# 1145-32 Advanced Technical Extended Diploma in Engineering (720)

**2018**

## Qualification Report

# Contents

# 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 2018 academic year. It will explain aspects which caused difficulty and potentially why the difficulties arose.

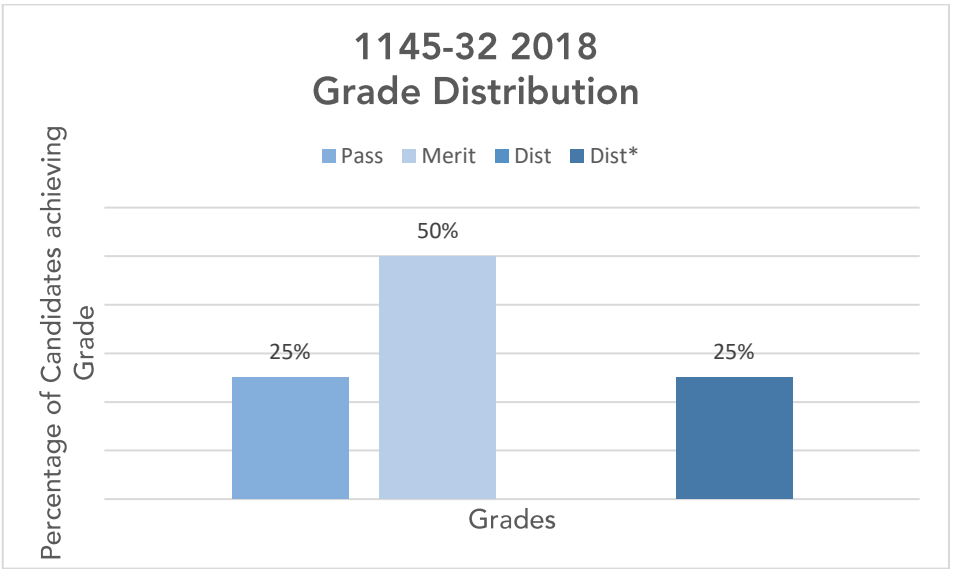
The document provides commentary on the following assessments:

- 1145-530 – Level 3 Engineering – Theory exam (1)
  - March 2018 (Spring)
  - June 2018 (Summer)
- 1145-532 – Level 3 Engineering – Theory exam (2)
  - March 2018 (Spring)
  - May 2018 (Summer)
- 1145-031 – Level 3 Engineering – Synoptic Assignment (1)
- 1145-034 – Level 3 Engineering – Synoptic Assignment (2)

# Qualification Grade Distribution

## 1145-32 Advanced Technical Extended Diploma in Engineering (720)

The 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 – Year 1

## 1145-530 – Level 3 Engineering (1)

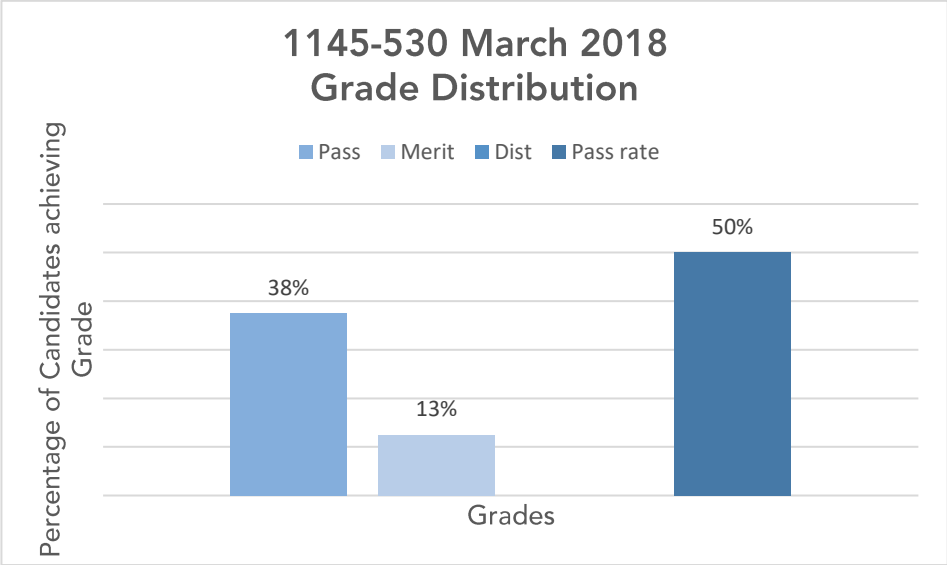
## Grade Boundaries

Assessment: 1145-530
Series: March/2018 (Spring)

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

| Total marks available | 100 |
|---|---|
| Pass mark | 31 |
| Merit mark | 48 |
| Distinction mark | 65 |

The graph below shows the distributions of grades and pass rate for this assessment:

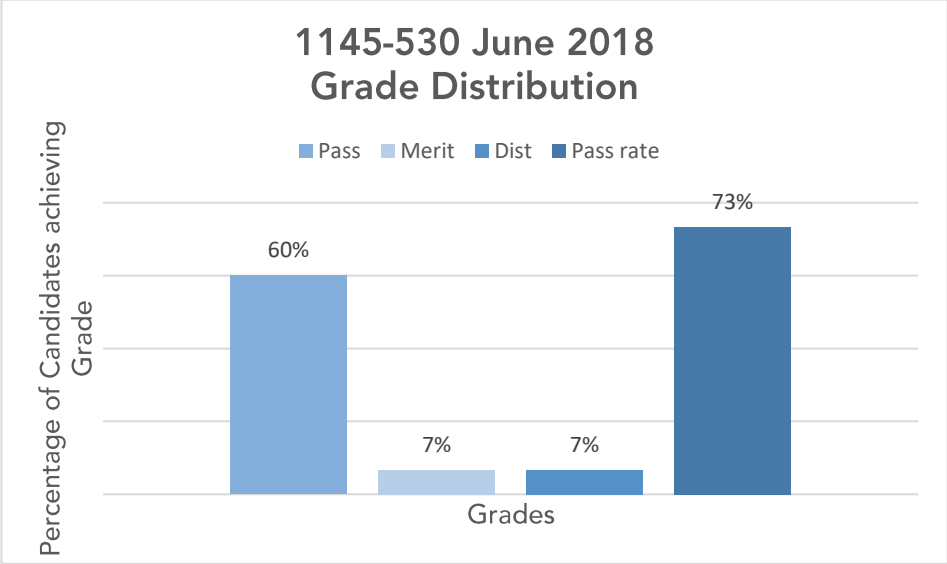


Assessment: 1145-530
Series: June/2018 (Summer)

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

| Total marks available | 100 |
|---|---|
| Pass mark | 40 |
| Merit mark | 55 |
| Distinction mark | 70 |

The graph below shows the distributions of grades and pass rate for this assessment:



# Chief Examiner Commentary

1145-530 – Level 3 Engineering - **Theory exam (1)**

**Series 1 – March 2018**

The questions and paper as a whole met the requirements of the specification and were pitched at an appropriate level. There has been significant revision in the content of the paper. The number of units covered has been reduced which means that for the remaining units, greater depth of knowledge is being tested. This has made the paper more challenging than previous iterations.

In general, this paper was not answered well by the candidates. A significant proportion of candidates left some questions blank or not attempted – in most cases the same questions, suggesting common areas of weakness (see individual questions comments).

In addition to the feedback on the specific questions below, some common themes were also noted, relating to heat treatment, maths questions and the synoptic questions:

Most candidates were not able to describe the stated heat treatment processes or their effects, typically referring to a single alternative process.

A substantial proportion of candidates did not attempt at least some of the maths questions. Of those who attempted them, these questions were typically not answered well Many candidates did not fully show their working and therefore missed out on marks.

Candidates generally gave weak responses to the synoptic questions. These questions clearly indicated that there was a broad range of candidate abilities. In many cases the responses lacked detail or did not consider the full breadth of the question, for example covering only one of social or economic impacts or only one scale of production. The candidate responses to these questions would also typically have benefited from planning or identifying the key points before attempting the question.

**Series 2 – June 2018**

The paper as a whole and the individual questions met the requirements of the specification, and were pitched appropriately for this level.

The cohort for this paper was only fifteen and it is therefore difficult to draw statistical conclusions regarding candidate performance. However, in general the paper was not well answered by candidates. There were several common areas of weakness shown, which are detailed further below.

Candidates generally showed good breadth and depth of knowledge when answering questions on health and safety (where candidates frequently expanded upon their responses) and the benefits of computer-based technologies, such as CAD and virtual modelling. However, significant gaps in knowledge and understanding were present in questions relating to quality, materials and any mathematical based questions. Only a low number of cases had questions left blank by candidates although one candidate had virtually no answers throughout the paper.

The synoptic question resulted in candidates generally showing a good breadth of basic knowledge but with limited depth of understanding and the ability to link the stem of the question (railways and mobile phones) to real benefits and developments. Answers were poorly structured with a lot of repetition that, I feel, was used to fill in space. All candidates would have benefited from producing more detailed supporting evaluations and conclusions to the points that were made.

In general, the answers provided lacked the depth of knowledge and understanding expected at level 3.

# Theory Exam – Year 2

## 1145-532 – Level 3 Engineering (2)

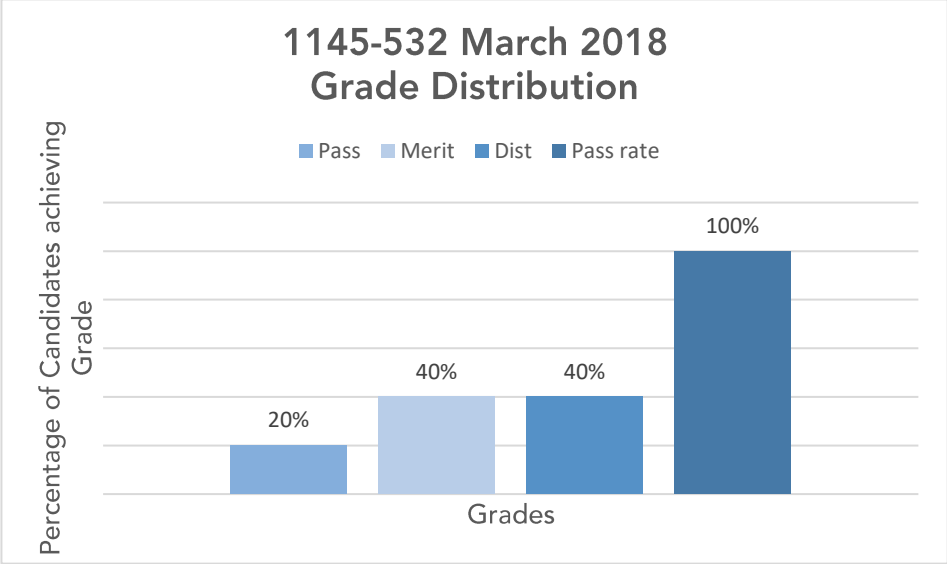
## Grade Boundaries

Assessment: 1145-532
Series: March/2018 (Spring)

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

| Total marks available | 60 |
|---|---|
| Pass mark | 21 |
| Merit mark | 31 |
| Distinction mark | 41 |

The graph below shows the distributions of grades and pass rate for this assessment:

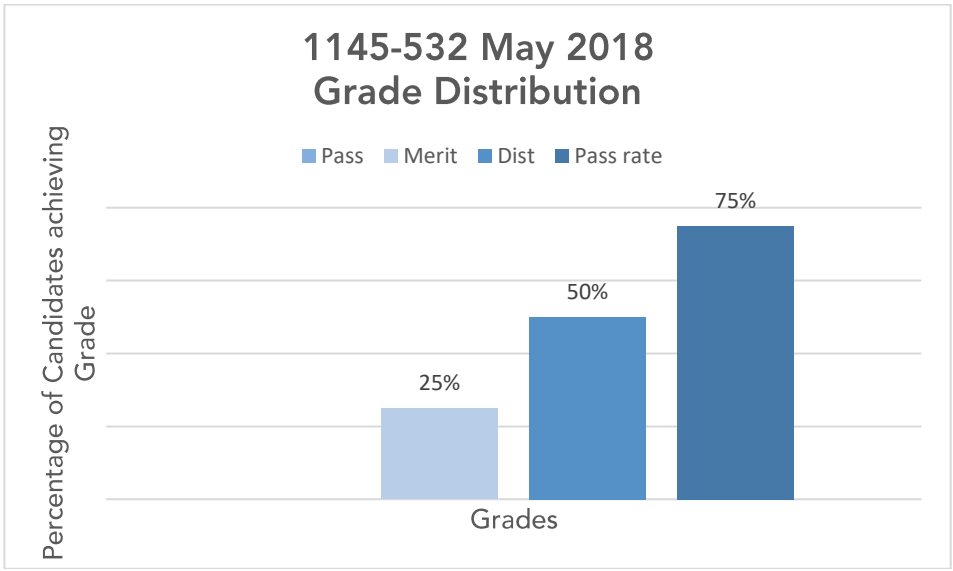


Assessment: 1145-532
Series: May/2018 (Summer)

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

| Total marks available | 60 |
|---|---|
| Pass mark | 21 |
| Merit mark | 31 |
| Distinction mark | 41 |

The graph below shows the distributions of grades and pass rate for this assessment:



# Chief Examiner Commentary

1145-532 – Level 3 Engineering - **Theory exam (1)**

**Series 1 – March 2018**

This is the second cohort of learners to complete this qualification. The questions and paper as a whole met the requirements of the specification and were of a similar level to the previous paper.

As the cohort was relatively small, it is difficult to draw statistical conclusions regarding candidate performance. However, in general this paper was well answered by the candidates. Most candidates attempted all of the questions and there was an observable variation in the level of responses between different candidates.

In addition to the feedback on the specific questions below, some common themes were also noted.
In questions on health and safety and the factors impacting innovation, the depth of knowledge demonstrated was typically limited. However, most candidates displayed a reasonable breadth of knowledge about low carbon technologies and virtual and augmented reality. When questions asked for explanation of specific points, most candidates demonstrated good understanding.

The synoptic questions and questions requiring longer answers were typically answered well and demonstrated the range of candidate abilities. Similar to the previous series, in some cases the responses lacked structure and would have benefitted from more planning or identifying the key points before attempting the question.

**Series 2 – May 2018**

This is the second cohort of learners to complete this qualification. The questions and paper as a whole met the requirements of the specification and were of a similar level to the previous paper.

As the cohort was relatively small, it is difficult to draw statistical conclusions regarding candidate performance. However, in general this paper was well answered by the candidates. Most candidates attempted all of the questions and there was an observable variation in the level of responses between different candidates.

In addition to the feedback on the specific questions below, some common themes were also noted.
In questions on health and safety and the factors impacting innovation, the depth of knowledge demonstrated was typically limited. However, most candidates displayed a reasonable breadth of knowledge about low carbon technologies and virtual and augmented reality. When questions asked for explanation of specific points, most candidates demonstrated good understanding.

The synoptic questions and questions requiring longer answers were typically answered well and demonstrated the range of candidate abilities. Similar to the previous series, in some cases the responses lacked structure and would have benefitted from more planning or identifying the key points before attempting the question.

# Synoptic Assignment – Year 1

## 1145-031 – Level 3 Engineering (1)

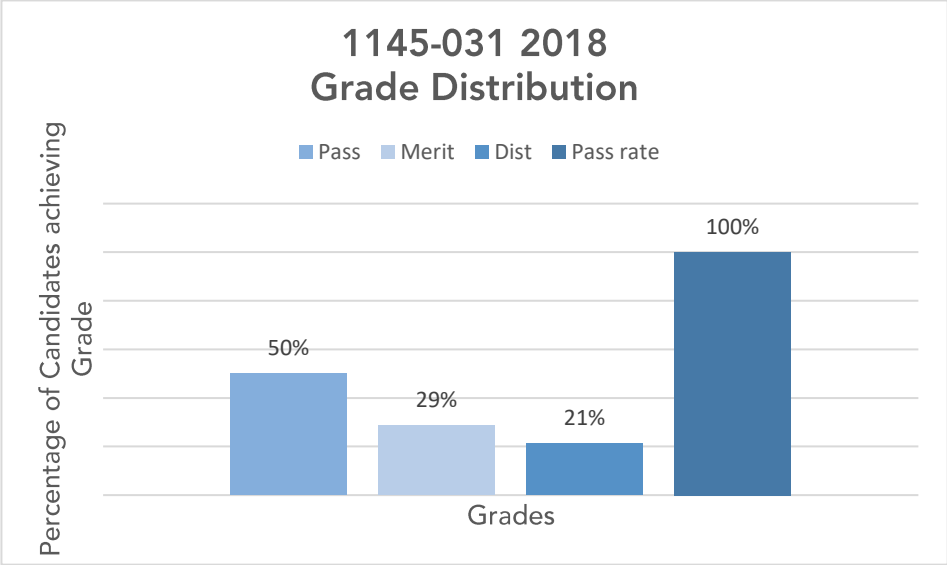
## Grade Boundaries

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

Assessment: 1145-031
Series: 2018

| Total marks available | 60 |
|---|---|
| Pass mark | 26 |
| Merit mark | 36 |
| Distinction mark | 46 |

The graph below shows the distributions of grades and pass rate for this assessment:



## Principal Moderator Commentary

The assignment was similar in level 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 design and manufacture of a programmable electronic door lock. 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).

AO1 (recall of knowledge) was generally well evidenced, with the design specification, investigation into potential designs and evaluation all using appropriate technical terms.

AO2 (understanding) was generally appropriately evidenced. Best evidence included reasons for the criteria in the design specification and reasons for the selection if the materials. Evidence could have been improved slightly by including increased annotation on the microcontroller programme, to indicate clear understanding of the sequence of activities being carried out.

A03 (practical skill) was typically appropriately evidenced, with relevant commentary on the practical observation form. Some centres could have improved the evidence provided by including pictures of the manufacturing operations in progress or the finished article.

AO4 (bringing it all together) was, in general, well evidenced, particularly in the factors considered when creating the design ideas and the evaluation.

Attending to detail (AO5) was typically not evidenced well. The evaluations carried out by the candidates were mainly subjective in nature; these were reinforced by subjective comments by the tutor assessor on the practical observation form. This could have been improved by including a test record sheet for the finished product, ideally with objective testing.

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.

# Synoptic Assignment – Year 2

## 1145-034 – Level 3 Engineering (2)

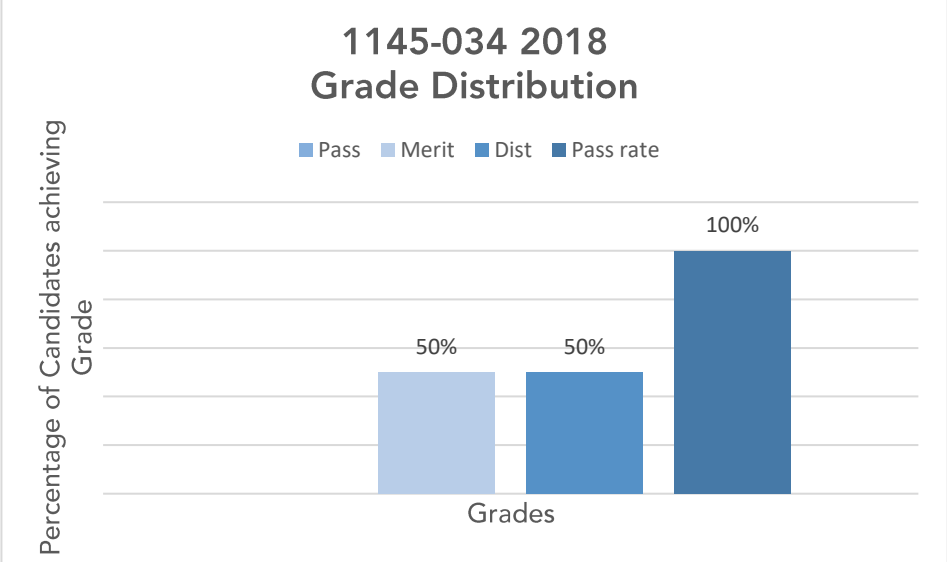
## Grade Boundaries

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

Assessment: 1145-034
Series: 2018

| Total marks available | 60 |
|---|---|
| Pass mark | 24 |
| Merit mark | 33 |
| Distinction mark | 42 |

The graph below shows the distributions of grades and pass rate for this assessment:



## Principal Moderator Commentary

The assignment was similar in level 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 design and manufacture of a robot to inspect the inside of a pipe. 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).

AO1 (recall of knowledge) was generally well evidenced, with the design specification, investigation into potential designs and evaluation all using appropriate technical terms.

AO2 (understanding) was typically not evidenced well. There was good evidence of understanding in the consideration of the design sketches and evaluation. However, evidence could have been improved by including reasons for the criteria in the design specification. Evidence could have been improved by including brief statements explaining the reasons for choices or the implications of alternative options and annotation on the microcontroller programme, to indicate clear understanding of the sequence of activities being carried out.

A03 (practical skill) was typically appropriately evidenced, with pictures of produced items and relevant commentary on the practical observation form. The manufactured prototypes typically appeared to be feasible.

AO4 (bringing it all together) was, in general, appropriately evidenced, particularly in the justification of the final design idea and the evaluation.

Attending to detail (AO5) was not evidenced well. The evaluations carried out by the candidates were mainly subjective in nature; these were reinforced by subjective comments by the tutor assessor on the practical observation form. This could have been improved by including a test record sheet for the final product, ideally with objective testing of its dimensions and performance.

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.