



## 4292-520 MARCH 2022

### Level 2 Technical Award in Vehicle Technology

#### Level 2 Vehicle Technology – Theory exam (1)

If provided, stick your candidate barcode label here.

Thursday 24 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 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.



1 a) i) State the metric unit of measurement used when recording the weight of a vehicle component. (1 mark)

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ii) State the SI unit of force used when calculating the coefficient of friction. (1 mark)

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b) i) Explain why worn tyres are more likely to provide less grip in wet conditions. (2 marks)

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ii) Explain why friction is needed between a clutch friction plate and a flywheel face. (2 marks)

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(Total marks 6)

2 a) Explain **one** reason why thermoplastics are used for the construction of vehicle body and trim components. (2 marks)

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b) Explain the effect to a vehicle's braking system if brake fluid exceeds its boiling point. (3 marks)

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(Total marks 5)

3 a) State the **two** units required to calculate electrical power. (2 marks)

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b) Explain the relationship between the **two** units identified in 3a), when calculating electrical power. (2 marks)

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(Total marks 4)

4 a) State **three** types of headlight lamps that are fitted to vehicles. (3 marks)

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b) A 24 volt circuit consumes 6 amps. Calculate the internal resistance of the circuit, showing the formula and working out. (3 marks)

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(Total marks 6)

5 a) i) Identify the HGV power unit layout in Figure 1.

(1 mark)

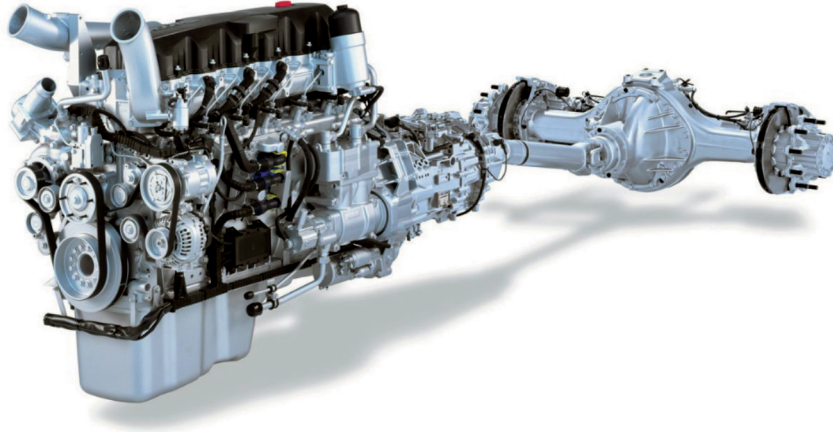


Image of HGV component – Published Anonymously – spt.co.nz

**Figure 1**

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ii) Identify the HGV transmission drive layout in Figure 1.

(1 mark)

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b) Explain **one** reason why a front wheel drive transmission layout is used in a light vehicle.

(2 marks)

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(Total marks 4)

- 6 a) i) Identify the all-terrain vehicle (ATV) rear drive train type in Figure 2. (1 mark)



Image of ATV rear drive train – Published Anonymously – midwesttraction.com

**Figure 2**

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- ii) Identify the all-terrain vehicle (ATV) rear drive train type in Figure 3. (1 mark)



Image of ATV rear drive train – Published Anonymously – atv.com

**Figure 3**

b) i) Explain **one** reason why the rear drive train type identified in Figure 2 would be used. (2 marks)

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ii) Explain **one** reason why the rear drive train type identified in Figure 3 would be used. (2 marks)

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(Total marks 6)

7 Explain the operating principle of an electric motor. (4 marks)

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8 a) Identify the suspension component in Figure 4. (1 mark)

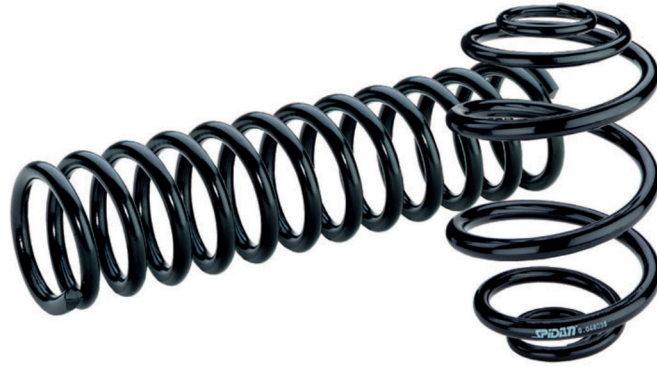


Image of suspension component – Published Anonymously – gknautomotive.com

**Figure 4**

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b) State **one** purpose of the suspension component in Figure 4. (1 mark)

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(Total marks 2)

9 Explain **two** reasons why an air suspension system is fitted to heavy goods vehicles. (4 marks)

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10 a) i) Identify the measuring tool in Figure 5.

(1 mark)



Image of measuring tool – Published Anonymously – cromwell.co.uk

**Figure 5**

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ii) Identify the measuring tool in Figure 6.

(1 mark)



Image of measuring tool – Published Anonymously – cromwell.co.uk

**Figure 6**

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b) State **one** braking system component that can be measured using the tool in Figure 6.

(1 mark)



- c) Explain the importance of periodically calibrating the measuring tool in Figure 6, before measuring a braking component. (2 marks)

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- d) Explain why tyre pressure should **not** be checked at the end of a long journey. (2 marks)

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(Total marks 7)





