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Examiners' Report

January 2010

Principal Learning

Engineering Level 2 Controlled Assessments

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Contents

1.	Introduction	1
2.	Level 2 Unit 1 Report	3
3.	Level 2 Unit 2 Report	5
4.	Level 2 Unit 3 Report	7
5.	Level 2 Unit 4 Report	9
6.	Level 2 Unit 5 Report	11
7.	Level 2 Unit 6 Report	13
8.	Level 2 Unit 7 Report	15
9.	Statistics	17

Principal Learning Engineering

Level 2 Introduction

The January 2010 series coincided with a long period of severe winter weather conditions which led to many disruptions. In general, much of the work submitted has been of a good standard and has been graded correctly by centres. The work submitted by these centres usually followed a logical format with a well developed and prepared 'brief' which was clear to candidates and allowed them to access marks across all Mark Bands.

As in previous series, aspects of centre administration were not properly addressed. OPTEMS/EDI must be included with samples. Front sheets should be correctly filled in with centre number, candidate number, candidate signatures etc. When centres submit the required sample they must also include the highest and lowest achieving candidate.

Again, as in previous series, candidate work should be annotated to indicate where and which Mark Bands have been allocated along with the number of marks awarded. This is not only good practice but will also aid the moderation process.

Some marking was lenient across all units. Centres must ensure they allocate marks in accordance with the Marking Grid and gain further clarification of mark allocation from the 'guidance for allocating marks' section of the unit specification.
In future, when centres are designing the unit assignment brief they would benefit by referring to the published Tutor Support Material as this gives clear guidance on how to present tasks so that candidates are able to focus on the evidence that should be presented – particularly with reference to gaining scores in Mark Bands 2 and 3.

Evidence presented for Marking Grid B was also variable. Good centres were able to provide evidence in the form of annotated photographs, detailed and individualised observation records as well as signed candidate work.

Level 2 Unit 1 Exploring the Engineering World

General comments
On some scripts the candidates did not seem clear on how to meet all the assessment criteria, particularly at Mark Bands 2 and 3. At some centres it seemed that the teaching and learning had not thoroughly covered all assessment criteria. Candidates showed some difficulty understanding the meaning of the action verbs used in the assessment criteria.
In some centres there was evidence of employers being involved in assessment activities –though this was generally not evident.
It would aid the moderation process if marks awarded by assessors could be directly attributed to a specific Mark Band for a particular Learning Outcome.

Standard of assessment
The standard of assessment was generally fair. Assignment briefs had not always been included with the evidence portfolios.

Administration
Due to weather conditions many samples were late.
Some samples did not include the highest or lowest marked work.
Some Candidate Record Sheets were incomplete.
Marks on the Candidate Record Sheet were not always completed.
In consortia where there was more than one assessor, internal moderation had taken place and there was evidence that some marks had been slightly adjusted. However it was difficult to be sure whether or not centres were part of a consortium and it would be useful if this were identified on the Candidate Record Sheet. Pages were not numbered in some candidate portfolios and on some Candidate Record Sheets there was no cross reference to page numbers – thus making it difficult to locate evidence for each Learning Outcome.

Learning Outcome 1
Most candidates had chosen two sectors. Sectors were generally well described and candidates were able to access Mark Bands 1 and 2 without too much difficulty. Some candidates described more than two sectors - which was not necessary. Descriptions often centred on individual companies rather than the sector and descriptions of products, function and operation. Where function and operation were covered, little detail was included. Candidates marks were generally fairly allocated but more depth of explanations would have improved the marks and accessed the higher bands.

Learning Outcome 2
Most candidates had identified four job opportunities. Many candidates relied too heavily on internet printouts of job vacancies or job descriptions. There was also limited evidence in many cases of qualifications required, and progression opportunities. It was evident in several cases that candidates had provided quite generic job descriptions. Description of the Engineering Council was weak. Many candidates did not cover professional institutions or the benefits of joining.

Learning Outcome 3
Most candidates had covered developments from three centuries .MB1 marks were covered well but the social and economic factors were sometimes not . One centre submitted evidence in the form of Power Point presentations which, due to their bullet point nature, only allowed for limited coverage.

Learning Outcome 4

This learning objective was not generally answered well. Roles and responsibilities were poorly defined and reference to relevant legislation was weak. Some centres focussed on the Health and Safety at Work Act to the exclusion of other legislation. Access to higher bands was therefore limited.

Level 2 Unit 2 Investigating Engineering Design

General comments
Overall the standard of performance appears to be the same as in previous series. There was the usual wide variation in marks between centres which understood the principles of delivery and assessment ,probably through training. Generally candidates that did well were from centres which had structured activities towards the learning outcomes with well produced assessment briefs. Where the given design brief related to a straightforward, focused requirement which could be translated into a clear specification, then candidates tended to produce good design proposals. Several centres set really complex briefs such as attempting to redesign an MP3 player, mobile phone, computer, scooter etc. all of which are beyond level 2 candidates subject knowledge; therefore many of the design ideas were superficial and cosmetic.

Standard of assessment
There was some evidence of centres not following the delivery guidance in the unit specification . Some candidates did not seem to be aware of the requirements for accessing Mark Band three. Assignment briefs were not always included with the evidence portfolios and this made the process of moderation more complex. A number of moderators raised serous concerns about the lack of annotation of candidate scripts.

Administration
Some centres failed to send the correct sample, OPTEM/EDI printouts were often not included and front sheets were missing from some centres. Also candidate numbers were not shown on sheets.
It was apparent that many centres were not entirely familiar with the administrative procedures and the requirements to enter marks onto the Edexcel Gateway – as well as printing and signing mark return sheets.
Most centres moderated, did however send the correct samples including the work of the highest and lowest candidates.
Not all centres returned signed Candidate Record Sheets (CRS), and a few errors in marks entered on-line were found and reported to Edexcel for correction.
A number of moderators raised serous concerns about the lack of annotation of candidate scripts. This was a problem identified with several centres, although interestingly there were centres where one assessor had annotated but another had not- something that a domain assessor should be picking up on. It was difficult to identify where the assessors had awarded individual marks, resulting in many scripts being re-marked rather than moderated.
A number of centres entered minimal detail in the LO section of the CRS- just page number references. This did not help the candidate's cause, particularly in cases where evidence had been missed and the wrong marks awarded.
Generally no evidence could be found of assessor decisions being reviewed by a domain assessor.
In consortia where there was more than one assessor, it was apparent that some had carried out standardisation whilst others had not. Where it had happened, there was evidence to show why marks had been adjusted. One moderator found it difficult to identify whether centres were part of a consortium and it would be useful, in future series, if this were stated on the Candidate Record Sheet.

Learning Outcome 1
Generally answered well. Many portfolios were supported by observation statements. In many cases all candidates had carried out dismantling and reassembly of the same item. Several centres had based the activity on a 13A plug and this was clearly not within the spirit of guidance given on page 156 of the specification. One was left wondering whether or not teaching staff had thoroughly read the specification.

Learning Outcome 2
Both strands of this Learning Outcome were covered reasonably well.

LO2.1 Several centres did not give candidates a design brief - which meant that many went freestyle straight into a specification.
LO2.2 A couple of centres changed the product for this LO therefore losing the developmental link between brief and specification.

Learning Outcome 3
The main problem here was candidates coming up with cosmetic ideas as a variation to an existing design, for example three different colours for the casing of an MP3 player. Some moderators felt that this unit may have been delivered by tutors with non-engineering backgrounds who were going for too much of a craft approach, for example colour and in one instance, paper and card modelling.

Learning Outcome 4
Most candidates achieved Mark Band 1. Where many slipped up was not putting enough detail into their design reports, for example, leaving out dimensions, materials, and manufacturing proposals - not enough information for a third party to be able to pick up the proposal and develop into a set of finished drawings. Hardly any candidates accessed the marks for showing mathematical and scientific calculations. There were some good portfolios from centres which had given candidates a structure to work to and followed the guidance in the unit specification.

Level 2 Unit 3 Engineering Applications of Computers

General comments
Witness statements were generally poor or missing and this issue needs to be addressed in the future. Missing signatures is a continuing problem and makes it difficult to authenticate evidence.
For the future, it would be beneficial to look very carefully at the 'guidance for allocating marks' section of the unit specification and to pick up on the finer details in the Marking Grids.

Standard of assessment
Overall the standard of performance appears to be similar to the previous series . It was evident that centres that had received training performed well.

Administration
OPTEM/EDI printouts were often not included and front sheets were missing from some centres. Candidate numbers were often omitted from candidate record sheets. Consortia sent work with no indication of which centre it was from. The numbers had to be obtained from Edexcel Gateway. Some centres responded very well to E6 requests, others were very slow and held up the moderation process.

A number of centres withdrew from this assessment series.
Not all centres returned and signed the CRS and a few errors in marks entered online were found and reported to Edexcel for correction.

Learning Outcome 1
Many candidates did not fully appreciate the meaning of the key words 'compare' and 'evaluate' and therefore did not access the higher mark bands. All found an example of a process control and a manufacturing application - many describing them in detail and gaining full marks for Mark Band 1. Evidence for band 2 was not so robust and many candidates had difficulty with Mark Band 3.

Learning Outcome 2
All candidates had been given a specific problem and most were able to solve it. For some the solution involved the sole use of simulation software making it almost impossible to award marks for working safely. In one of these cases the moderator did award the odd mark for candidate statements about following 'safe' IT procedures when starting up and shutting down the computer and simulation software.
Centres that gave candidates access to equipment such as a small bench robotic arm or sorting conveyor generally achieved much better results.
Justifications and appraisals for Mark Band 3 were in many cases badly done.

Learning Outcome 3
This was perhaps one of the weakest LO's for many candidates. The majority of candidates were able to give two descriptions, but often these lacked in detail. There was also lack of detail of the component parts of the systems, and limited evaluation. A further weakness was a lack of description about the transfer of the system to other products. Some candidates presented a significant amount of un-edited material cut and pasted from the Internet which is not recommended as a suitable form of independent work. Sources taken from websites should be appropriately referenced and candidates must show an understanding of this material.

Learning Outcome 4
This LO was on the whole well attempted, and it was clear that some candidates had benefited from seeing maintenance procedures in practice whilst on an industrial visit. Most had described two techniques, had identified the acquisition of diagnostic information, and had also identified how this information might be used for corrective action.

Level 2 Unit 4 Producing Engineering Solutions

General comments
The moderation process was hampered by adverse weather conditions. Samples were late arriving with Moderators leading to delays

Standard of assessment
On some scripts the candidates did not seem clear on how to meet all the assessment criteria, particularly at Mark Bands 2 and 3. At some centres it seemed that the teaching and learning had not thoroughly covered all assessment criteria. Candidates showed some difficulty understanding the meaning of the action verbs used in the assessment criteria.

Assignment briefs had not always been included with the evidence portfolios which made the task of locating evidence difficult.

It would aid the moderation process if marks awarded by assessors could be directly attributed to a specific Mark Band for a particular Learning Outcome by annotating candidate work.

Administration
Due to weather conditions many samples were late.
Some samples did not include the highest or lowest marked work.
Some Candidate Record Sheets were incomplete.
Marks on the Candidate Record Sheet were not always completed.

In consortia where there was more than one assessor internal moderation had taken place and there was evidence that some marks had been slightly adjusted. However it was difficult to be sure whether or not centres were part of a consortium and it would be useful if this were identified on the Candidate Record Sheet.

Pages were not numbered in some candidate portfolios and on some Candidate Record Sheets there was no cross reference to page numbers thus making it difficult to locate evidence for each Learning Outcome.

Learning Outcome 1
Most candidates had identified a range of H&S issues and generally had undertaken a basic risk assessment. Evidence was generally poor when describing the implications to self and others. Access to the higher Mark Bands could have been achieved by considering and comparing the implications of H&S for self and others, and by undertaking and interpreting more fully risk assessment results.

Learning Outcome 2
Most candidates were able to produce a plan showing processes, materials and in some cases timescales. Access to the higher Mark Bands could have been obtained by justifying the sequence on the plan, and by making a review and evaluation (along with improvements). This was carried out by candidates in some cases.

Learning Outcome 3
Attempted by most candidates. Access to the higher Mark Bands would be achieved by justifying the selection of the materials or components, and relating this to the article being made.

Learning Outcome 5
Evidence for this learning objective was weak. Some candidates at some centres had made no attempt at providing evidence. However, the better centres had provided records of comprehensive inspection and testing.

Learning Outcome 4 (Marking Grid B)
It is noted that some centres provided witness statements to support the evidence, which included photographs.

Level 2 Unit 5 Electrical and Electronic Circuits and Systems

General comments
The provision of witness evidence, in any form, was very poor from some centres, making it very difficult to give candidates proper credit when moderating. For some centres there was a statement for Marking Grid B. Generally more needs to be done by centres to provide suitable evidence for Mark Grid B.

Standard of assessment
Generally teacher assessment was accurate with a few exceptions. Although this unit is clearly written and considerable guidance is provided for assessment strategies, assignment briefs/tasks set by some centres was poor.
Calculations in LO1 are often confused and vague and not clear to candidates.
LO2 is straightforward and was generally handled well by centres but tasks to allow access to the higher bands was variable.
Generally LO3 was not tackled well by centres and candidates had problems describing the function of circuits chosen and operation of individual components.

Administration
Due to weather conditions many samples were late.
Some samples did not include the highest or lowest marked work.
Some Candidate Record Sheets were incomplete.
Marks on the Candidate Record Sheet were not always completed.

Candidate work was not often annotated which made it difficult to see where marks had been allocated.

Learning Outcome 1
Generally good evidence of safe working practices with an understanding of H&S issues. However the key word in the Mark Grid is 'demonstrate' which would allow for photographic evidence and Observation Records; few centres provided these. Calculations were variable. In many cases full working out was not evident.

Learning Outcome 2
Generally well handled by candidates with many candidates accessing full marks at MB1. More variable at Mark Band 2/3. Centres did not provide candidates with suitable additional circuits from which to select components. There was little evidence of manufacturer's data sheets or catalogues being used for component selection.

Learning Outcome 3
Candidate answers/evidence was generally weak. Very few candidates were able to give anything but very basic circuit descriptions or describe operation and function. Many candidates did not attract many marks at the higher bands.
Learning Outcomes 3 and 4 (Marking Grid B)
It is noted that some centres provided witness statements to support the evidence, which included photographs. It appears that many statements did not properly support evidence being presented for the higher Mark Bands and would have been an issue if Marking Grid B evidence were subject to moderation.

Level 2 Unit 6 Application of Manufacturing Techniques in Engineering

General comments
Overall the standard of performance appears to be the same as in previous series. There was the usual wide variation in marks between centres which understood the principles of delivery and assessment (probably through training) and those who appeared to have little knowledge.

Standard of assessment
Assessment was generally in line with the standards of the unit.
Some candidates did not seem to be aware of the requirements for accessing Mark Band three. Assignment briefs were not always included with the evidence portfolios.
There was a lack of assessor annotation on candidate briefs.

Administration
Some centres failed to send the correct sample, OPTEM/EDI printouts were often not included and front sheets were missing from some centres. Also candidate numbers were not shown on sheets.
A number of centres withdrew from this assessment round but did not update the Gateway.
It was apparent that many centres were not entirely familiar with the administrative procedures and the requirements to enter marks onto the Edexcel Gateway and print and sign mark return sheets.
Most centres moderated did, however, send the correct samples including the work of the highest and lowest candidates.
Not all centres returned signed Candidate Record Sheets (CRS), and a few errors in marks entered on-line were found and reported to Edexcel for correction.
It was difficult to identify where the assessors had awarded individual marks resulting in many scripts being re-marked rather than moderated.
A number of centres entered minimal detail in the LO section of the CRS- just page number references. This did not help the candidate's cause, particularly in cases where evidence had been missed and the wrong marks awarded.
Generally no evidence could be found of assessor decisions being reviewed by a domain assessor.
In consortia where there was more than one assessor it was apparent that some had carried out standardisation whilst others had not. Where it had happened there was evidence to show why marks had been adjusted. One moderator found it difficult to identify whether centres were part of a consortium and it would be useful if, in future series, this were stated on the Candidate Record Sheet.

Learning Outcome 1
Most candidates had provided a very general description of their team, and some had identified their role or roles within the team. The descriptions of personal role were, however, lacking in detail. There was also some evidence of personal strengths and weaknesses, but this was limited in detail. There was also limited evidence of how personal roles could be improved. A fuller description would give access to the higher Mark Bands.

Learning Outcome 2.1
Candidates were able to identify features from a given drawing, and some had explored these in detail. This LO was on the whole well answered by most candidates.

Learning Outcome 2.2
Some candidates did correctly understand the difference between a plan and a schedule, however, others were unable to distinguish between the two. Most candidates were able to produce a plan, which had details of the process and timings. Justification of the sequence of operations and schedule (where presented) tended to be weak.

Learning Outcome 4
This was perhaps one of the weakest LO's for most candidates. Three quality control (QC) techniques are required, one of which must be statistical. It was not clear from most answers what the actual technique was (e.g. how the measurements had been made). It was also not apparent that three techniques had been used.
For access to the higher Mark Bands, candidates also need to analyse the results against the specification, and comment about the production process. Some comment about production was evident in a few cases, although this had weak links to QC. A general weakness was not analysing reasons for success/failure and suggesting where improvement could be made.
Some candidates did not perform any quality control techniques. Where this was the case, the only evidence indicated against this task was drawings of measuring equipment and descriptions of how it would be used in a general sense. Some candidates who carried out proper measuring techniques were able to perform sound statistical techniques on data obtained.

Level 2 Unit 7 Applications of Maintenance Techniques in Engineering

General comments
For some centres the provision of witness evidence was very poor, making moderation difficult. For some centres there was a statement for Marking Grid B that covered some of the candidates but which should have been a Marking Grid A statement. In some cases there was a box in the task sheet that should have been signed by the assessor - this was not always done.

Standard of assessment
For a number of centres the assessor seemed to be unaware of the marking guidance. Generally marking was very lenient. Many assessors seemed unaware of the increasing requirements as you move across the Mark Bands.

Administration
A number of centres failed to send the correct sample. OPTEM/EDI printouts were often not included and front sheets were missing from some centres. Also candidate numbers were not shown on sheets. Consortia sent work with no indication of which centre it was from. The numbers had to be obtained from Edexcel Gateway. Some centres responded very well to E6 requests. Others were very slow and held up the moderation process.

Learning Outcome 1.1
Generally there was good evidence describing the maintenance types and justification of where they would be used.

Learning Outcome 1.2
Mark Band 2 refers to MTTF which is a measure of reliability for non-repairable systems. Many centres gave candidates data relating to MTBF- a measure of reliability for repairable items. This is perfectly acceptable because in the 'what you need to cover' section of the specification it refers to mean time to repair.
Many candidates either did not attempt this LO or they carried out calculations on given data but did not analyse or evaluate a trend. Achieving Mark Band 1 seems to be beyond the reach of most level 2 candidates.

Learning Outcome 2.2
Many candidates were able to devise a single maintenance procedure but in many cases did not make any reference to a procedure which they had carried out previously. All the candidates at one centre were directed to investigate the maintenance of a lorry and what they all produced was a service schedule rather than a procedure. They each presented a checklist for a 12000 mile service rather than homing in on a specific procedure e.g. servicing the brakes.
Detailed procedures for Mark Band 3 were thin on the ground; candidates did not cover tooling, documentation and safety practices.
At one centre candidates described how to set the vice up on a mill, this is generally considered a setting operation not an operation that you would call a maintenance engineer to perform.

Learning Outcome 3.1
A fair number of candidates described how to avoid improper maintenance, rather than describing how the impact of improper maintenance could be avoided. Very few candidates attempted the upper Mark Bands.

Learning Outcome 3.2
Some candidates were not provided with a given maintenance task so chose their own which in some cases was inappropriate.
At one centre all candidates were asked to identify spares for a bench mounted pillar drill but just produced a complete list of parts taken from the manufacturer's catalogue.

Learning Outcome 4
Risk assessments in general lacked clear H&S and warning sign detail.
Correct use of PPE covered reasonably well but storage was not properly considered.

Statistics

Level 2 unit 1 Exploring the Engineering world

	Max. Mark	A*	A	B	C
Raw boundary mark	60	53	43	33	24
Points Score	10	8	6	4	2

Level 2 Unit 2 Investigating Engineering design

	Max. Mark	A*	A	B	C
Raw boundary mark	60	54	44	34	24
Points Score	10	8	6	4	2

Level 2 Unit 3 Engineering Applications of computers

	Max. Mark	A*	A	B	C
Raw boundary mark	60	52	42	33	24
Points Score	10	8	6	4	2

Level 2 Unit 4 Producing Engineering Solutions

	Max. Mark	A*	A	B	C
Raw boundary mark	60	54	44	34	25
Points Score	10	8	6	4	2

Level 2 Unit 5 Electrical and Electronic Circuits and Systems

	Max. Mark	A*	A	B	C
Raw boundary mark	60	54	44	34	25
Points Score	5	4	3	2	1

Level 2 Unit 6 Application of Manufacturing Techniques in Engineering

	Max. Mark	A*	A	B	C
Raw boundary mark	60	52	43	34	25
Points Score	10	8	6	4	2

Level 2 Unit 7 Application of Maintenance Techniques in Engineering

	Max. Mark	A*	A	B	C
Raw boundary mark	60	53	43	33	24
Points Score	5	4	3	2	1

Notes

Maximum Mark (raw): the mark corresponding to the sum total of the marks shown on the Mark Scheme or Marking Grids.

Raw boundary mark: the minimum mark required by a learner to qualify for a given grade.

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