4292-520 JUNE 2018
Level 2 Technical Award in Vehicle Technology
Level 2 Vehicle Technology – Theory Exam (1)

If provided, stick your candidate barcode label here.

Thursday 14 June 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 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.
• Write all your working out and answers in this booklet.
1 a) Describe what is meant by the term 'Coefficient of friction'. (2 marks)

b) i) Explain the relationship between a clutch and a flywheel during drive. (2 marks)

ii) Explain the effect on clutch efficiency if the flywheel surface was contaminated with oil. (2 marks)

2 a) Explain why ferrous materials are used in vehicle body panel construction. (3 marks)

b) Explain why vehicle brake fluid must be changed regularly. (2 marks)
3 a) i) Identify the test equipment in Figure 1. (1 mark)

![Figure 1](https://www.shutterstock.com/image-photo/auto-mechanic-uses)

ii) State what electrical unit is being measured. (1 mark)
b) Figure 2 shows an electrical circuit. The voltage supplied is 12 Volts and the lamp consumes 9 Watts.

Source: https://www.teachengineering.org/lessons/view/cub_electricity_lesson05

**Figure 2**

Using the following formula, calculate the current flow when the switch is closed. Show working out in your answer. (2 marks)

\[
\text{Current} = \frac{\text{Power}}{\text{Voltage}}
\]
4  a) State **three** purposes of a battery.  

b) Explain the advantages of fitting Light Emitting Diode (LED) headlamps to vehicles. 

5  a) State **two** reasons why four stroke compression ignition engines are used in heavy goods vehicle engines. 

b) Explain the reasons for using a vee configuration engine in a motorcycle.
6 a) Identify the type of rear axle arrangement shown in Figure 3. (1 mark)

![Figure 3](http://jonesandblount.com/category/uncategorized/)

b) State the type of vehicle the axle arrangement in Figure 3 is fitted to. (1 mark)

c) Explain why multiple axles are used on this type of vehicle. (4 marks)
7 Explain the operating principle of an electric motor.

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(4 marks)
8   a) Identify the **two** components arrowed A and B in Figure 4. (2 marks)

![Figure 4](image)

b) Explain the purpose of the following heavy goods vehicle braking system components.
   i) Air compressor. (2 marks)

   ii) Brake actuator. (2 marks)
9 a) Identify the tool in Figure 5 and give **two** examples of its use. (3 marks)

Source: https://www.powertoolwarehouse.co.uk/

![Figure 5](https://www.powertoolwarehouse.co.uk/

b) Explain how to measure brake disc run-out. (4 marks)
A customer is considering purchasing a light vehicle and is unsure whether to choose a compression ignition (CI) or spark ignition (SI) power unit. Produce a report on the key features of each power unit type. In your report, include comparisons of compression ratios for both types and justify your recommendations.