Level 1 / Level 2 Examiners' Report

Engineering (Technical Award)

Level 1 / 2

January 2025

Introduction

Our Principal Examiners' report provides valuable feedback on the recent assessment series. It has been written by our Principal Examiners and Principal Moderators after the completion of marking and moderation, and details how candidates have performed in each unit.

This report opens with a summary of candidates' performance, including the assessment objectives / skills / topics / themes being tested, and highlights the characteristics of successful performance and where performance could be improved. It then looks in detail at each unit, pinpointing aspects that proved challenging to some candidates and suggesting some reasons as to why that might be.[1]

The information found in this report provides valuable insight for practitioners to support their teaching and learning activity. We would also encourage practitioners to share this document – in its entirety or in part – with their learners to help with exam preparation, to understand how to avoid pitfalls and to add to their revision toolbox.

Further support

Document	Description	Link
Professional Learning / CPD	WJEC offers an extensive programme of online and face-to-face Professional Learning events. Access interactive feedback, review example candidate responses, gain practical ideas for the classroom and put questions to our dedicated team by registering for one of our events here.	https://www.wjec.co.uk/home/professional-learning/
Past papers	Access the bank of past papers for this qualification, including the most recent assessments. Please note that we do not make past papers available on the public website until 12 months after the examination.	Portal by WJEC or on the WJEC subject page
Grade boundary information	Grade boundaries are the minimum number of marks needed to achieve each grade. For unitised specifications grade boundaries are expressed on a Uniform Mark Scale (UMS). UMS grade boundaries remain the same every year as the range of UMS mark percentages allocated to a particular grade does not change. UMS grade boundaries are published at overall subject and unit level. For linear specifications, a single grade is awarded for the subject, rather than for each unit that contributes towards the overall grade. Grade boundaries are published on results day.	For unitised specifications click here: Results, Grade Boundaries and PRS (wjec.co.uk)

[1] ***Please note that where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report.***

Exam Results Analysis	WJEC provides information to examination centres via the WJEC Portal. This is restricted to centre staff only. Access is granted to centre staff by the Examinations Officer at the centre.	Portal by WJEC
Classroom Resources	Access our extensive range of FREE classroom resources, including blended learning materials, exam walk-throughs and knowledge organisers to support teaching and learning.	https://resources.wjec.co.uk/
Bank of Professional Learning materials	Access our bank of Professional Learning materials from previous events from our secure website and additional pre-recorded materials available in the public domain.	Portal by WJEC or on the WJEC subject page.
Become an examiner with WJEC	We are always looking to recruit new examiners or moderators. These opportunities can provide you with valuable insight into the assessment process, enhance your skill set, increase your understanding of your subject, and inform your teaching.	Become an Examiner | WJEC

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Executive Summary

Overview

This report analyses the Winter 2025 assessment series for the Level 1/2 Engineering (Technical Award) across Unit 1: Manufacturing Engineering Products, Unit 2: Designing Engineering Products, and Unit 3: Solving Engineering Problems.

Candidates demonstrated strong practical skills, digital proficiency, and structured problem-solving, with improvements in planning, evaluation, and technical drawings. However, challenges remain in technical terminology, material properties, and drawing conventions.

While digital portfolios enhanced presentation, over-reliance on templates and CAD/CAM tools limited independent decision-making and traditional hand skills. Greater focus on annotation, design justification, and evaluation depth is needed to raise standards.

Unit 1: Manufacturing Engineering Products

Unit 1 showed improved component quality and better planning through sequencing tools such as Gantt charts. However, risk assessments were often too generic.

While many candidates produced high-quality outcomes, limited use of traditional methods and processes hindered fundamental engineering skills development. Stronger candidates demonstrated a clearer understanding of tolerances, specifications, and areas for improvement.

Unit 2: Designing Engineering Products

Digital portfolios improved presentation flexibility; however excessive use of templates restricted independent design choices. Sketching and CAD modelling has improved, however annotation was often insufficient, and orthographic projections frequently lacked key details.
Production planning varied, with some candidates providing strong material and process justifications, while others relied on generic, surface-level responses. Mathematical applications improved, however incomplete working steps and missing units of measure reduced clarity.

Unit 3: Solving Engineering Problems

Candidates performed well in Health & Safety and interpreting engineering drawings, however technical terminology, material identification, and precision measurement skills need improvement. Many responses lacked specificity, with vague terms such as "steel" instead of specifying mild or carbon steel.

Errors in engineering drawing conventions were common, with candidates frequently misapplying line types, dimensions, and symbols. The accuracy of hand-drawn technical work varied, suggesting a need for stronger foundational skills in traditional hand drawing techniques, which may be influenced by a greater focus on using CAD. Written responses were generally well-reasoned, particularly in renewable energy discussions, though many candidates repeated the same benefits across different sources, limiting the depth of their analysis.

Final Points

This series showed continued improvement in practical skills, digital competency, and structured problem-solving. However, critical evaluation, technical terminology, and drawing accuracy require further development. Centres should encourage greater independent work and reduced template reliance to better prepare future candidates.

Areas for improvement	**Classroom resources**	**Brief description of resource**
Interpreting engineering drawings.	Chapter 2 – Companion book. Previous series Unit 1 task drawings.	A companion book produced by WJEC to support the delivery of this qualification. Previous series drawings can be used to practice interpretation.
Creating Health and Safety risk assessments	Access to the HSE website	Information available to support learning of risk assessments with examples.
Evaluating against engineering criteria – Measurement and tolerances.	Chapter 2 – Companion book	A companion book produced by WJEC to support the delivery of this qualification.
Engineering drawing conventions	Chapter 2 – Companion book Previous series Unit 1 task drawings	A companion book produced by WJEC to support the delivery of this qualification. Previous series drawings can be used to learn applied conventions.
Exam question interpretation	Previous series exams Page 15 – onwards of the unit 3 delivery guide	Previous series exams to practice interpretation. A guide to developing own questions and papers to practice interpretation.
Understanding of material properties and testing	Chapter 2 – Companion book	A companion book produced by WJEC to support the delivery of this qualification.

LEVEL 1 / 2 ENGINEERING (TECHNICAL AWARD)

Level 1 / Level 2

January 2025

UNIT 1 – MANUFACTURING ENGINEERING PRODUCTS

Overview of the Unit

This winter series saw many noteworthy submissions. Centres have continued to challenge candidates to produce commendable work. Numerous submissions stood out for their quality and attention to detail, showcasing the candidates' ability to analyse, plan, manufacture and evaluate within the given timeframes. This report is intended to assist new centres whilst also providing guidance to those that have already undertaken the qualification.

Unit 1 comprises of three Assessment Objectives which are applied throughout the range of tasks linked to the unit.

AO1 requires candidates to demonstrate knowledge and understanding from across the specification.

AO2 focuses on the application of skills knowledge and understanding in a variety of contexts and in the planning and carrying out of investigations and tasks. This AO also includes the application of practical skills.

AO3 requires candidates to analyse and evaluate information whilst making reasoned judgments and presenting their conclusions.

The combined weighting of the three Assessment Objectives in Unit 1 contribute to 40% of the overall qualification.

Unit 1 focuses on the production of engineered products. Through a range of topics, candidates are expected to:

- Understand Engineering Drawings (1.1) through the interpretation of the provided technical details and data packs found within the candidate packs.

- Plan operations (1.2) by identifying appropriate materials, tools, settings, and equipment and then planning and sequencing the production whilst considering contingencies for a range of potential problems or unforeseen events.

- Use engineering tools and equipment (1.3) to produce the engineered product using the details and data from the given engineering drawings. Candidates must also undertake relevant risk assessment of their processes and environment linked to the tasks they are completing.

- Implement engineering processes (1.4) work in a safe manner whilst applying appropriate Health and Safety practices whilst undertaking practical tasks. Candidates are also expected to use a variety of suitable materials before finally evaluating their own practices and processes.

General overview of the performance across the unit.

Most submissions this series were digital, with candidates presenting their work to a professional standard. However, there was an overreliance on the use of centre-provided templates, which restricted candidates' opportunities to decide upon the layout. This practice goes against instructions for controlled assessments and hinders candidates from being able to present information in a way that best suits their strengths. Additionally, some candidates opted to submit handwritten work which was subsequently scanned.

In this series, some photographic evidence lacked the necessary detail. High-quality photographs aid the moderation process by ensuring that the work is accurately assessed and moderated. Photographic evidence is required for all submissions and should clearly demonstrate features of interest. Photos should consist of separate component parts as well as assembled parts to provide a comprehensive view of the candidates' work.

Evidence from many centres indicates that assessors and candidates have developed a clear understanding of the unit's expectations, as demonstrated by the advanced skills displayed across many of the Unit 1 portfolios.

While numerous high-quality submissions were moderated, there are still opportunities for centres to further refine and enhance their submissions.

How the assessment compares with previous series

In comparison to previous series, there has been a noticeable increase in candidates annotating directly onto their technical drawings. This improvement highlights that many candidates had ample opportunities to logically think through their decision-making processes. Additionally, candidates were given these opportunities prior to commencing production, which has positively impacted the quality of their submissions.

There has been a marked increase in centres submitting portfolios where the outcomes heavily rely on Computer-Aided Design (CAD) and Computer-Aided Manufacturing (CAM). While these technologies provide many advantages, there is the potential for this trend to limit candidates' opportunities to demonstrate traditional engineering skills. By overemphasising CAD / CAM, candidates may miss developing and showcasing fundamental hand and machining skills that are critical to their overall competency and proficiency in this qualification.

Despite being a smaller examination series, it was pleasing to observe that many centres have incorporated key messages delivered through CPD sessions, as well as direct feedback provided via previous moderation reports.

Comments on individual questions / sections

Task 1(a) – (10 Marks)

AO1 (4 Marks)

Numerous candidates successfully showcased their ability to analyse technical drawings, with many illustrating inferring skills and summarising key information extracted from the drawings. However, a limited number of candidates are still only demonstrating an understanding of key symbols on technical drawings, rather than discussing the information and establishing links between parts and processes.

It is recommended that assessors conduct quality assurance checks before uploading submissions to ensure that scans or photographs of annotated work meet the required quality standards.

AO3 (6 Marks)

It was encouraging to observe that during this series, a greater number of candidates are being challenged to read and interpret key information using the provided data packs. Candidates who achieved greater outcomes successfully extracted critical details such as tap and thread sizes, as well as centre lathe spindle speeds, plus applied this data to their situation via annotation.

Several submissions showed promising analytical skills, though there is still potential for development.

Task 1(b) – AO1 (4 Marks)

For most submissions, there was a commendable standard of knowledge of how to present information extracted from the technical drawings. Digital submissions contributed to this improvement; however, candidates who achieved higher marks frequently made effective use of annotations. Additionally, they often used blended approaches that combined handwritten responses with digitally produced work.

In certain instances, evidence showed that centres were providing templates and specifying the content to be included. Such guidance may result in candidates receiving undeserved marks due to the support provided, without adequately demonstrating their own skills.

It was encouraging to see a variety of presentation methods. Some centres asked candidates to produce their own technical drawings to fully illustrate their understanding, while others had candidates create 3D virtual CAD models. The awarding of marks is determined by the quality of content and how it is evidenced in candidates' portfolios, with no single method holding more weight when assessing Task 1(b).

Task 2(a) – AO2 (10 Marks)

This task demonstrated ongoing progress, with an increasing number of candidates addressing all aspects of the mark scheme across various assessment bands. The identification of stock and stock sizes was clear in a substantial number of samples reviewed during moderation.

There was evidence of candidates conducting independent research when selecting stock forms. They subsequently documented and reviewed their research plus determined the most suitable choice. When candidates had greater freedom in selecting materials for production, their work was more in-depth and varied.

Materials, tools, and equipment were often identified in detail, demonstrating candidates' clear understanding of their use. However, many comments remained generic. It is recommended that candidates link tools and equipment to their specific purposes within the project and discuss how they can be utilised to achieve the required process.

Task 2(b) – AO2 (10 marks)

Planning was consistently robust in both layout and content. Many candidates produced detailed plans that were overly reliant on the use of tables, which are restrictive when writing plans. Stronger candidates included key details in their plans such as machine spindle speeds, cutting lists, and detailed steps which were clear and concise.

Contingency planning remains an area of ongoing improvement. While many candidates included contingencies, their statements were often generic and primarily focused on key workshop equipment. In contrast, higher-quality contingency planning was tailored to the specific part being planned, demonstrating a deeper understanding of the component and its requirements.

It was encouraging to see that candidates are considering timings when planning. In this series, this information was consistently supported by Gantt charts. Some candidates also included an overall time plan with contingency planning. It is important that candidates compose sequential detailed time plans which can be taken into workshop spaces to assist the manufacturing process.

Task 2(c) – AO3 (6 marks)

The assessment of potential risks remains an area that centres need to further develop. While many candidates completed formal risk assessments, they need to focus more on the specific operations being performed. It is evident that many centres are delivering this content during standalone lessons rather than incorporating it into the delivery of the project. Candidates could discuss which issues they may potentially face whilst drilling a specific component on the pillar drill and elaborate to state how to mitigate the risk, rather than completing a generic risk assessment on a pillar drill.

Task 3 – AO2 (16 marks)

In this series, centres should be commended for how candidates, in many cases, produced high-quality outcomes that were within acceptable tolerances and closely resembled the candidate pack drawings. Candidates completed their projects using a variety of relevant materials. It is reminded that candidates should be given the opportunity to select suitable materials to produce their outcomes. However, there was little diversification shown by centres, with full cohorts often using the same materials for component parts, resulting in limited variety in the final assemblies.

Centres should avoid excessive reliance on CAD / CAM. Although, these methods aid the overall final quality by directing candidates to use these manufacturing techniques, it restricts their ability to showcase their practical skills and justify their marks.

Assessor comments on both mark sheets and witness statements were informative and effectively supported the moderation process. This was a notable strength in this series.

As previously mentioned, the quality of photographs in submissions is crucial for moderating this section. High-quality photos help substantiate assessors' comments when evaluating the quality of the finish.

Task 4(a) – AO2 (12 Marks)

A wide range of engineering skills were demonstrated by candidates across the work in this series. Many candidates were clearly challenged to produce high-standard components. Similar to Task 3, a consistent strength was the detailed observations and comments provided in the mark sheets.

Candidates should aim to fully demonstrate a wide range of skills using a variety of materials by completing the practical tasks. Aiming to produce all component parts to a high standard without over-replicating skills. This approach will allow them to showcase their capabilities while utilising different materials and stock forms. Where candidates have been unable to manage their time effectively, this should be reflected in their allocation of marks. To access top marking descriptors, candidates should exhibit a wide range of processes with a high level of developed skills, using a diverse array of wholly appropriate materials.

Candidates should be encouraged by centres to make their own selection from a range of materials made available to them. This should ensure a diverse range of submissions from centres which fully meets the requirements of the specification. It also allows better opportunities for candidates to justify their selections earlier in the unit and will increase knowledge and understanding of materials in preparation for undertaking Unit 2.

When awarding marks in Task 4a, assessors should be mindful of the range of skills demonstrated, especially when candidates rely heavily on CAD / CAM processes.

Task 4(b) – AO3 (12 Marks)

Task 4(b) continues to be an area for improvement for many centres. It is vital that candidates are critical when writing their evaluations.

This series saw some candidates creating a journal of production, which does not fulfil the marking descriptors. Evaluations need to be reflective pieces of work where candidates critically review their own practices and processes against the outlined information provided in the drawings and specifications. Assessors need to ensure that candidates are familiar with the requirements of this task.

Candidates who composed excellent responses commonly included the use of measurements and tolerances in their evaluations, supported by photographic evidence and strong annotation, while discussing how they met their tolerances and specifications. High-quality evaluations commonly included reviews of their planning and understanding of technical drawings.

When candidates are critical in their reviews, it can lead to meaningful and justified suggestions for improvements.

Summary of the unit

This series saw many centres submit high-quality work. It is encouraging that messages delivered through CPD, and moderation reports are being acted upon, increasing the overall quality of assessment and the work assessed.

LEVEL 1 / 2 ENGINEERING (TECHNICAL AWARD)

Level 1 / Level 2

January 2025

UNIT 2 – DESIGNING ENGINEERING PRODUCTS

Overview of the Unit

This series has seen an increase in the number of candidates entered for this unit, which allows the report to cover a wider range of work than in previous winter series.

Unit 2 also implements the three Assessment Objectives which are applied throughout the range of tasks linked to the unit. These are:

AO1 requires candidates to demonstrate knowledge and understanding from across the specification.

AO2 focuses on the application of skills knowledge and understanding in a variety of contexts and in the planning and carrying out of investigations and tasks. This AO also includes the application of practical skills.

AO3 requires candidates to analyse and evaluate information whilst making reasoned judgments and present their conclusions.

The combined weighting of the three AOs in Unit 2 contribute to 20% of the overall qualification.

Unit 2 allows candidates to experience and gain understanding of how an engineering product is adapted and improved over time. Candidates will respond to a given brief which requires adaptions or improvements of the product which was produced in Unit 1. Through a range of tasks, candidates will focus on the following topics and be expected to:

Understand function and meet requirements (2.1) by identifying primary features of the given product, identifying products which have similar features and finally explaining the functional requirements of their own design solutions.

Propose Design Solutions (2.2) by generating a range of solutions and then developing them through to a conclusion. Candidates should use appropriate methods to communicate their design ideas.

Communicate an engineering design solution (2.3) through a developed engineering specification and a range of engineering drawings that adheres to recognised standards.

Solve applied engineering problems (2.4) by applying mathematical techniques to clarify or solve problems, specify suitable materials for use in their final engineered solution and suggest appropriate methods for producing the component parts of their final design.

General overview of the performance across the unit

This series has seen a clear improvement in the range of presentations adopted by candidates to present their work. Every centre opted to use digital portfolios which allows candidates to develop their own style of presentation. However, if templates are provided by the centre, it limits the accessibility to the mark scheme as the candidate is considered to have been led by the centre.

Assessment of the unit was generally well done however there are a number of tasks which were consistently generously marked. These will be detailed in the task breakdown below.

Sketch work of ideas has improved, but there is often still a lack of detail in the annotation to explain how the engineered product functions. 3D models were used by a large number of candidates this series which allowed access to the higher mark bands as they were able to further explain the design solutions undertaken by the candidates. A large number of candidates supplemented sketches with additional CAD outcomes which aided in explaining the detail in their concepts.

Assessors tended to be generous in the marking of engineering drawings this series and there needs to be better familiarisation with both the mark scheme bands and the application of conventions. Again, there were numerous orthographic CAD and traditional drawings seen in the series. These were often lacking in detailed dimensions and other key areas described later in the report.

Assessors also tended to be generous in the marking of the production plans to manufacture the product. High marks were awarded for a small number of steps, usually lacking in detail.

Comments on individual questions / sections

Task 1a(i) – AO2 (2 Marks)

Candidates performed well in this task showing clear understanding of the individual functions of the primary features of the product linked to the brief.

Candidates continue to show that they could make connections between the product in Unit 1 and the required additions of the brief in Unit 2. Portfolios showed clear evidence of candidates making connections between how the modifications would interrelate with the prototype. This is an area which should be developed by all centres as the Unit 2 should not be undertaken in complete isolation from Unit 1. It is strongly advisable that candidates take the information from the Unit 1 engineering drawings as a basic starting point to designing the modified prototype. Addressing the task in this way allowed fuller access to the mark scheme.

Task 1a(ii) – AO2 (2 Marks)

Most candidates performed well in this task by suggesting other engineered products that had similar functional properties to those required by the given brief. Products selected were appropriate and learners clearly understood the connections between these products and those modifications required in the brief.

Task 1b – AO3 (5 Marks)

Candidates were clearly able to justify their selections and clearly link where their selected choices could be used in their own design process. It was clear from the evidence seen that these choices were integrated into their solutions, by allowing realistic outcomes as which assisted candidates in meeting the brief. Those outcomes which addressed the higher mark band fully justified their decisions by explaining both the reason for selecting the products and where they could be applied to the required modifications outlined in the brief.

Task 2(a) – AO2 (4 marks)

Sketching of concepts is improving and, in many cases, this is supported by CAD drawings showing 3D views of the product and component parts. Candidates mostly show a good range of ideas which are individual and link to the above tasks.

Many candidates include pictorial information from task 1a(ii) to reinforce links between their selected existing engineered products and the design outcomes they were developing. An area that centres should review is the quality of the sketching that appears in the portfolio. In a small number of portfolios, the sketching does not fully convey the thoughts of the candidate, making it difficult to understand their ideas.

The range of modelling continues to improve for this unit. CAD models were used as illustrative models to show the overall look and finish of the prototype however, a larger number of candidates displayed physical models using card, foam, and a range of other materials, to clearly show the details of how their product functioned.

Assessors should ensure they are familiar with the assessment requirements for this task as the use of modelling appears in each of the mark ranges.

Task 2(b) – AO3 (4 marks)

Evaluations of how the candidates designs met the brief and specification were again mixed when looking across the series.

There were a number of high-level responses where evidence showed a clear understanding of candidates evaluating their design proposals fully against the set criteria within the brief and specifications. These were often scored or ranked using a variety of methods to determine the most suitable outcome to progress onwards to the next stages. There was also a great deal of evidence where responses relied on using the ACCESS FM method to evaluate the proposals however, many of these contained superficial or generic outcomes which limited the candidates' responses to the task. To avoid this, candidates should try and evaluate their work from an engineering perspective.

Centres and assessors need to ensure that evidence for this task focuses on the given criteria from the brief and specification. These need to detail how the outcomes have addressed the problem for each proposal whilst still dealing with the key areas of materials, sizes, tolerances, cost, and operational parameters in a focused way, avoiding generic statements which often had little justifications to address the task requirements.

Task 2(c) – AO2 (4 marks)

A wide variety of CAD drawings were used to present design ideas alongside traditional sketching and drawing techniques in this section. Annotation in this task was still weak, however there were a number of candidates who included an excellent level of detail to clarify their designs which was written using a range of effective and precise terminology.

To meet the upper mark range, outcomes need to clearly explain the details of the design, discuss function and technical details such as how something is locked in place, the use of countersinking parts plus the justification for its use as well as suggest materials and finishes.

The general layouts of presentations were well done although a small number of centres are still using templates for their candidates, again, this should be avoided as the specification requires the work presented to be unique in nature.

Task 3(a) – AO2 (6 marks)

Much of the evidence seen for this task continues to show that candidates had a good understanding of basic orthographic drawings and of isometric drawings and sketches to support their design solutions. Assessors need to ensure familiarity with the requirements of band 3 where the mark scheme clearly states ‘a highly detailed range of dimensions’. This once again was often the main area of error in the awarding of marks as well as a lack of conventions such as hidden detail and centre lines.

To consider a response for the upper mark band, the evidence should effectively include dimensions for all component parts which could then be passed onto a third party to manufacture from the details provided.

Familiarisation of conventions is also important for the knowledge and understanding required by candidates to complete the Unit 3 examination unit.

Task 3(b) – AO1 (3 marks)

There was a mixed response to this task during the series with evidence of specifications being created but often not fully meeting the mark scheme requirements. There was again a heavy use of ACCESS FM to fulfil the task requirements but, this system does not lend itself well to producing the evidence requirements of the task. Many of the statements seen in responses were generic and lacked the precise details required for a specification.

Where candidates had addressed this task well, there was evidence of technical details, material information and finishing details. This was a clear strength in some centres.

As stated in the specification, these details would be required before a third party commences manufacturing. Many examples seen during the moderation process presented simple plans for manufacturing, often incomplete, and still awarded high marks.

Task 4(a) – AO2 (4 marks)

There was an increase in the number of candidates who performed well in this task where the evidence showed how they had applied relative mathematical techniques to determine a specific problem from the brief.

Common outcomes were seen where candidates had calculated volumes for removal or generated detail costings from stock sizes and component prices before calculating the unit price for one complete prototype.

As in the summer series, there was some generous marking seen in this task where candidates had only applied limited calculations or provided an answer only yet been marked at the top end of the mark scheme. To achieve the higher mark, candidates must show the calculations, correct answer, and appropriate units.

Task 4(b) – AO3 (6 marks)

The final task requires candidates to produce a detailed outcome to allow the prototype to be produced by a third party. There was a clear improvement in this task this series but as mentioned earlier in the report, there are some centres and candidates which are confusing this outcome and the specification task (3b).

Successful outcomes showed a clear plan for manufacturing the component parts of the candidates' final design outcome, supported with details about material removal and shaping, methods of joining components using a range of methods, details of bought in component parts such as bolts and washers. These were often justified and in the higher band responses, candidates had clearly applied skills developed in the unit 1 task and applied these thoroughly in this area of the unit.

Conclusion

This unit is continuing to develop well across centres and the quality of evidence seen has improved in detail since the summer series. Centres should focus on the areas mentioned in the report to fine tune the delivery of the specification and ensure that assessors are familiar with the task outcomes and mark scheme where some element of generous marking has been identified.

The course continues to grow from strength to strength and it is rewarding to be able to see the many examples of high-quality outcomes across both units.

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Level 1 / Level 2

January 2025

UNIT 3 – SOLVING ENGINEERING PROBLEMS

Overview of the Unit

The paper was mostly attempted by all candidates. It is still noticeable that a significant minority of candidates are overlooking key aspects of the questions. Health and Safety and extracting information from engineering drawings skills were particularly strong. Areas for further development are the use of engineering specific technical language and moving away from the 'known as' responses that still frequently appear.

Comments on individual questions / sections

Question 1(a)

(i) The majority of candidates named generic material such as steel but as in previous series the mark scheme calls for a specific material such as mild-steel / medium-carbon steel **(1 Mark)**.

(ii) Most candidates were able to respond well to this question. Popular responses referred to prevention of corrosion and improving the aesthetics of the track. Often responses were not explained or justified **(2 Marks)**.

(iii) This question was not answered very well. Candidates often referred to corrosion resistance and often repeated the question. The properties described needed to refer to the properties of fabricating the tracks not the track material itself **(4 Marks)**.

(iv) This question was attempted by most candidates. The majority were able to identify at least one correct material however a significant minority still refer to generic terms such as 'steel' or 'plastic' **(2 Marks)**.

(v) This question was well attempted by most candidates. Candidates have clearly drawn on their experiences with CAD and were able to describe the advantages **(3 Marks)**.

(vi) Most candidates were able to achieve at least one mark on this question. Candidates often gave a definition of either a NDT or DT, some referred to one test that could be applied with few either giving two points or giving full justification **(2 Marks)**.

Question 1(b)

(i) Most candidates were able to identify a suitable threaded solution for the first section of the question. The second part was less well answered. Candidates often repeated answers but most were aware that the joining method made assemble / disassembly more straight forward **(3 Marks)**.

(ii) Most candidates were able to identify a suitable permanent fixing method with welding being the overwhelming choice. The advantages for this question were varied but were related to strength and longevity of the joint **(3 Marks)**.

Question 2(a)

(i) A very well answered question. Responses for this question show candidates know how to conduct themselves on this piece of equipment **(2 Marks)**.

(ii) This question was reasonably well attempted. Most candidates were able to identify at least two safety precautions. The most common was to *"never to screw towards the user"* and *"always select the correct screwdriver for the screw to avoid slipping*" **(3 Marks)**.

(iii) This question was attempted by most candidates. Most were able to correctly identify the slotted or flat head screwdriver however, the Phillips or pozi drive screwdriver was less well answered. The most common answer was cross head or star drive. The specification asks for the correct terminology to be used as opposed to 'known as' style responses **(2 Marks)**.

(iv) This question was not answered well by most candidates. Very few candidates were able to correctly name either calliper. The use of the calliper was also poorly answered. Neither calliper is used to measure any item. The internal calliper has no scale so cannot measure. The correct terminology must be used. The internal calliper is used to gauge, compare or check an internal diameter, similarly an odd leg calliper is used to mark or gauge not measure **(4 Marks)**.

Question 2(b)

(i) Most candidates attempted this question. The question asks for correct process to manufacture the part. Large numbers of candidates named the tools and not the process such as 'pillar drill' rather than 'drilling'. These processes should have been in sequential order however several candidates repeated the same step several times **(4 Marks)**.

(ii) Most candidates were able to draw the right-hand view in the correct place although they did not use adequate construction lines. Several responses were still not using a rule and the incorrect line type for features such as hidden detail and centre lines **(5 Marks)**.

(iii) This question was attempted by most candidates and the responses varied greatly. Most candidates were able to identify the diameter symbol and gave realistic uses. Very few candidates were able to correctly identify and give a use of the datum symbol **(4 Marks)**.

(iv) This question was answered well. Most candidates were able to identify at least two items that would commonly appear in a title block. This clearly shows candidates can use and extract information from engineering drawings **(3 Marks)**.

Question 3(a)

(i) This question was answered extremely well. Most candidates were able to read the different types of graphs and extract the relevant information **(4 Marks)**.

(ii) Most candidates were able to calculate the ratios and express them in the correct form. A significant number of candidates gained the calculation marks but expressed the answer in the incorrect form **(6 Marks)**.

Question 3(b)

(i) This question was not answered well by most candidates. There were errors in the identification of correct properties. The mark scheme was looking for mechanical or physical properties of a material, therefore answers like 'grippy' were not accepted. Candidates performed better when they needed to explain the properties **(4 Marks)**.

(ii) This question was answered well by most candidates. Several candidates only gave either the maximum or minimum measurements. Spending time reading the question fully would have helped with this question **(6 Marks)**.

(iii) Most candidates attempted this question, but few scored full marks. Most were successful in reading the steel rule, whilst most lost marks on the vernier scale and micrometer suggesting they may not have used these measuring instruments in a workshop environment **(3 Marks)**.

Question 4

This question was answered well by most candidates. Most were able to identify a number of renewable energy sources and correctly identify positives and negatives. Several responses were quite repetitive, identifying two or three renewable energy sources then repeating the same benefits for all **(10 Marks)**.

Summary of key points

- Teaching of physical and mechanical properties of materials needs further development.
- The identification of the use of tools requires development particularly the difference between measure, marking and gauging.
- Longer written responses were attempted well and were generally well reasoned.
- The knowledge and use of drawing conventions still requires further development. A reliance on CAD to produce working drawings may be a factor but this may not support candidates in an examination setting.

Supporting you

Useful contacts and links

Our friendly subject team is on hand to support you between 8.30am and 5.00pm, Monday to Friday.

Tel: 029 2240 4307

Email: engineering@wjec.co.uk

Qualification webpage: Level 1 / 2 Vocational Award in Engineering (Technical Award)

See other useful contacts here: Useful Contacts | WJEC

CPD Training / Professional Learning

Access our popular, free online CPD / PL courses to receive exam feedback and put questions to our subject team, and attend one of our face-to-face events, focused on enhancing teaching and learning, providing practical classroom ideas, and developing understanding of marking and assessment.

Please find details for all our courses here: https://www.wjec.co.uk/home/professional-learning/

WJEC Qualifications

As Wales's largest awarding body, WJEC supports its education community by providing trusted bilingual qualifications, specialist support, and reliable assessment to schools and colleges across the country. This allows our learners to reach their full potential.

With more than 70 years' experience, we are also amongst the leading providers in both England and Northern Ireland.

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