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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. ➡ 0 0
- 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.

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

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

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

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

(Total marks 6)

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

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

(Total marks 5)

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

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

(Total marks 4)

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

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

(Total marks 6)

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

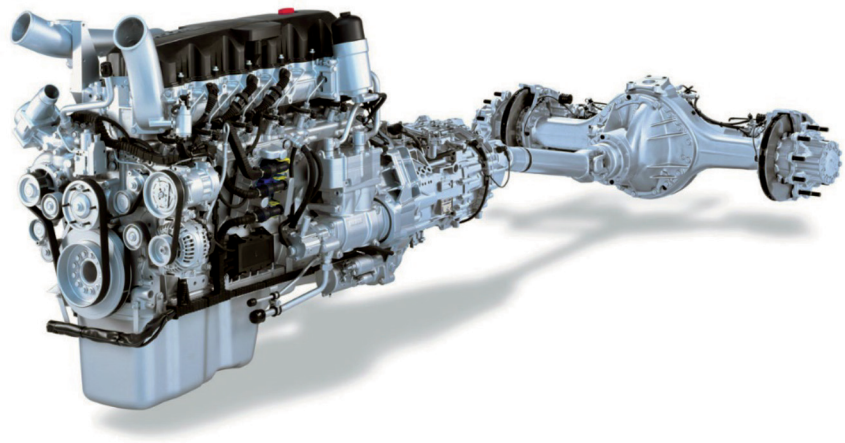

Image of HGV component – Published Anonymously – spt.co.nz

Figure 1

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

b) Explain **one** reason why a front wheel drive transmission layout is used in a light vehicle. (2 marks)

(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

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

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

(Total marks 6)

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

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

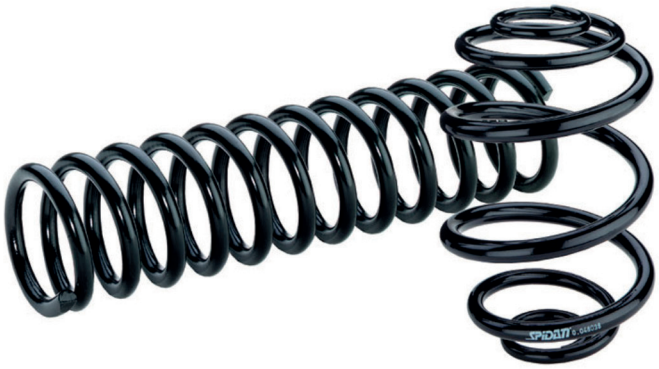

Image of suspension component – Published Anonymously – gknautomotive.com

Figure 4

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

(Total marks 2)

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

10 a) i) Identify the measuring tool in Figure 5. (1 mark)

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

Figure 5

ii) Identify the measuring tool in Figure 6. (1 mark)

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

Figure 6

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)

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

(Total marks 7)

See next page

11 Vehicles may be fitted with coil springs or leaf springs.

Compare the use and operation of these **two** types of springs. Provide a recommendation, with an explanation, for which spring type would be **most** suitable for carrying heavy loads. (12 marks)

See next page

End of examination