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City & Guilds

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. ➡ 0 0
- 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.

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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)

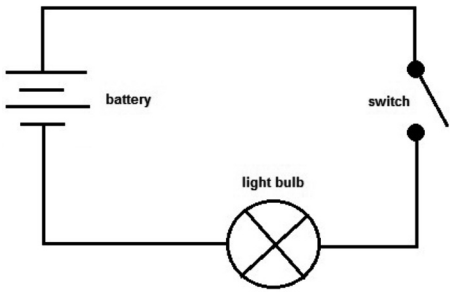
Source: https://www.shutterstock.com/image-photo/auto-mechanic-uses

Figure 1

ii) State what electrical unit is being measured. (1 mark)

See next page

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)

Current = Power ÷ Voltage

4 a) State **three** purposes of a battery. (3 marks)

b) Explain the advantages of fitting Light Emitting Diode (LED) headlamps to vehicles. (3 marks)

5 a) State **two** reasons why four stroke compression ignition engines are used in heavy goods vehicle engines. (2 marks)

b) Explain the reasons for using a vee configuration engine in a motorcycle. (2 marks)

See next page

6 a) Identify the type of rear axle arrangement shown in Figure 3. (1 mark)

Source: http://jonesandblount.com/category/uncategorized/

Figure 3

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. (4 marks)

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

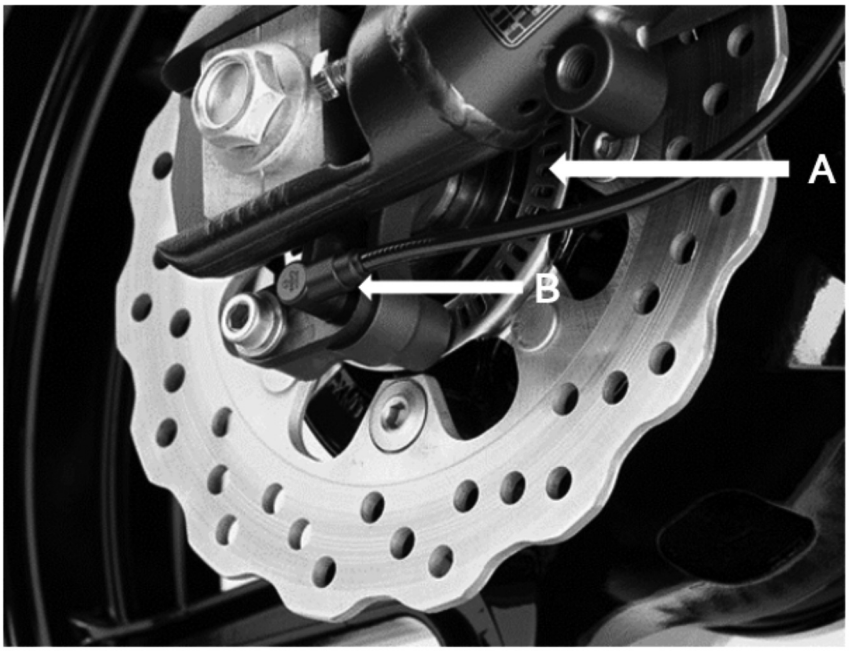


Figure 4

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

b) Explain how to measure brake disc run-out. (4 marks)

10 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. (12 marks)

End of assessment