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Examiners' Report June 2009

Principal Learning

Engineering
Level 3

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Level 3 Introduction

The first year of this award has been a mixture of excitement and disappointment. As part of the embedding and development process, and to support the INSET events, Edexcel offered to send senior examiners to visit centres and consortia and provide support across a range of topics, all of which were different on every visit. Overall, the centres which are delivering this qualification are working hard and, pleasingly, successfully to implement the largest range of changes ever required to establish the new Diplomas. Links with industry are being developed and collaboration is being observed across schools, private training providers, FE colleges, sixth forms and universities – as well as industry – to generate the applied learning which is so important for preparation of our future industrial employees/leaders.

The number of centres who registered learners was lower than expected, but the trend seems to be set to increase from September 2009, according to feedback received from consortia during and after senior examiner visits to address a range of queries at many centres across the country. Many centres had concerns over controlled assessment, and the guidance in this has expanded. The best guidance of all is to advise all teachers that the assessment of each unit for each qualification is down to them and subjected to moderation by Edexcel. As they have to take responsibility for signing the authentication details, signifying that the work is all that of each individual learner, the guidance provided in Annex E (May 2009) has been developed to provide guidance and support, but they also need to refer to their consortium's assessment policies which will have probably developed from existing exemplars of good practice.

A common feature of concern at many centres has been the separation of teaching and learning from assessment. Assessment for learning is part of the teaching and some good examples of this have been reported during the many centre visits and in discussion at INSET events. If more guidance is required, the Edexcel team would be more than happy to provide this.

The final mix of pleasure and disappointment came with the entries for June 2009. The Unit 1 examination performed very well with high success rates overall, but the number of centres who submitted work for moderation was again much less than expected. When contacted, the general responses from centres was that the teaching staff didn't know that 5 June was the deadline for work to be with their moderator, some didn't know they had to send it, some thought a moderator was to visit them, and some had been surprised by the content requirements and appeared to have taught too little of the units at too great a depth, so they were not expecting to complete the units until early into the second year.

If one item was to be selected from the things which were not evidenced at moderation, it is the distinct lack of any evidence of standardisation of internal verification or second marking being undertaken across a consortium. The problem with not carrying out these activities is that the responsibility, and potential blame, for something being good, or something being absent, weak or malpractice, is not monitored and acted on within the collaborative features of a consortium's quality assurance procedures. The Moderators feel that this is further evidence that assessment should form part of everyone's INSET and PD&T from September 2009, particularly the lead and domain assessors and overall quality managers of consortia.

Internally assessed units

Although the number of submissions were low, there were enough to indicate that many centres believe moderation to be some kind of presentation exercise and many portfolios were bundled in all kinds of packaging, plastic folders, lever arch files, comb binders, etc. All that should be sent for moderation is the paper, generally A4 with a few technical/engineering drawings on A3 folded in half, and the work of each learner being held together using one treasury tag through the top left hand corner ONLY. Anything more than this impedes the processes of moderation and awarding. The work should be able to lie flat on a desk, be easy to turn from one page to the next and present no major dismantling operations to prepare for photocopying, as needed.

For a number of learners, the use of the internet was obvious. Where this occurs or where two or more pieces of work are identical, malpractice may be suspected, and the work is sent by the Moderators to the Compliance Unit at Edexcel. This can lead to a delay in returning the work, reduction of marks, or total removal of the scores awarded for the centre. Please ensure each learner's portfolio contains their own work, and any material which must be taken from the internet or other source is suitably referenced, and awarded zero marks. Only learners' work can attract marks.

Units 4 and 5 had no work submitted for moderation, which suggests that these may be causing problems with delivery or assessment, or they are being left until the second year.

Level 3 Unit 1 Investigating Engineering Business and the Environment

General comments
It was pleasing to see that the majority of learners made an attempt at all the questions in this examination paper, with only a small number returning a blank response for a small number of questions.

The majority of learners had clearly been prepared very well for the examination by their teachers and the use of the Sample Assessment Materials helped to develop their familiarity with the format of the examination. The papers are generally designed to provide some ramping in difficulty from start to finish, and to provide further differential ramping throughout each of the short and long answer questions of Sections 2 and 3. This ramping had the desired effect and gave all learners the opportunity to perform in a manner which reflected their level of preparation.

Question 1
Most learners performed well on this question by recognising the sectors of engineering which are most likely to be involved with the design of the wind-up charger for mobile phones.

Question 2
The majority of learners selected the correct response for this question, with many of those who didn't stating 'continuous/flow' or 'high volume/mass'. This is perhaps a result of not fully reading the question, which was about the manufacture of the drinks can making machine, not about making drinks cans.

Questions 3 and 4
These were mostly answered well and learners demonstrated their knowledge of the different classification of companies and the roles and responsibilities within an engineering company.

Question 5
Although this was answered correctly by the majority of learners, several selected the same wrong answer 'materials requisition' rather than 'specification' as the document where detailed dimensioning requirements would be found. The materials requisition would only contain details of material amounts or lengths being requested as stock.

Questions 6, 7, 8 and 9
These were generally answered well. Again, roles and responsibilities appeared to be well understood (Question 6) by the majority, along with direct and indirect costs for Question 7. Several learners appeared not to have read all the possible options for Question 8 and guessed, there being no predominant wrong answer chosen. With the majority selecting the correct response to Question 9, this topic was also taught well, and those who did get this wrong tended to select (a) or (b) because they both contained the word 'equal' and this has some relation to 'balance' in balance of payments, or so it was believed.

Question 10
First aid box contents caused some problems for many learners. The majority of wrong responses had gone for item 'self-adhesive dressings' instead of 'aspirins'.

Questions 11, 12, 13 and 14
These questions were correctly answered by the majority of learners. Question 11, relating to choice of PPE, was answered correctly by almost everyone. Questions 12-14 were answered well, showing that many learners read the questions, as these questions all had negative stems which asked for a response which did not meet certain criteria.

Question 15
A significant number of learners suggested the incorrect answer of an 'annual report' rather than 'materials requisition'. Perhaps they confused the requisition with an order form for parts or materials, or they believed the annual report was not a public document.

Question 16
A significant number of learners did not identify 'predictive' as the appropriate method of maintenance for a nuclear reactor. A few responded with 'reactive', perhaps through an unfortunate association with the word 'nuclear'.

Question 17
Many learners who answered incorrectly did not take into account the compound nature of depreciation but the majority had worked this problem out correctly.

Question 18
Many learners failed to identify 'mercury' as the most harmful by-product of burning coal.

Question 19
This question was generally well answered but the negative style of stem does tend to trip up learners who don't read the questions properly and opt for the first answer which is deemed to fit the requirements of the incorrectly read question.

Question 20
A significant number of learners suggested answer (c) rather than the correct answer (b), suggesting that detail of particular regulations is an area where differentiation exists, as expected.

Question 21
This question was generally well answered by learners, although a significant number made reference to the responsibilities of employees rather than the employer. A small number also seemed not to have read the 'Health and Safety at Work Act' part of the stem, and made comments about general responsibilities.

Question 22
The quantity required, materials needed, time available and equipment/tooling requirements were common answers for this question and achieved good marks. Weaker learners had apparently looked through Section 1 and copied four responses from a multiple choice question which contained the word 'plan'.

Question 23
The majority of learners performed well at this question, with many giving appropriate business responses. For this series, credit was also given to learners who made reference to personal income/expenditure as this was not made clear enough in the question and rewarding learners for correct responses to questions is our intention.

Question 24
There was a distinct difference between learners who performed well and those who did not. The better responses tended to consist of accurate charts being drawn, with correct labelling of the axes. This could then be used to ascertain the appropriate loss. Weaker responses tended to be drawn with little accuracy, incorrect or non-existent labels for the axes. Many learners did not get the correct value of the loss, despite it being possible to calculate from the table given.

Question 25
There is a significant lack of knowledge and understanding of the role of Regional Development Agencies in the UK. The majority of learners failed to achieve more than 1 mark for this question, with general statements such as 'to help businesses to set up' or 'to provide advice to businesses in the area' being common. This was the least well answered question on the paper, despite RDAs being explicitly stated in the specification.

Question 26
In part (a) learners were able to identify one advantage to the manufacturer in the majority of cases. This tended to be a reference to reduced costs or being able to focus on a particular market. Fewer learners however achieved the full 4 marks for this question. Again, learners appear not to have read the word 'describe' and decided to just 'identify', achieving partial scores.
Part (b) was not answered well by the majority of learners, who were unable to identify the cost benefits of reducing duplication. Many incorrect answers referred to issues such as a common language etc.
In part (c) most learners achieved good marks, making reference to both the business and the nations involved, the economic benefits and the social benefits of employment.

Question 27
Despite a similar question being included within the Sample Assessment Materials, many learners were unable to identify the dummy activity in part (a), nor were they able to determine the earliest completion time.
Part (b) was generally well answered, however, with credit being awarded to learners who gave specific areas of concern for the risk assessment. Learners were not rewarded for statements which provided duplication i.e. determine the risk of falling, determine the risk of electrocution.

Question 28
The majority of learners who attempted this question were able to gain good marks, many making reference to manufacturing and/or transportation issues.

Level 3 Unit 2 Applications of Computer Aided Designing

This unit has obviously caught the enthusiasm of some centres and good links with industry have lifted the content of this unit from a series of mundane drawing tasks to the production of real and imaginative examples of engineering CAD work.

This unit was one where some centres submitted incomplete portfolios, with some Learning Outcomes not evidenced, either through running out of time or from learners not attempting it all. Some centres used the Edexcel TSM examples as their assessment documents, and they worked reasonably well. Others modified them to suit the resources they had available.

In general, for this unit, the assignments used to make up the portfolio were well defined and for the most part were accurately assessed.
Some portfolios were submitted in an incomplete state with no evidence submitted for some of the elements. Consequently the marks obtained by learners reflect this rather than the standard of submitted work, which was generally good.

Learning Outcome 1
Where learners had attempted this section, the identification of component parts was well covered but the applications and comparison of data storage was generally not covered in much detail by comparison with other evidence submitted. On occasions, the use of a comparison chart might have aided assessors since the evidence presented for the higher Mark Bands was not always easy to identify. Many seemed to evidence the different types of storage but failed to mention any relevant application, how CAD itself would have made a perfect example, particularly the step from 2D to 3D and full rendering, or the speed and memory requirements.

Learning Outcome 2
This Learning Outcome was evidenced by many learners who gave poorly detailed descriptions of AutoCAD, which appeared to have been taken from their website, with little or no attempts being evidenced to show that learners had investigated the actual software itself.

Learning Outcome 3
Many learners attempted this practical element with some good examples of the required evidence being generated. However, not all the drawings required by the Marking Grids were included in every portfolio. The assessment for this Learning Outcome was generally quite accurate. Many drawings were lacking proper borders, as expected on engineering drawings to BS8888. However, the quality of drawings was the main evidence for picking up good scores, and some learners submitted some very good work.

Learning Outcome 4
The use of 3D software was demonstrated quite well by most learners, although many of them seemed limited in the range of items they had to draw. Some learners demonstrated proficiency in the use of the software and had obviously become enthused by the activity and by the item they were drawing.

Learning Outcome 5
Not all learners submitted work for this Learning Outcome but those that did contained a full range of marks demonstrating a full range of abilities or interest.

Level 3 Unit 3 Selection and Application of Engineering Materials

Learning Outcome 1

The material received for moderation contained a range of methods of taking work from the internet and using it to answer the tasks and address the Mark Bands. It is recommended that centres advise their learners that some referencing is essential, because any work which looks like it has been copied from another source is tested at moderation, and a suitable response decided on following the findings. This topic is challenging in that it requires descriptions of material structures and using the information available seems to present some difficulties for some learners.

Learning Outcome 2

The responses to this Learning Outcome were generally good and assessed accurately. Because Learning Outcome has two sections (2.1 and 2.2) which each attract 9 and 7 marks respectively, it is recommended that centres assess these separately and provide some annotation to allow the Moderators to see where the marks have been awarded. For Learning Outcome 2.2 there needs to be evidence made clear to the Moderators what the 'given information source' is. Not all learners included these details, and some provided much evidence of searching the internet, suggesting that they may not have been given any information, as required by the Learning Outcome.

Learning Outcome 3

The samples seen by the Moderators suggest that this Learning Outcome is also being evidenced by using details from the internet, without referencing and, on occasion, without modification or interpretation. Assessors need to ensure that the work submitted and assessed as the work of a learner is actually their own work and not taken from someone else.

Learning Outcome 4

The testing and calculations required to address this Learning Outcome were reasonably well evidenced by most of the learners. At least one of the centres who submitted work had provided some effective annotation to help a remote moderator evaluate the assessment decisions. This is good practice and is strongly encouraged.

One point which needs to be made concerning this unit, and others, is the need for a centre and/or consortium to refer to their assessment policies and procedures to ensure they are all aware of the requirements when carrying out the controlled assessment. The use of the internet as a source of information is acceptable but the material submitted for assessment must be the work of the learner only – and the assessor's signature confirming this authenticity should be taken with some seriousness. It was apparent that one centre had detected the plagiarism and assessed it accordingly.

Level 3 Unit 4 Instrumentation and Control Engineering

There were no entries for this unit in June 2009.

Level 3 Unit 5 Maintaining Engineering Plant, Equipment and Systems

There were no entries for this unit in June 2009.

Level 3 Unit 6 Investigating Modern Manufacturing Techniques used in Engineering

General comments

The material seen for this series served to indicate that a reliance on research alone, instead of teaching, does not prepare learners for the assessment of this unit. Without a series of tasks which specifically address the Learning Outcome across the Mark Bands, the assessment of learner performance becomes uncertain.

Learning Outcome 1

The samples seen suggested that Mark Band 1 was easily addressed by comparing modern and traditional manufacturing production systems but Mark Band 2 and 3 present a far greater challenge. The Sample Assessment Material provided in the TSM (available via the Edexcel website) contains a range of tasks which address the Mark Bands and it is recommended that these be used, and modified to suit resources, by centres unless they are confident that their domain assessor has accurately checked the assignment tasks being used against the requirements of the specification and the Marking Grids.

Learning Outcome 2

This Learning Outcome was evidenced well but it tended to lack specific detail about specific manufacturing industries or products. No evidence was submitted which addressed the justification of choice of processes and level of automation required for Mark Band 3.

Learning Outcome 3

The work seen for this Learning Outcome was not done very effectively. The planning for production and use of critical path networks requires a real process to be considered allowing consideration of a range of activities with possible improvements following from this.

Learning Outcome 4

Producing appropriate charts and documents for quality control appears to have been limited to searching for something on the internet, and as this does not allow consideration of a real product, the higher marks are almost unattainable.

Level 3 Unit 7 Innovative Design and Enterprise

General comments

To research innovative designs and enterprise, the internet is a useful tool. One tool which needs passing on to many learners is the use of some kind of referencing technique to indicate whose work they are submitting, and on occasions this was submitted with little modification or amendment.

In general, the unit did not generate the excitement of innovation and new products which the course designers would have hoped for, but it is expected that with INSET and further development, this unit should become one which is favoured by many learners.

Learning Outcome 1

The range of scores were from just into Mark Band 1 to just into Mark Band 3, but the weakness appears to be the explanation of what led to the success of the products. It does need pointing out to learners that the internet provides a lot of information but rarely does it provide details which can address the full range of Mark Bands. This needs information from another source, or preferably from the person or persons themselves. Finding this can be more tricky, so guidance with choice of product is essential.

Learning Outcome 2

As with Learning Outcome 1, the weaknesses seen in the small number of portfolios submitted for this series is the provision of the factors which led to the success. The internet alone cannot provide answers. It does provide details, which learners then need to make use of to correctly evidence the Marking Grids.

Learning Outcome 3

This outcome requires learners to concentrate on engineering activities associated with designing and making products and how they impact on society and the environment but the samples submitted for moderation appeared to have concentrated on the impact of the products themselves.

Learning Outcome 4

Where group work is used for this, or any other unit, care must be taken to ensure that each portfolio is different and the individual work of each learner has been identified. Where samples contained group work, this was not done well because all the portfolios were very similar, which did not allow individual learner work to be assessed or moderated effectively. Where products from Learning Outcome were 're-designed', it seemed that little had been learned from Learning Outcomes 2 and 3 and each Learning Outcome appeared to have been taken as a standalone assessment. The majority of the units in any Diploma are designed to allow follow through and lead to development of understanding as they are studied. It is hoped that this will improve after the first year of presentation.

Learning Outcome 5

All the samples moderated lacked the analysis needed for Mark Band 3, and many of them were just about satisfactory and met Mark Band 1. Many portfolios were assessed a little generously for this Learning Outcome, suggesting that the learners were not fully prepared or they ran out of time and rushed the assessment.

Level 3 Unit 8 Mathematical Techniques and Applications for Engineers

General comments

The majority of centres delivered the papers for marking on time, and the necessary paperwork was generally completed appropriately. The papers arrived for moderation in learner order which reflected the order on the OPTEM/Attendance Register – making marking and recording of scores straight forward.

The performance of learners covered almost the whole spectrum of scores. The performance of several learners appears to show that they were not ready for this examination at the time they sat it, either by it being taken too soon in the course of their studies or their preparation for it was inadequate.

As with all examinations, it is essential for learners to show all their working, but many seem not to understand what this means. There are generally marks awarded for using the correct steps and processes, but the main marks are for the correct answer – which is fine when it is correct, but a wrong answer may be the result of a simple mathematical or calculator reading error. If the working is shown, and correct, the majority of the marks can be awarded to learners even when the answer is slightly wrong due to such an error. Showing working is essential in demonstrating understanding of the problem and the technique required.

Question 1

(a) Rearranging and solving equations is an essential part of everyday engineering, and the majority of learners performed well with this task. Several had problems with the square root rearrangement and didn't take the root of all the equation, and some didn't attempt it, which is worrying for a Level 3 learner.

(b) This task was set to assess how well the learner could make use of the laws of logarithms, but the wording of it led to several learners solving the problem 'using' logarithms, which demonstrated some knowledge. Being trainee engineers, there was a problem to solve, and they solved it. Many performed well, and almost half stopped at 0.602 instead of finding the antilog to get the answer 4. In such instances, marks are awarded, but not all of them. The majority of learners made some attempt at this question, and several achieved a high score.

(c) Rearranging logarithmic expressions and substituting values appeared to be a weakness across many of the papers submitted. Basic knowledge of algebra does not normally equip a learner to guess at the solution for this type of question, but some seem to have relied on this, believing that logarithmic expressions can be treated exactly the same way as algebra, suggesting that, for example, logx means 'log' multiplied by 'x'. Several appeared to have no obvious understanding of the logarithmic expression format or of exponentials, or of the understanding of 'e' and how it related to natural logs.

Question 2

(a) For this task, there were two parts, each with two results to achieve and many learners stopped after the first one, or just did the second part. Drawing a graph was generally achieved but several tried to force the line through the origin, from all directions, and at least one learner produced a bar chart instead. SI units for velocity and distance were seldom used and teachers are advised to insist on the correct use of these throughout the course to avoid losing marks at assessment or moderation.

(b) Factorising was not done very well by many learners. Several, again, got part of the solution, but very few completed this question totally. Several potential engineers made valiant attempts at problem solving, even though they didn't get the correct answer or use the correct technique.

(c) Most learners made some attempt to solve the problem to find the unknown, and some used the formula method. The majority of those who tried to use the formula method got it wrong. Several only found one value for 'x' and some found them both, but got the polarity wrong.

Question 3

(a) A mixture of sine, cosine and tangents were used to solve the two unknowns, and many learners found the answers, within reasonable tolerances for rounding. The weaker learners fell down when they had to rearrange equations. Most knew about SOHCAHTOA, or equivalent, but some appeared to believe that tan23 = d/7 could rearrange to d = tan23/7 or 7-d = tan23, which indicates a lack of understanding beyond the rudiments of algebraic techniques. Several learners reverted to drawing to scale and measuring, but some of these had trouble working out the scale or made other mistakes. Most were comfortable with Pythagoras, but a range of techniques were observed for finding the correct solution.

(b) The vast majority obtained full marks for drawing a sine wave, most of them with the correct amplitude and offset brought about by the '3+' in the expression. Many plotted points accurately, but didn't sketch the waveform, although where it could be seen that the points were correct, marks were awarded for this.

(c) Far too many learners assumed, wrongly, that this was a right angled triangle and tried Pythagoras again, to get the wrong answer. The sample of the cosine rule at the front of the question paper appears to have been found by about half the learners. Teachers/invigilators are encouraged to make sure their learners are aware of the formulae and remind them to look through the paper before starting any question.

Question4

(a) Working out volumes was generally done successfully but there were learners who wrote down the correct answer only. Learners are to be reminded that although a correct answer may attract all the marks, if it is slightly wrong they score zero, whereas a wrong answer with correct method and workings shown generally attracts most of the marks. A few basic errors were observed, such as volume of block = 12 x 75. Some converted to metres and made mistakes with powers of ten and units, some converted to scientific notation and a few made mistakes with this. Either method is acceptable but a check is always worthwhile.

(b) Many learners got all of this question wrong and some wrote down answers which had no resemblance to the solution or the problem. Those who used radians generally did well. Several appear not to have realised their significance, and others saw the right angled triangle and produced all manner of incorrect solutions.

(c) Again, radian measure appeared to be a new concept to some learners and many forgot to include π in their calculations. Some even appeared to have guessed at a number and written it down. A handful arrived at 79.6 revs per second, then wrote down 79.6 rpm. Many learners scored full marks for this question.

Question 5

(a) All except a few achieved full marks for this section, by producing a histogram, although a few generated a line graph, but these were adequately rewarded as long as they had taken data from the table and put it in the correct place on the chart. A handful missed out one or more set of values, but mostly this question was answered well.

(b) Less than half the learners appear to have understood the differences between the averages in this task, although most of the learners calculated the mean accurately, at 19.57, then proceeded to round it up or down to a whole number, losing marks for accuracy.

(c) The number who could state a statistical observation from the results was only in single figures across the whole entry. The answer required should have mentioned that all three averages were less than the nominal size of the shafts, or that the data indicated a skew to the left, or similar. Too many relied on the obvious, such as 'the bars start off short, get longer in the middle, then reduce to the right'.

Question 6

(a) The majority of learners correctly drew a tangent at, or very close to, the '2 seconds' point on the curve. Many drew triangles and some joined the two bottom ends of the curve with a straight line, apparently not understanding the word 'tangent'. The majority then added triangles to obtain a gradient, but many forgot to indicate that the velocity was decreasing. Several ignored the SI units.

(b) Many learners left this whole question blank, indicating they had run out of time or hadn't attempted for some other reason. Interestingly, several learners did well with sections (b) and (c) having left (a) blank. Very few actually demonstrated an understanding of the processes of differentiation, but marks were awarded if '-6t' appeared in the response, indicating some basic knowledge of the processes of calculus.

(c) A small number managed to achieve full marks for this question, but very few demonstrated any understanding of integration as the reverse of differentiation. Many of these, however, did copy the correct formula from page 3 of the paper, but made little use of it thereafter.

Level 3 Unit 9 Principles and Application of Engineering Science

General comments

This unit is generally seen by the Moderators as being the most comprehensive of this Level 3 qualification. The broad range of contents is there because of the industrial spread which was involved with the design of the qualification, and the range of scientific skills required has made this a very tough unit. That said, any learner who achieves a high score can rest assured that their efforts have been well rewarded and the response from industry and university will be beneficial for progression to degree/HND study.

It is apparent from the work submitted, and from the visits made to centres, that too much material is being covered in each Learning Outcome of this unit. Bear in mind that for 90 hours, each of the six Learning Outcomes should thus be allocated approximately 15 hours, including assessment. From this, the amount of material and the depth of coverage should be gauged.

Learning Outcome 1

The work seen for this unit indicated some reasonable efforts had been made by some learners, but many errors were detected in the use of SI Units. The use of the TSM provided as an example on the Edexcel website appears to have been used, and little modification is required to make this suit the resources in the majority of centres. The assessment was quite accurate for the portfolios moderated.

Learning Outcome 2

Use of the TSM was clear, and assessment was, again, fair and accurate on the portfolios moderated. Attempts at the higher Mark Bands were not clearly annotated, although the assessment score was agreeable to the Moderators.

Learning Outcome 3

The coverage of electrical circuits was generally evident, and done well, but the lack of electromagnetism material held the scores lower than they might otherwise have been. The work seen, and the assessment decisions, were on the whole accurate.

Learning Outcome 4

The work moderated for this Learning Outcome contained several SI unit errors, and although the work submitted by the learners contained these errors, the assessment decisions were deemed to be a little generous.

Learning Outcome 5

Unless the centre is close to one of the petrochemical/oil refining areas of the country, finding real engineering examples of this Learning Outcome may be challenging. Collaboration with industry is almost essential to allow good coverage of this unit, and in particular, this Learning Outcome. Where collaboration between centres and other providers has taken place, the benefit will be seen in the applications which are used to help deliver and assess this unit. Some of the portfolios moderated suffered from lack of originality, and centres are reminded to refer to their assessment policies with regards to the administration and monitoring of the controlled assessment.

Learning Outcome 6

This Learning Outcome mainly covered Mark Bands 1 to 2 and assessment up to Mark Band 3 was deemed to be rather generous on occasion.

Statistics

Level 3 Unit 1 Investigating Engineering Business and the Environment

	Max. Mark	A*	A	B	C	D	E
Raw boundary mark	60	54	48	42	36	30	25
Points Score	14	12	10	8	6	4	2

Level 3 Unit 2 Applications of Computer Aided Designing

	Max. Mark	A*	A	B	C	D	E
Raw boundary mark	60	54	48	42	36	31	26
Points Score	14	12	10	8	6	4	2

Level 3 Unit 3 Selection and Application of Engineering Materials

	Max. Mark	A*	A	B	C	D	E
Raw boundary mark	60	54	48	42	36	30	24
Points Score	14	12	10	8	6	4	2

Level 3 Unit 6 Investigating Modern Manufacturing Techniques used in Engineering

	Max. Mark	A*	A	B	C	D	E
Raw boundary mark	60	54	48	42	36	30	24
Points Score	14	12	10	8	6	4	2

Level 3 Unit 7 Innovative Design and Enterprise

	Max. Mark	A*	A	B	C	D	E
Raw boundary mark	60	54	48	42	36	30	25
Points Score	14	12	10	8	6	4	2

Level 3 Unit 8 Mathematical Techniques and Applications for Engineers

	Max. Mark	A*	A	B	C	D	E
Raw boundary mark	60	53	47	41	35	29	24
Points Score	14	12	10	8	6	4	2

Level 3 Unit 9 Principles and Application of Engineering Science

	Max. Mark	A*	A	B	C	D	E
Raw boundary mark	60	53	47	41	35	29	23
Points Score	21	18	15	12	9	6	3

Notes

Centres are reminded that this is the first summer examination for this new specification and that boundaries may change in the following series

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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