



## 0171-518 MARCH 2018 Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

Level 3 Land-Based Engineering – Theory exam (2)

If provided, stick your candidate barcode label here.

Friday 9 March 2018 13:30 – 15:30

Candidate name (first, last)		
First		
Last		
Candidate enrolment number	Date of birth (DDMMYYYY)	Gender (M/F)
Assessment date (DDMMYYYY)	Centre number	Candidate signature and declaration*
• If any additional answer sheets a	re used, enter the additional	number of pages in this box.

- Please ensure that you staple additional answer sheets to the back of this answer booklet, clearly labelling them with your full name, enrolment number, centre number and qualification number in BLOCK CAPITALS.
- All candidates need to use a **black/blue pen. Do not** use a pencil or gel pen.
- If provided with source documents, these documents **will not** be returned to City & Guilds, and will be shredded. **Do not** write on the source documents.

\*I declare that I had no prior knowledge of the questions in this assessment and that I will not divulge to any person any information about the questions.

## You should have the following for this examination

- a pen with blue or black ink
- a non-programmable calculator

## **General instructions**

- Use black or blue ball-point pen.
- The marks for questions are shown in brackets.
- This examination contains 11 questions. Answer **all** questions.
- Answer the questions in the spaces provided. Answers written in margins or on blank pages will **not** be marked.
- Cross through any work you do not want to be marked.

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(1 mark)

1 a) Identify the type of gear assembly shown in Figure 1.



http://www.greenfries.info/geartypes.htm

Figure 1

b) Describe **four main** benefits of the gear assembly shown in Figure 1.

(4 marks)

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2	Describe <b>three main</b> advantages of using a helical gear in a transmission system, compared to a spur gear. Give reasoning for the advantages given.	(5 marks)
3	a) Identify the type of bearing shown in Figure 2.	(1 mark)

https://intechbearing.com/products

Figure 2

Describe **one** method used to pre load a bearing assembly using the type of bearing shown in Figure 2. b)

(2 marks)

(2 marks)

4 Using Figure 3, identify the points marked A and C.



http://www.technologystudent.com

Figure 3

5 Figure 4 shows a compound gear train. Gear A has 40 teeth, gear B has 60 teeth, gear C has 20 teeth and gear D has 80 teeth. Determine the overall ratio of the drive train, showing all working.

(4 marks)



http://thecartech.com

Figure 4

6 a) Identify the type of clutch shown in Figure 5.

(1 mark)



http://www.engineeringinspiration.co.uk



b) Using Figure 5, identify components C, D and E.

(3 marks)

(2 marks)

7 Describe **two** functions of a synchroniser in a synchromesh transmission.

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a)	Describe <b>two</b> methods of engaging a synchroniser in a synchromesh transmission system.	(4 marks
b)	A synchroniser keeps disengaging. What is the <b>most</b> likely cause of this problem?	(1 mar
<b>A</b> thus		
Ехр	actor with a full powershift transmission has a slipping clutch within the system. lain <b>three</b> possible causes of the problem and how they affect the operation ne system.	(6 mark

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10 a) Identify the type of transmission system shown in Figure 6.

(1 mark)



b) Using Figure 6, identify the components labelled A, C and D.

(3 marks)

It has been noticed that the wheel motors are slow to rotate when travelling up hill or when heavily loaded. Referring to Figure 6, explain **four** possible causes C) for this problem. (8 marks)

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