



0171-516 MARCH 2022

Level 3 Advanced Technical Extended Diploma in Land-Based Engineering (1080)

Level 3 Land-Based Engineering – Theory Exam (1)

If provided, stick your candidate barcode label here.

**Thursday 3 March 2022
09:30 – 11:30**

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 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

General instructions

- Use black or blue ball-point pen.
- The marks for questions are shown in brackets.
- This examination contains 10 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.



4 State the function of the following electrical components.

a) Relay. (1 mark)

b) Diode. (1 mark)

c) Fixed resistor. (1 mark)

(Total marks 3)

5 a) Explain the term 'sulphating' in relation to a lead-acid battery. (4 marks)

b) Explain the electro-chemical reaction that occurs in a lead-acid battery when it is being charged in a vehicle alternator. (5 marks)

(Total marks 9)

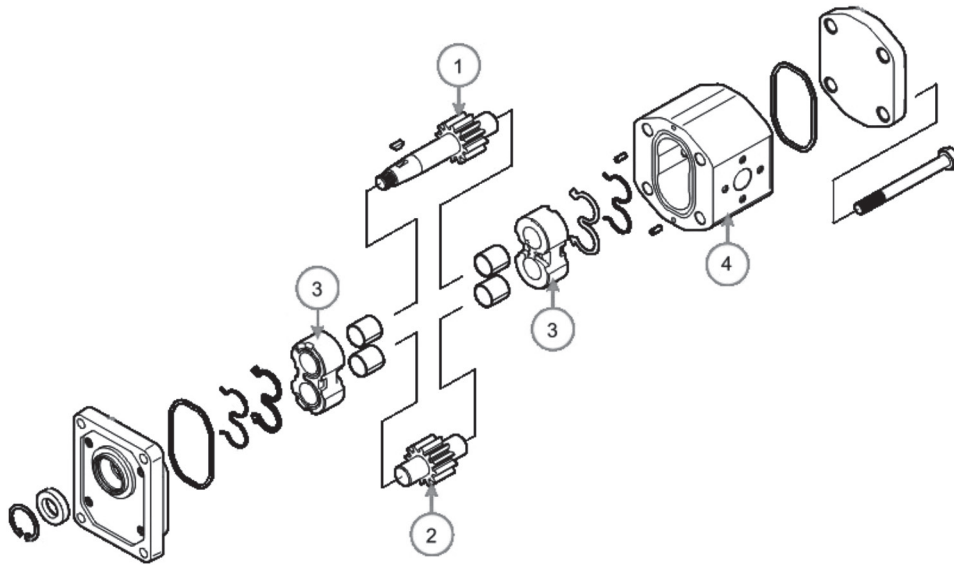
6 State **three** applications of GPS when using land-based machinery. (3 marks)

7 Explain how remote telematic monitoring systems can reduce breakdowns. (4 marks)

8 Explain why manufacturers' diagnostic scan tools require software upgrades. (5 marks)

This page has been left blank intentionally

9 The hydraulic pump in Figure 1 has been removed from a machine. When tested, the output of the pump was operating below specification.



www.jbj.co.uk

Figure 1

a) Identify this type of pump.

(1 mark)

b) State the **two** readings which would indicate the condition of the pump when tested on the machine.

(2 marks)

c) Explain the function of each of the following labelled components in Figure 1.

i) 1 **and** 2

(4 marks)

ii) 3

(2 marks)

iii) 4

(3 marks)

(Total marks 12)

