

1145-21 Level 2 Certificate in Engineering (Manufacturing Technologies)

2023

Qualification Report

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Introduction

This document has been prepared by the Chief Examiner and Principal Moderator; it is designed to be used as a feedback tool for centres in order to enhance teaching and preparation for assessment. It is advised that this document is referred to when planning delivery and when preparing candidates for City & Guilds Technical assessments.

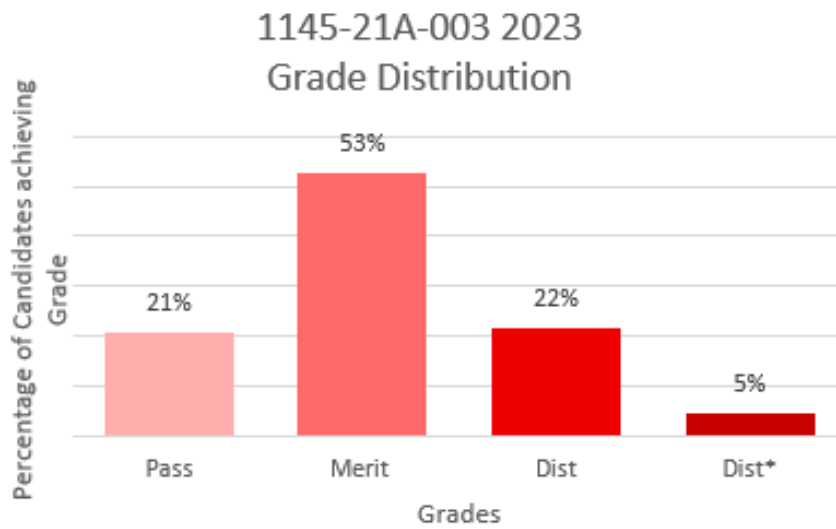
This report provides general commentary on candidate performance in both the synoptic assignment and theory exam. It highlights common themes in relation to the technical aspects explored within the assessment, giving areas of strengths and weakness demonstrated by the cohort of candidates who sat assessments in the 2022 academic year. It will explain aspects which caused difficulty and potentially why the difficulties arose.

The document provides commentary on the following assessments:

- 1145-520 - Level 2 Technical Certificate in Engineering (360) - Theory exam
 - March 2023 (Spring)
 - June 2023 (Summer)
- 1145-027 - Level 2 Technical Certificate in Engineering (Manufacturing Technologies) – Synoptic Assignment

Qualification Grade Distribution

The approximate grade distribution for this qualification is shown below:



Please note City & Guilds will only report qualification grades for candidates who have achieved all of the required assessment components, including Employer Involvement, optional units and any other centre assessed components as indicated within the Qualification Handbook. The grade distribution shown above could include performance from previous years.

Theory Exam

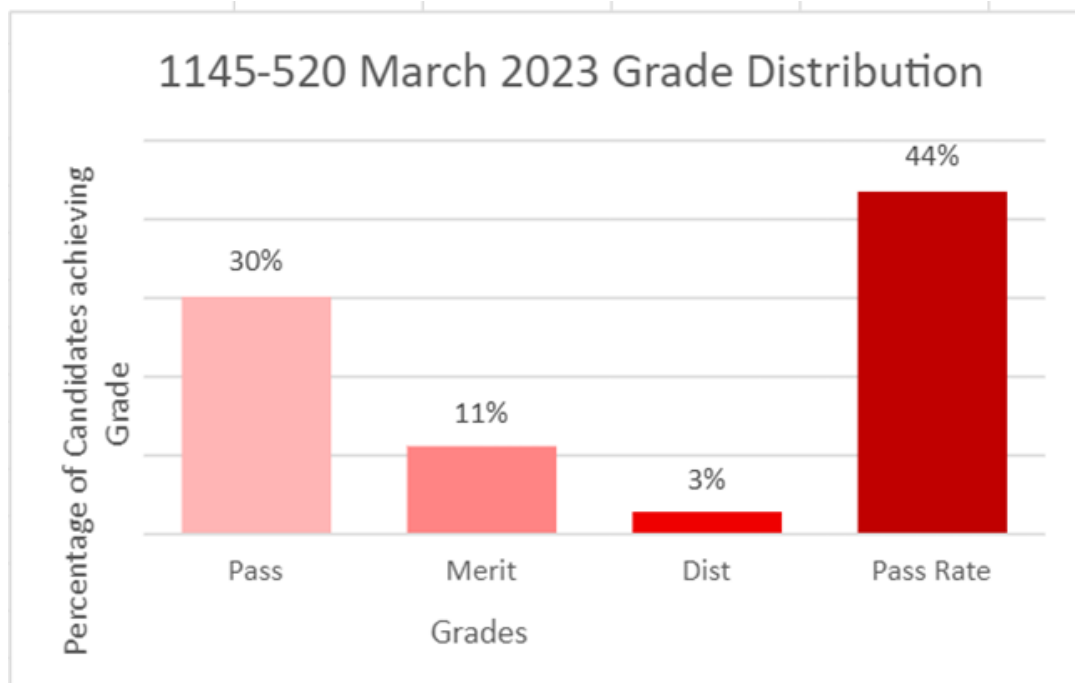
Grade Boundaries

Assessment: **1145-520 Level 2 Engineering – Theory exam**
Series: **March 2023**

Below identifies the final grade boundaries for this assessment, as agreed by the awarding panel:

Total marks available	60
Pass mark	22
Merit mark	31
Distinction mark	41

The graph below shows the approximate distributions of grades and pass rate for this assessment using the above boundary marks:

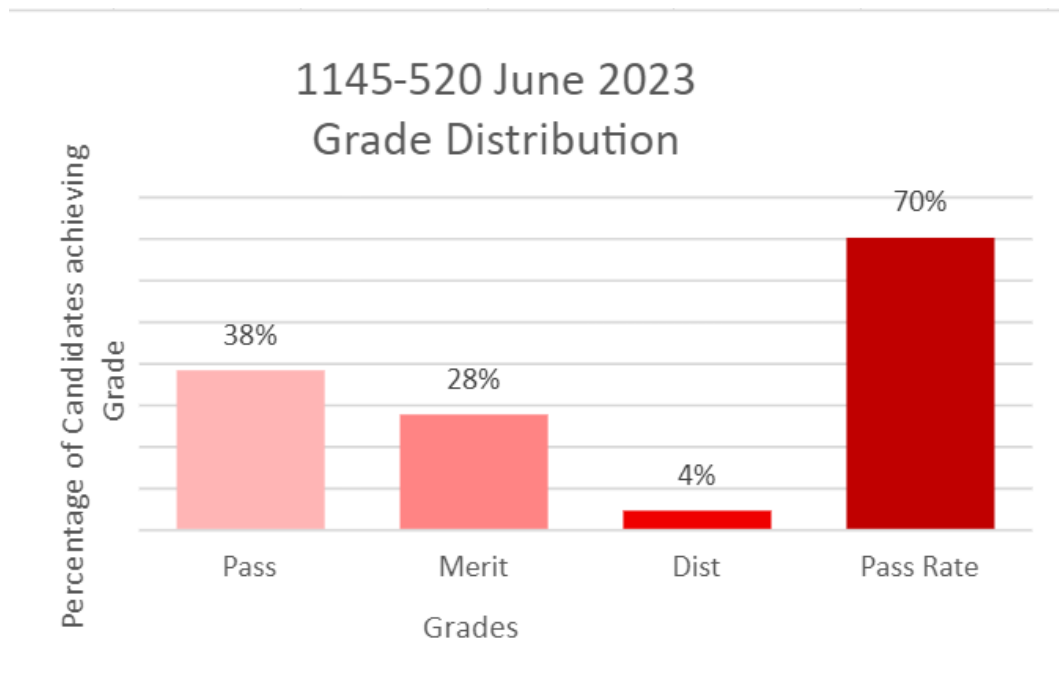


Assessment: **1145-520 Level 2 Engineering – Theory exam**
Series: **June 2023**

Below identifies the final grade boundaries for this assessment.

Total marks available	60
Pass mark	22
Merit mark	31
Distinction mark	41

The graph below shows the approximate distributions of grades and pass rate for this assessment using the above boundary marks:



Chief Examiner Commentary

Assessment component: 1145-520 Level 2 Engineering – Theory exam

Series 1 – March 2023

The paper as a whole and the individual questions met the requirements of the specification and were pitched appropriately for this level. The paper was comparable with the previous series in terms of the number of questions assessing knowledge recall, understanding and extended responses. There was a mixed response to this paper, with some areas of strength but many areas of weakness demonstrated throughout the cohort. Cohort performance showed a decline in achievement rate compared to previous series.

Candidates generally performed well in questions relating to some aspects of health and safety, tolerances, selection of materials, types of communication and calculation of area. Candidates performed slightly better in areas such as the fundamental Maths concept of Pi, Engineering equipment and electrical component identification.

Areas where there were significant and consistent weaknesses shown included drawing symbol recognition, business improvement techniques, heat treatment processes, scientific definitions and unit conversions.

There was a mixed response to questions assessing basic knowledge recall (AO1). In questions assessing further understanding (AO2) candidates sometimes gave basic points of knowledge, but often did not extend these sufficiently to score the higher marks. In the question covering named materials, most candidates were able to select an appropriate material for the application and give valid reasons, but a significant number did not attempt the manufacturing part of the question or listed inappropriate production methods.

Maths questions were generally not answered well, although most candidates did score well on the question which required them to calculate the area of a shape. A number of candidates lost marks due to not showing all of their working, despite this being specifically asked for in each question. Candidates should be reminded to show all working, to ensure they can gain the maximum marks.

Candidates often struggled to recall basic technical facts, such as the meaning of Geometric Dimensioning and Tolerancing (GDT) and electrical symbols. Questions on GDT and electrical symbols have been asked in previous series and relate to fundamental Engineering knowledge. Another area of weakness was in the application of basic tools, which continued a similar trend from the last series. Candidates should be given access to all tools and equipment types, to ensure they can identify them and understand their applications.

The extended response question produced a good spread of responses and acted as the main differentiator for the paper, although these were generally skewed more towards the lower and middle, rather than the higher band. Some candidates misinterpreted the question, giving unrelated general points about production processes instead of addressing the specific question asked. Most candidates would have benefitted from moving beyond a list of basic points and adding more discussion surrounding the relative impact of different factors in their responses.

Candidates will benefit from providing answers which go beyond basic listing points and go into greater depth for AO2 questions. Candidates need to carefully read the question and what is being asked of them and ensure that the answers they are providing are specifically relevant to the question. On maths questions, candidates should ensure that they show all of their workings, in order to access full marks.

Series 2 – June 2023

The paper as a whole and the individual questions met the requirements of the specification and were pitched appropriately for this level. The paper was comparable with the previous series in terms of the number of questions assessing knowledge recall, understanding and extended responses.

There was a fairly mixed response to this paper with some clear areas of strength shown and some clear areas of weakness also present. Most questions assessing basic knowledge recall were answered well. Responses to questions assessing understanding were more mixed, as these were more limited in breadth and depth. Candidates often gave some relevant facts or information, but sometimes did not extend their answers sufficiently to gain the higher marks.

There was a mixed response to the maths questions, but overall this was generally better than in the previous series. Most candidates were able to complete at least some of the area calculation required, and a good number of candidates scored full marks on calculations of voltage and output force. Candidates also generally performed well on questions assessing health and safety, selection of materials and questions relating to use of technical information to prepare for engineering. There was also some improvement on application of tools and equipment, material properties.

Candidates struggled with questions covering recall of electrical and mechanical symbols as well as questions on definitions of scientific principles. They also found the question on corrosion in materials challenging, perhaps as the focus on pitting in this assessment was new. When providing answers regarding business improvement techniques, candidates were often able to make a limited number of relevant points but their explanations lacked depth.

On the synoptic question covering selection of a material and manufacturing processes, most candidates selected an appropriate material and gave valid reasoning, but a significant number did not attempt the manufacturing part of the question.

The extended response question (ERQ) within the paper attracted a range of responses in terms of quality and spread of marks across the bandings, therefore making it a good differentiator within the paper. Most candidates would have benefitted from giving more depth of discussion in their responses on how business size affects business activity, and considering both direct and secondary implications, along with any conflicting effects.

Candidates will benefit from providing answers which go beyond basic listing points and go into greater depth for understanding questions.

Centres are reminded of the City & Guilds Technicals 'Exam Guides' available here
[Technicals in Engineering qualifications and training courses | City & Guilds \(cityandguilds.com\)](https://www.cityandguilds.com/Technical-Exam-Guides)

Synoptic Assignment

Grade Boundaries

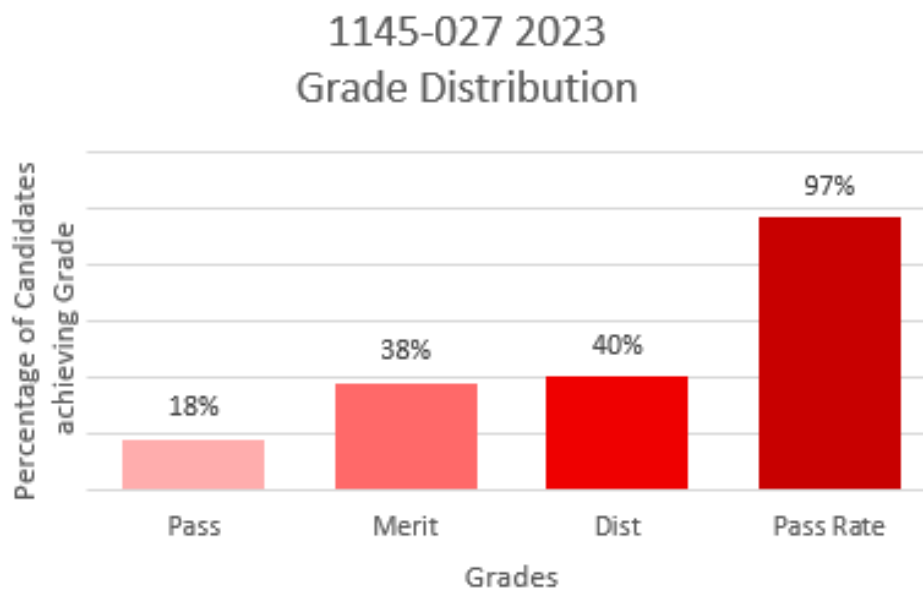
Assessment: 1145-027

Series: 2023

Below identifies the final grade boundaries for this assessment:

Total marks available	60
Pass mark	23
Merit mark	32
Distinction mark	42

The graph below shows the approximate distributions of grades and pass rate for this assessment using the above boundary marks:



Principal Moderator Commentary

Assessment component: 1145-027 Level 2 Engineering – Synoptic assignment

The assignment was comparable to the previous series. This view was reinforced by the evidence provided by the candidates, which was sufficient, valid and of appropriate quality to support marking and moderation.

The assignment involved the manufacture of a marking gauge using manual and computer-controlled machines. This was carried out as a series of structured tasks, specified in the assignment brief. The assessment objectives assessed by this assignment were AO1 (Recall of knowledge), AO2 (understanding), AO3 (practical skills), AO4 (bringing it together) and AO5 (attending to detail / perfecting). In general, this assignment was completed well by candidates.

AO1 (recall of knowledge) was generally well evidenced, with bills of material, production plans, risk assessments and evaluations of the manufacturing process all using appropriate technical terms. Most candidates demonstrated good knowledge recall, using the correct terminology for the tools and processes required.

AO2 (understanding) was generally well evidenced, particularly where candidates gave justifications for any working practices undertaken and safety requirements. The evidence provided by most candidates included risk assessments and production plans that implicitly demonstrated the practical application of understanding; in some cases, reasons were given for the processes selected, demonstrating best practice. However, some candidates missed the opportunity to provide supporting evidence for understanding by fully annotating and explaining their programmes for the CNC machining activities, to show clear understanding of the sequence of activities being carried out.

AO3 (practical skill) was appropriately evidenced, with pictures of the manufacturing processes in progress and supporting relevant commentary on the practical observation form. The best practice observed included pictures of the individual components, annotated with details of the manufacturing processes used.

AO4 (bringing it all together) was well evidenced, particularly in the production planning, justification of the processes used and the evaluation of components.

AO5 (attention to detail) was appropriately evidenced. Almost all candidates included test record sheets recording the main dimensions. The best identified practice was to include both test record sheets, with the results of objective dimensional measurements, and subjective evaluations of parts and the final assembly carried out by the candidates. These were supported by subjective comments by the tutor assessor on the practical observation form.

Overall, it was clear that markers had considered awarding marks across the full range of AOs in all tasks; this is to be commended. It would assist moderation if centres could make or add comments to illustrate where assessment criteria were being specifically addressed.