

NCFE Level 1/2 Technical Award in Engineering Studies (603/2963/4)

**Assessment date:** 26 November 2020

**Paper Number:** P001087

This report contains information in relation to the external assessment from the Chief Examiner, with an emphasis on the standard of learner work within this assessment window.

The aim is to highlight where learners generally perform well as well as any areas where further development may be required.

Key points:

- grading information
- administering the external assessment
- standard of learner work
- Regulations for the Conduct of External Assessment
- referencing of external assessment tasks
- evidence creation
- interpretation of the tasks and associated assessment criteria
- planning in the external assessment.

It is important to note that learners should not sit the external assessment until they have taken part in the relevant teaching of the full qualification content.

### Grade Boundary Information

Each learner's external assessment paper is marked by an Examiner and awarded a raw mark. During the awarding process, a combination of statistical analysis and professional judgement is used to establish the raw marks that represent the minimum required standard to achieve each grade. These raw marks are outlined in the table below.

| NYA | Level 1<br>Pass | Level 1<br>Merit | Level 1<br>Distinction | Level 2<br>Pass | Level 2<br>Merit | Level 2<br>Distinction |
|-----|-----------------|------------------|------------------------|-----------------|------------------|------------------------|
| 0   | 13              | 18               | 24                     | 30              | 40               | 50                     |

Grade boundaries represent the minimum raw mark required to achieve a certain grade. For example, if the grade boundary for the Pass grade is 25, a minimum raw mark of 25 is required to achieve a Pass.

| Maximum<br>UMS Score* | Level 1<br>Pass | Level 1<br>Merit | Level 1<br>Distinction | Level 2<br>Pass | Level 2<br>Merit | Level 2<br>Distinction |
|-----------------------|-----------------|------------------|------------------------|-----------------|------------------|------------------------|
| 160                   | 24              | 47               | 70                     | 92              | 115              | 138                    |

*\* In order to ensure that levels of achievement remain comparable for the same assessment across different assessment windows, all raw marks are converted to a points score based on a uniform mark scale (UMS). For more information about UMS and how it is used to determine overall qualification grades, please refer to the qualification specification.*

### Administering the external assessment

The external assessment is invigilated and must be conducted in line with our Regulations for the Conduct of External Assessment. Learners may require additional pre-release material in order to complete the tasks within the paper. These must be provided to learners in line with our Regulations.

Learners must be given the resources to carry out the tasks and these are highlighted within the Qualification Specific Instructions Document (QSID).

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### Standard of learner work

The external assessment was taken during the first full term of schools post lockdown. A number of learners did not attend the external assessment due to self-isolation. It would appear that centres entered learners who were unable to originally sit the external assessment back in March 2020.

The standard of learner work varied and clearly demonstrated the higher level 2 achievers down to a level 1 pass grade. Structured revision based on the qualification specification and using previous external assessment papers as well as resources in QualHub will help to fully prepare learners for the external examination.

Learner responses to the extended writing questions focussed mainly on the recall of knowledge of the question and applying that knowledge to the topic of the question within their written responses. Learners need to be taught the importance of formulating opinions and conclusions to this type of question and communicate them in a clear and focussed way within their written responses.

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### Regulations for the Conduct of External Assessment

#### Malpractice

There were some reported instances of malpractice in this assessment window. The Chief Examiner would like to take this opportunity to advise learners that instances of malpractice (copying of work from another learner, using the internet when word processing learner responses) will affect the outcome of the assessment.

#### Maladministration

There were no occurrences of maladministration reported from this series. However learners are still not accurately completing the learner information on the front of the assessment paper. It is important that Exams Officers ensure that learners correctly fill in their legal name, learner number and centre number to avoid confusion when examination scripts are being processed for marking.

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### Evidence creation

Learners should only use the space provided to answer questions within the assessment paper. Where answers are typed or additional pages included, the learners name, centre number, centre name and question number must be clearly visible. The additional paper should then be securely attached to the assessment paper.

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### Responses of the tasks within the sections of the external assessment paper

#### Q1

A multiple choice question which was well answered by learners.

#### Q2

Again, learners performed well in this multiple choice question.

#### Q3

Learners accurately described what hazards the footwear protected the user from. However, learners did not fully identify the different features of the footwear that protected the user from injury, for example, a steel toe cap to prevent the foot from being injured by falling heavy objects.

#### Q4(a)

Most learners correctly identified that smoke and fumes were hazards that could be removed from an automotive workshop.

#### Q4 (b)

A number of learners struggled to fully answer this question. Some learners correctly identified that wearing a mask and isolating a process or machine were suitable ways to control dust in the workshop. Some learners correctly identified a method, however if the learner went on to explain how the method controlled dust as well as how it can reduce the hazard to the workforce they would be awarded the full marks.

#### Q5

Many learners correctly answered this question with examples of grams and kilograms. Some learners incorrectly stated moles which is a measurement of substance and not mass.

#### Q6(a)

This question performed well with learners correctly identifying that thermal referred to a material's melting point.

#### Q6(b)

In this question learners appeared to not be able to identify specific mechanical properties of lead and identified and explained generic mechanical properties for pure non-ferrous metals rather than ones specific to lead.

#### Q6(c)

This question performed well with learners correctly identifying that stainless steel is a ferrous metal.

### Q7

Some learners incorrectly identified products used in kitchenware rather than two ceramic materials which could be used for kitchenware.

### Q8

The majority of learners correctly identified materials that have been developed to be able to design and install the pedestrian bridge. Learners also discussed how technology has developed and allowed engineers to model and test designs in the virtual world before construction. However, learners were not awarded marks if their responses did not draw conclusions to support the knowledge that was identified and explained.

### Q9

This question was well answered by learners. They correctly identified the equations to use from the front of the assessment paper and worked out the correct answer.

### Q10(a)

A reasonably well answered question with learners correctly converting 1 inch into mm.

### Q10(b)

A multiple choice question which was well answered by learners.

### Q10(c)

This multiple choice question was also well answered by learners.

### Q10(d)

A large number of learners struggled to identify the three different three- dimensional projection methods. Learners mostly identified the isometric drawing example, some identified the two point perspective. However not many students correctly identified the axonometric drawing.

### Q11

The majority of learners demonstrated a good understanding of tolerance and correctly answered this question.

### Q12

The majority of learners correctly identified micromoles as the unit for substance.

### Q13

A variety of answers were provided due to learners not fully reading and understanding the question.

### Q14

Learners correctly linked chemical engineering to the manufacture of pharmaceuticals in this multiple choice question.

### Q15

Most learners incorrectly identified that epoxy resin is a thermosetting polymer. Learners focused upon the need for the bolt to be held securely in place but did not expand upon the properties of thermosetting polymers in general to achieve the full marks for this question.

### Q16(a)

Many learners correctly identified the tool as an angle grinder.

### Q16(b)

Most learners correctly identified the control measures for operating the angle grinder. Learners needed to have expanded their descriptions in order to achieve full marks in this question.

### Q16(c)

The majority of learners correctly identified the tool as a hot glue gun and could describe how to safely operate it.

### Q17

Learners correctly identified and explained how engineering has transformed the communications sector. Mobile phones and the development of phone lines and the internet were well explained in the context of both people communicating with each other but also in situations such as the military and within the manufacturing industry.

### Q18(a)

A range of good responses were provided by learners from magnetic screwdrivers, drills and magnetic locks.

### Q18(b)

A number of learners did not fully read this question where they were asked to state an application for diamond in an engineering product. Some learners identified jewellery rather than engineering products, such as cutting blades and drill bits.

### Q19(a)

This question was well answered with learners identifying the correct equation from the list and accurately calculating the actual length of the component.

### Q19(b)

Many learners struggled with this question as they did not approach the answer using a step by step process, calculating the volume of the cube and cylinder first, then working out the remaining volume. Learners were mostly successful at calculating the cube's volume, however confused the radius and diameter which resulted in the volume of the cylinder being incorrectly calculated. Once the total volume of the cube, minus the cylinder was calculated, the density could therefore be worked out using the equations within the assessment paper.

### Q20

Most learners identified that GRP (Glass Reinforced Plastic) has a high strength to weight ratio and is impact resistant. Learners need to explain these properties in relation to the oil rig rescue boat to demonstrate they understand why the material has been chosen for use in the rescue boat on an oil rig.

### Q21

The question asks learners to explain how engineering has considerably improved prosthetics for users. Good points were made in relation to the development of materials and that modern prosthetics could interact with the human body to benefit a user's experience. Some learners focussed on the quality of life being improved for the user but did not develop responses based upon the development of the actual prosthetic in engineering terms.

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**Chief Examiner:** Peter Groves

**Date:** January 2020

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