0171-518 MARCH 2019
Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)
Level 3 Land-Based Engineering – Theory exam (2)

Friday 8 March 2019
13:30 – 15:30

If provided, stick your candidate barcode label here.

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 additional answer sheets are used, enter the additional number of pages in this box.
• Before taking the examination, all candidates must check that their barcode label is in the appropriate box. Incorrectly placed barcodes may cause delays in the marking process.
• Please ensure that you staple additional answer sheets to the back of this answer booklet, clearly labelling these 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, unless otherwise instructed.
• 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 examination 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 12 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.
1  a) What type of gear is shown in Figure 1? (1 mark)

b) What type of load does the gear shown in Figure 1 exhibit? (1 mark)

c) State **three** disadvantages of the gear shown in Figure 1. (3 marks)

http://www.globalspec.com

**Figure 1**
2 a) What type of chain is shown in Figure 2? (1 mark)

b) Describe **three** benefits of the chain shown in Figure 2. (3 marks)

https://dir.indiamart.com

Figure 2
3  a) What belt would be used in conjunction with the pulley in Figure 3? (1 mark)

b) Identify one maintenance check that should be carried out on this type of belt in a transmission system. (1 mark)

http://www.lockingdevice.net

Figure 3

4  Describe four symptoms of incorrectly adjusted bearing pre-load on a transmission system. (4 marks)

5  State the four components that make up an epicyclic unit found in a tractor final drive system. (4 marks)
6 a) If a single plate dry clutch is experiencing slipping when driving, what are **five** most likely causes? (5 marks)

b) A single plate dry clutch exhibits a rumbling sound when engaged. Describe **two** most likely causes. (2 marks)

7 In a single plate clutch, describe **four** advantages of a spring disc hub compared to a rigid disc hub. (4 marks)
8 Describe **five** advantages of a continuously variable transmission (CVT). 

9 Describe the function of **seven** hydraulic components found in a hydrostatic transmission system.
10 A large gear is driving a small gear. The large gear rotates at 165 rpm and the small gear rotates at 330 rpm. What is the gear ratio between the two gears? (2 marks)

11 State four main components found in a tractor CVT transmission system. (4 marks)
A combine harvester with a hydrostatic transmission system has lost drive in forward and reverse. Discuss the preparation stages, resources and steps required to carry out a full diagnostic assessment.