

## **CAMBRIDGE NATIONALS**

*Exemplar Candidate Work*



# ***ENGINEERING MANUFACTURE***

**J832, J842**

**R109 Summer 2019  
examination series**

Version 1

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# Introduction

These exemplar answers have been chosen from the summer 2019 examination series.

OCR is open to a wide variety of approaches and all answers are considered on their merits. These exemplars, therefore, should not be seen as the only way to answer questions but they do illustrate how the mark scheme has been applied.

Please always refer to the specification <https://www.ocr.org.uk/Images/150707-specification.pdf> for full details of the assessment for this qualification. These exemplar answers should also be read in conjunction with the sample assessment materials and the June 2019 Examiners' report or Report to Centres available from Interchange <https://interchange.ocr.org.uk/>.

The question paper, mark scheme and any resource booklet(s) will be available on the OCR website from summer 2020. Until then, they are available on OCR Interchange (school exams officers will have a login for this and are able to set up teachers with specific logins – see the following link for further information <http://www.ocr.org.uk/administration/support-and-tools/interchange/managing-user-accounts/>).

It is important to note that approaches to question setting and marking will remain consistent. At the same time OCR reviews all its qualifications annually and may make small adjustments to improve the performance of its assessments. We will let you know of any substantive changes.

# Questions 1(a)(i), 1(b)(i), 1(b)(ii), 1(c)(i)

## Examiner commentary

As an untiered paper there will be many sub-questions in which all candidates from P1 upwards should be able to achieve marks. Such questions include those with an objective-based format such as: circling the correct word, ticking the correct box or writing a single word in an answer line:

### Exemplar 1

- (i) **Circle** the material from the list below which is commonly used to make children's toys such as the construction bricks.

copper

lead

ABS

concrete

epoxy resin

[1]

As expected in this series a significant majority of candidates achieved well on these types of questions. Some candidates, however, did not gain credit for these types of question which indicates a lack of breadth of subject knowledge. Also lack of security or depth of knowledge was in also evident in subsequent sub-questions.

Learning Outcome (LO) LO1 in the specification lists all the materials that a candidate should know about; all the ones indicated with a 'i.e.'. Centres could better prepare their candidates for these objective-type questions through learning activities which reinforce knowledge and understanding such as: matching, sorting and grouping activities using cards with pictures, cards with names of materials and the real objects/materials. Activities such as these lend themselves to reinforcement of knowledge by frequent repetition.

Other areas where candidates did not gain credit were by giving more than one response when only one was called for, or very rarely by providing no response to questions like those shown in Exemplar 2. Both are areas where centres can focus on examination technique when training their candidates (i.e. by only providing one response when requested, and by not leaving questions unanswered).

### Exemplar 2

- (i) **Circle** the material from the list below which is commonly used to make children's toys such as the construction bricks.

copper

lead

ABS

concrete

epoxy resin

[1]

Candidates who wish to change a response should make sure that it is obvious which response is to be marked and which to be discarded - a good example of this is shown in Exemplar 3.

### Exemplar 3

- (i) **Circle** the material from the list below which is commonly used to make children's toys such as the construction bricks.

copper

lead

ABS

~~concrete~~

epoxy resin

[1]

Centres can perhaps better prepare candidates not to make these simple mistakes by getting candidates to practise working on past paper questions. There are many examples on the OCR website; and centres can now construct their own exam papers using the OCR online ExamBuilder system.

# Questions 1(a)(ii), 1(b)(iii), 1(c)(ii), 2(a), 2(b)

## Examiner commentary

In addition to the types and uses of material, candidates must be taught about the properties of such materials. Again, the properties are listed in LO1 of the unit specification.

Centres could help reinforce specific subject knowledge using similar match/group/sort activities as above, this time focusing on the materials and their associated properties.

Lack of understanding in material property knowledge was evident in responses to several questions especially where short written responses were required. Typically, the gaps in subject knowledge were lack of detail in the responses given, or confusing material property types being given.

Exemplar 4 illustrates lack of detail in the response. Not all grades of steel are corrosion resistant and the response would need for example qualification with the grade of steel (for example 'stainless steel'). Also 'changing shape' is not specific enough for malleability as hammering is not mentioned in the question or response. This candidate's response gained 4 marks.

## Exemplar 4

The first one has been done for you.

Property	Meaning	Metal
Hardness	Resistance of a metal to being deformed, not easy to bend, cut or shape.	Tungsten
Machinability	How easy metal can be cut off	Aluminium
Malleability	How easy a metal can be <del>made</del> change shape and go in different directions	Copper
Corrosion Resistance	The resistance of a metal to rust by oxidation or a chemical reaction	Steel

[6]

Candidates also lost marks for repeating the property from the first column of the table, effectively repeating the stem of the question instead of writing the meaning. In this example, the meaning of machinability is a repeat of the property from the stem. The correct response would have required some reference to ease of cutting. Corrosion resistance was another example where many candidates simply repeated the property (e.g. ability to resist corrosion).

In Exemplar 5 which follows, the candidate has correctly referred to oxidation which did gain credit. Again, the response has not gained credit for the meaning of malleability for the reason above and gained 4 marks.

## Exemplar 5

The first one has been done for you.

Property	Meaning	Metal
Hardness	Resistance of a metal to being deformed, not easy to bend, cut or shape.	Tungsten
Machinability	how easily the material can be machined	Aluminium.
Malleability	Can flex and bend into different shapes.	Copper
Corrosion Resistance	does not oxidise when out side	Copper

[6]

It is essential that candidates understand command words and can apply them correctly to the questions. The command words used are given in the Appendix D of the Specification for example:

Evaluate	Make a qualitative judgement taking into account different factors and using available knowledge/experience
Explain	Set out the purposes or reasons

Strategies that can be used to better equip candidates for using command words effectively include; presenting past paper questions and not asking for the specific answer but asking what the answer would look like. This could be taken further by taking past paper questions and asking candidates to answer the question repeatedly but with the command word changed (e.g. name, give, state, describe, explain) while keeping the stem the same as far as possible.

## Question 6 (c)

(c)\* Discuss the statement, 'Globalisation is good for engineering companies but has a major impact on local industry.'

.....

.....

..... [6]

### Examiner commentary

Each R109 paper is worth 60 marks in total, with 10% of the marks representing extended response questions (i.e. a 6 mark question). The importance of the 6 mark questions to gaining a good overall grade cannot be underestimated. Centres could better prepare their candidates for this type of question in several ways:

First, explicitly conveying to their candidates the importance of this type of question and that providing no response (NR) is not advisable. All candidate, irrespective of predicted level, should be encouraged to at least provide some response to this type of question.

In particular, centres could explicitly show candidates example questions along with the mark scheme, emphasising the large number of indicative marking points available in the guidance column for which credit can be given; and that if two or three of these marking points are met, candidates are likely to gain some credit for their response.

Question	Answer	Marks	Guidance
(c)*	<p><b>Level 3 (5–6 marks)</b> Detailed discussion showing a clear understanding of Globalisation and the advantages that it brings to Engineering companies. Consideration of the impact globalisation has on local industry.</p> <p>Specialist terms will be used appropriately and correctly. The information will be presented in a structured format. The candidate can demonstrate the accurate use of spelling, punctuation and grammar.</p> <p><b>Level 2 (3–4 marks)</b> Adequate discussion showing an understanding of Globalisation and the advantages that it brings to Engineering companies. Some consideration of the impact globalisation has on local industry.</p> <p>There will be some use of specialist terms, although these may not always be used appropriately. The information will be presented for the most part in a structured format. There may be occasional errors in spelling, punctuation and grammar.</p> <p><b>Level 1 (1–2 marks)</b> Basic discussion showing limited understanding of Globalisation and the advantages that it brings to Engineering companies. Limited consideration of the impact globalisation has on local industry.</p> <p>There will be little or no use of specialist terms. Answers may be ambiguous or disorganised, and may be comprised of simplistic bullet points. Errors of spelling, punctuation and grammar may be intrusive.</p> <p>0 = a response that is irrelevant and/or not worthy of a mark. Annotate with 'Seen' at end of response.</p>	6	<p>Discussion or detailed explanation of Globalisation and the advantages that it brings to Engineering companies. Consideration of the impact globalisation has on local industry.</p> <p>Responses regarding globalisation may include reference to:</p> <ul style="list-style-type: none"> <li>• Quality of product produced.</li> <li>• Reduced production costs – economy of scale</li> <li>• Greater buying power</li> <li>• Reduced labour costs</li> <li>• Increased transport costs</li> <li>• Increased delivery costs (depending upon where manufactured and where in world requires product).</li> <li>• Brings labour/work/job opportunities to some communities.</li> <li>• Lower wage demands.</li> <li>• Less restrictions on production regulations.</li> <li>• Less restriction on environmental impacts</li> <li>• Cheaper products available to customers.</li> </ul> <p>Responses regarding local industry may include reference to:</p> <ul style="list-style-type: none"> <li>• Reduction in job opportunities</li> <li>• Failure to be competitive with prices.</li> <li>• Loss of jobs</li> <li>• Factory closures</li> <li>• Loss of local skills/tradition</li> <li>• Specialisation/ high value products</li> </ul>

In addition to coaching on the meaning of command verbs, candidates would also benefit from being shown how to deconstruct the question stem into the parts that need to be addressed. From the June 2019 paper 'to discuss' is clearly the command verb meaning that candidates are expected to:

Detailed	Point-by-point consideration of (e.g. analysis, argument)
Discuss	Present, explain and evaluate salient points (e.g. for/against an argument)
Effective	Applies skills appropriately to a task and achieves the desired outcome; successful in producing a desired or intended result

Showing candidates how to deconstruct the question into the two parts 'globalisation is good for engineering companies' and 'major impact on local industry' should help them to be able to present, explain and evaluate salient point from both sides of the argument.

By way of exemplification, if a candidate discusses just one part of the deconstructed question then they will be approximately halving the number indicative marking points that they could potentially meet.

Exemplar 6 does not explicitly address globalisation or the impact on local industry. So, no marks were given but a simple explicit statement showing which part of the question each line referred to would have resulted in 3 marks being given.

## Exemplar 6

- (c)\* Discuss the statement, 'Globalisation is good for engineering companies but has a major impact on local industry.'

Cheaper Manu-facture  
 more jobs worldwide  
 cheaper Resources

Exemplar 7 was given 3 marks. Relation to globalisation or local industry is made clear and explicit. For globalisation credit was given for the product quality marking point, whereas the first three lines are really a description of what globalisation is. For local industry, factory closures and loss of jobs was given credit, securing this response 3 marks. There were clearly a whole host of other salient points both for globalisation and local industry that would have given extra credit.

## Exemplar 7

- (c)\* Discuss the statement, 'Globalisation is good for engineering companies but has a major impact on local industry.'

globalisation allows engineering companies  
 to work across the globe <sup>with</sup> ~~and~~ other companies  
 and suppliers. this allows engineering companies  
 to maintain a higher standard of quality  
 from the better materials and technology  
 they get access to. this means that they  
 are not forced to work with the nearest  
 suppliers but the best one so it could cause  
 some suppliers to have to shut down which causes  
 an increase in unemployment in the local  
 community.

[6]



In contrast, Exemplar 8 explicitly links most of their statements to globalisation or local industry and there is a minimum of three statements for each, although there is degree of repetition. This is therefore a sound Level 3 response. The final mark given was 5 marks because some of the salient points were either repeated or there was some ambiguity regarding reference to globalisation or local industry.

## Exemplar 8

(c)\* Discuss the statement, 'Globalisation is good for engineering companies but has a major impact on local industry.'

Globalisation means less products will be  
manufactured in the local industry. This  
will mean less jobs are made as they are  
taken up abroad or jobs could be lost  
because of this. It is also good for companies  
as they pay less for workers which means  
the products cost less to make as the workers have  
a lower salary. This also means they can  
produce more products at a lower price.  
However, the company gets a worse image  
because they don't work ethically as they  
don't have as many people working for  
them in the local industry. This can affect the  
companies profits. [6]

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