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4292-530 MARCH 2019
Level 3 Technicals in the Automotive Industry
Level 3 Automotive Industry – Theory Exam (1)

If provided, stick your candidate barcode label here.

Friday 15 March 2019
09:30 – 12:00

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
- a non-programmable calculator

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 19 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) Explain the meaning of the term 'Thermosetting plastic'. (3 marks)

b) Name **two** types of thermosetting plastic materials. (2 marks)

2 Describe how a laminated glass screen is constructed. (2 marks)

3 a) Explain the advantages of using carbon fibre in vehicle suspension construction compared to using mild steel. (3 marks)

b) State the melting point of

i) cast iron (1 mark)

ii) mild steel. (1 mark)

4 Name the **two** types of gas shielded arc-welding processes used in vehicle construction or repair. (2 marks)

5 Identify the test equipment in Figure 1. (2 marks)

Source: www.eurocarparts.com

Figure 1

6 State **four** legislative requirements (Regulations) that apply to personal safety when in the workplace. (4 marks)

7 Name **two** UK legal requirements that apply to vehicles operating on the public highway. (2 marks)

See next page

8 Explain the method used to carry out systematic inspections on a light vehicle hydraulic steering system and components. (6 marks)

9 a) Identify the component in Figure 2. (1 mark)

Source: https://www.quora.com

Figure 2

b) Name the component parts labelled

i) A (1 mark)

ii) B (1 mark)

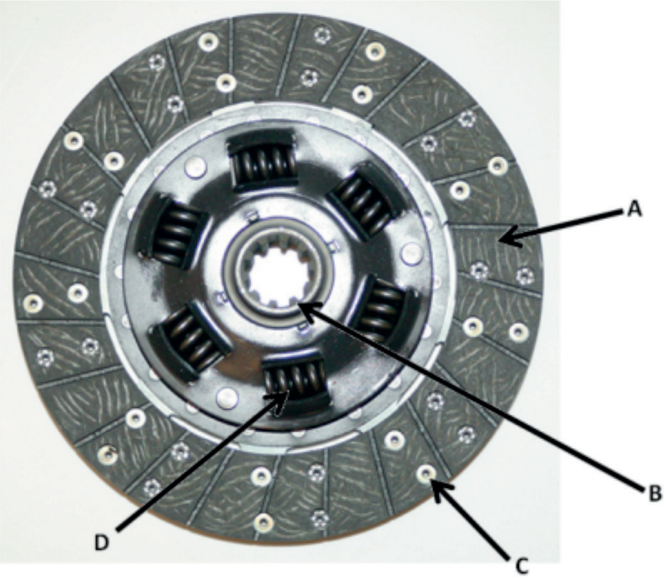
iii) C. (1 mark)

10 a) Explain the term 'Compression ratio'. (3 marks)

b) Calculate the compression ratio using the following data: swept volume 450 cm^3 and a clearance volume of 55 cm^3.

Show working out and formula. Give answer to 2 decimal points. (3 marks)

11 Identify and explain the purpose of items labelled A-D in Figure 3. (8 marks)



Source: www.superformance.co.uk

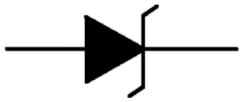
Figure 3

12 Identify the component in Figure 4 and state its purpose. (2 marks)

Source: www.rimmerbros.co.uk

Figure 4

13 a) Name the component represented by the symbol in Figure 5. (1 mark)

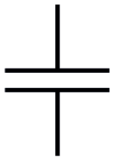


Source: http://ecetutorials.com

Figure 5

b) Explain the **main** functions of the component named in 13a. (2 marks)

c) Identify the component represented by the symbol in Figure 6 and state its function. (2 marks)



Source: https://commons.wikimedia.org

Figure 6

See next page

14 Differentiate between 'RAM' and 'ROM' in regards to computers. (5 marks)

15 a) State the formula for calculating Current flow using Ohms Law. (1 mark)

b) State the formula for calculating Watts using Ohms Law. (1 mark)

16 Name **three** different types of circuit protection used in vehicle electrical systems. (3 marks)

17 Resistances of the following values are connected in Series – 2 Ohms, 3 Ohms and 6 Ohms.

Calculate the total resistance in a 12 Volt circuit.
(Show the formula used) (2 marks)

18 Name **three** different types of computer programming language. (3 marks)

19 Discuss the differences between manual and automatic selection gearboxes. In your answer, consider the different applications, operating principles, design and maintenance requirements. (12 marks)

End of examination