



**4292-522 MARCH 2018**  
**Level 2 Technical Certificate in Automotive**  
 Level 2 Automotive – Theory Exam (1)

If provided, stick your candidate barcode label here.

**Thursday 15 March 2018**  
**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 any additional answer sheets are 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 assessment**

- a pen with blue or black ink

**General instructions**

- Use black or blue ball-point pen. Use pencil for drawing only.
- 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.
- Write all your working out and answers in this booklet.



- 1 a) State **two** health and safety requirements when handling and storing flammable liquids. (2 marks)

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- b) State **two** reasons why accidents can occur in the workplace. (2 marks)

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- 2 Compare the differences between being self-employed and being employed by a garage. (4 marks)

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3 a) State **two** checks that are carried out when inspecting a camshaft drive belt. (2 marks)

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b) Name **two** tasks that are carried out on an interim vehicle service. (2 marks)

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4 a) Explain why dynamic balancing equipment is used to balance wheels and tyres. (2 marks)

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b) State **two** pieces of equipment used to check the battery in Figure 1 for serviceability. (2 marks)



Source: <https://www.hardwareexpress.co.uk>

**Figure 1**

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5 a) Explain the reasons why a disc brake is used on a vehicle rather than a drum brake. (4 marks)

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b) State **two** reasons why a braking system is required on a vehicle. (2 marks)

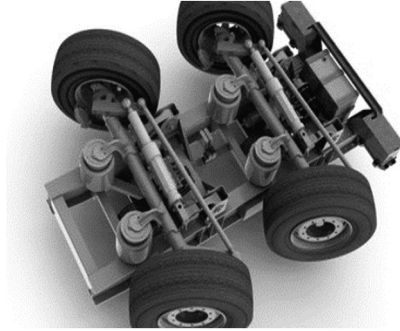
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6 a) i) Identify the steering system in Figure 2 and the type of vehicle it is fitted to. (2 marks)



Source: <http://www.cvdc.eng.cam.ac.uk/directory/research-themes/active-steering-of-long-combination-vehicles>

**Figure 2**

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ii) State **two** reasons why vehicles require a steering system. (2 marks)

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b) Explain what is meant by the terms 'rake' and 'trail angle' on a motorcycle steering system. (3 marks)

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7 a) Explain why independent suspension systems are used. (2 marks)

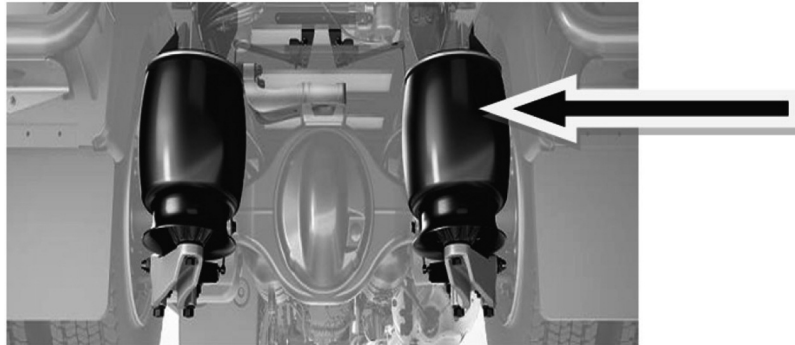
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b) Identify the heavy vehicle suspension component as arrowed in Figure 3. (1 mark)



Source: <http://www.mercedes-benz.co.uk>

**Figure 3**

8 a) i) State **two** different engine locations used by vehicle manufacturers. (2 marks)

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ii) Describe why manufacturers use a range of different engine locations when designing vehicles. (2 marks)

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b) Explain the four stroke cycle in a compression ignition engine. (4 marks)

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c) i) Identify the engine component in Figure 4. (1 mark)



Source: <http://www.motor-car.co.uk>

**Figure 4**

ii) State **two** reasons why the component shown is used in an engine. (2 marks)

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9 a) i) Explain why it is important **not** to disconnect a battery when the engine is running. (2 marks)

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ii) State **three** pieces of equipment that are used to check for correct operation of a vehicle's charging system. (3 marks)

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b) State **two** internal faults that can affect a vehicle's battery. (2 marks)

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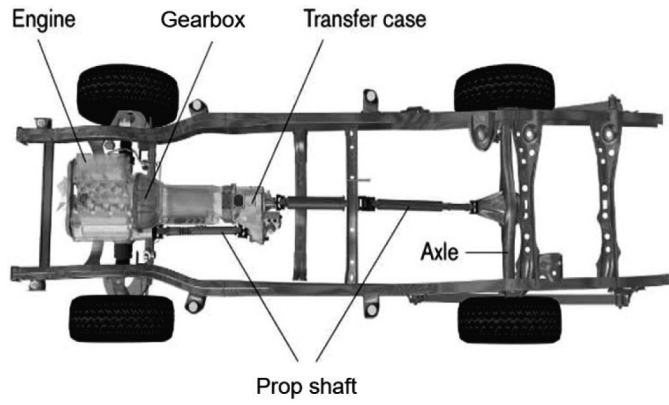
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10 a) Identify the drive layout of the vehicle shown in Figure 5. (1 mark)



Source: <https://www.iamnotanartist.org>

Figure 5

b) Describe how the drive is transmitted from the gearbox to the road wheels in the system shown in Figure 5. (3 marks)

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11 State **one** advantage and **one** disadvantage of using a dual clutch (DSG) gearbox. (2 marks)

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12 A customer has brought their vehicle into the workshop. They have informed the Service Advisor that the vehicle steering wheel is not aligned after hitting a kerb.

You have been asked to look at the vehicle and to check for any damage and misalignment.

Propose a thorough explanation of how to carry out these checks including health and safety considerations, identification and description of the components that could be damaged and why it could cause the fault.

(9 marks)

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