the HSE website gives many reminders and clues. The difficult, and generally ignored part, was, again, how it is ensured that the legislation is being worked to?

Assessment Criterion (e)

Only a few months after completing GCSEs, a candidate is being asked to evaluate and test a product as being fit for purpose. Many see this as a big challenge. Most tend to score between 7 and 10, without entering the upper mark band. For candidates to score 15 or 16 for section 'e', it is essential to discuss this with the engineer and with their tutor, then with the engineer and the selection of the right topic proves to play a major part in the likelihood of the candidate being able to evaluate it after testing. Care is always advised when the teachers/tutors are helping candidates at the very start of this unit, to ensure they are selecting an engineer and product/service which they will be able to effectively evaluate after only being on the course for a few months.

Assessment Criterion (f)

This follows on from the previous section's evaluation and testing. Some combine 'e' and 'f' by using subheadings, such as 'evaluative statement' then 'possible improvement' and others keep the two areas separate. A problem which involves sections 'e' and 'f' together is the potential for individual evaluation and improvements when each member of the group has worked with the same engineer. In every series, there are a few centres who have a handful of candidates which all report on the same company, engineer and even product or service. The difficulty arrives as the tutor tries to assess them after they have all written virtually the same. Whose idea was it? High marks can be gained by a candidate who investigates something different to everyone else. The advice is to find a different engineer and/or product for each candidate, or a different aspect of the product. The better advice, where candidates demonstrate their eagerness to study engineering, is where they all find their own engineer and spend time convincing the tutor that their investigation will generate evidence across all 6 outcomes across all 3 mark bands.

Principal Moderator's Report

Principles of Design, Planning and Prototyping - Unit 6933 - January 2011

General Comments

Only three centres entered candidates for Unit 3 'Principles of Design, Planning and Prototyping', in the January 2011 series of examinations.

Overall, participating centres awarded marks realistically and broadly in line with national standards.

Assessment Criterion (a)

All candidates produced appropriate engineering drawings, using some industry standard symbols and drawing conventions. Some drawings however were limited in their range and candidates did not make the most of their opportunity to use detailed pictorial views, assembly drawings, exploded views etc. Some drawings lacked important dimensions, while others were not drawn to scale, and there was not always enough information supplied to enable the successful manufacture of the designed prototype. Where CAD was used, this was carried out with expertise.

Assessment Criterion (b)

When planning their project, all candidates were able to produce appropriate timings with reference to processes. However, some planning was superficial and unrealistic. Planning usually included a time chart or Gantt chart, but sometimes lacked details of the sequence of events required to achieve a successful outcome within a realistic time span.

When writing a technical specification most candidates were able to identify some relevant points, but not many attempted to justify specification statements with additional technical information. Some specification points presented were superficial, lacking technical and measurable information that could have been used to evaluate the final outcome, and research information was hardly ever used to inform and develop the specification.

Assessment Criterion (c)

As always, this assessment criterion caused candidates the most problems. Most candidates presented a very limited range of alternative design ideas relating to their chosen project and it was obvious that some had already decided on a solution to their problem without any further graphical exploration. Most alternative design ideas were not well analysed in terms of possible materials and processes that could be used in their manufacture and there was little evidence of technical research information being used in the designs presented.

The review of alternative ideas was generally superficial and there was a lack of evaluation of design ideas against points of specification. Development of ideas into a final design proposal was generally weak, where most candidates were happy to present an initial idea as a final proposal without any further refinement.

In this assessment section, candidates are expected to explore a range of approaches to their work, using their knowledge of technical detail, materials, techniques and processes to produce realistic design proposals that match the points of specification.

As work progresses, alternative designs and their details should become linked and strands of continuity should be seen in higher quality responses as one idea moves to the next to be improved upon.

Effective annotation is an important feature of this section to enable candidates to explain details of design thinking and to offer evaluative statements regarding their design proposals.

In evaluating each alternative idea, it is important that candidates refer to points of specification objectively and avoid using tick-boxes or marks out of ten as a deciding factor in which design to select for further development.

Assessment Criterion (d)

Most candidates succeeded in producing a practical outcome to their chosen problem that reflected their final design proposal. Clear photographic evidence of manufactured outcomes was usually supplied, but this sometimes lacked the detail necessary to illustrate the complexity of task and the higher level skills credited by the centre. It is essential that good quality photographic evidence is presented in order to support the marks awarded by centres.

Not many candidates provided details of materials and their selection based on mathematical or scientific reasoning. Candidates would benefit in future from consulting materials data/performance information, or referring to the knowledge and understanding they have accumulated via their study of Unit 1 when specifying and justifying their choice of materials and processes to be used during product manufacture. During manufacture, candidates should demonstrate their understanding of a range of materials by selecting, justifying and using those that are appropriate to their needs in terms of properties and working characteristics that were detailed in the specification and work-plan.

Candidates must show demanding and high-level making skills in order to achieve the high category of marks in this section, so it is essential that the product under construction offers enough complexity to allow access to high marks.

Assessment Criterion (e)

There was appropriate evidence of oral presentations given by candidates and informative annotation regarding individual candidates' performance was well documented.

Principal Moderator's Report

The Engineering Environment - Unit 6935 - January 2011

General Comments

Most of the work submitted was deemed to be generously assessed. The work received was presented on A4 paper, with each learner's work being individually held together using one treasury tag through the top left hand corner. Anything other than this tends to impede the moderation processes. Most candidates reported on engineering work, with little reference to an actual engineer, which does limit the depth of detail which can be obtained. Some sections were addressed only partially, and this is usually due to poor selection of engineer/product.

Assessment Criterion (a)

Standards and Regulations - the portfolio contents were rather limited in this section, mainly due to the candidates not stating how and why they were relevant to the product or service. When a candidate regularly meets and speaks with a real engineer and asks about the regulations and standards which govern their activities, a much more thorough report is generally forthcoming.

Assessment Criterion (b)

Documentation used - a regular area of difficulty, particularly when an engineer isn't asked and this is done mostly as a web-search activity. Candidates need to be guided across the assessment criteria to ensure they understand what they have to include. Trivial comments were included in some portfolios and this limits scores to MB1. A description of how the documents are used and some justification could have easily raised the scores from MB1 to MB3.

Assessment Criterion (c)

Energy efficiency - this section was covered briefly and inaccurately in some instances. At least one portfolio contained information which had nothing to do with the product and nothing to do with energy efficiency. The requirement to meet the engineer and communicate with him/her regularly is essential for this unit. At least one portfolio contained a page or more which was taken directly from someone else's material on the internet.

Assessment Criterion (d)

Environmental impact - the guidelines given in the specification and teacher support material are intended to provide ideas on what to include here, but none of the portfolios had material which really went beyond MB2, and one or two were MB1, containing general knowledge statements which were not made relevant to the product or service. Most candidates appeared not to understand the key relevant environmental impacts of the product or service, and the engineer should have been able to help them with their research.

Assessment Criterion (e)

Technology and techniques used - most candidates tend to think of machinery as the only technologies and forget all about the communications technologies, probably because they assume everyone knows about mobile phones, SATNAVs, internet, but reporting how it is used and the impact on the product or service can gain some easy marks. QWC was not commented on by any of the assessors of the portfolios, although at least one candidate demonstrated good use of English, whereas another was rather weaker.

Assessment Criterion (f)

Evaluation and suggestions for modifications - not as difficult for A2 candidates as it is in AS, but many still seem to misunderstand what is needed, here. None of the portfolios contained material which would score above MB1 for this, which reflects on poor selection of product/service or lack of regular communication with the engineer.

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