

Automotive

General Instructions

- Reading time – 5 minutes
- Working time – 2 hours
- Write using black or blue pen
Black pen is preferred
- Board-approved calculators may be used
- Write your Centre Number and Student Number at the top of pages 9, 11 and 13

Total marks – 80

Section I Pages 2–6

15 marks

- Attempt Questions 1–15
- Allow about 20 minutes for this section

Section II Pages 9–14

35 marks

- Attempt Questions 16–21
- Allow about 50 minutes for this section

Section III Page 15

15 marks

- Attempt Question 22
- Allow about 25 minutes for this section

Section IV Page 16

15 marks

- Attempt Question 23
- Allow about 25 minutes for this section

Section I

15 marks

Attempt Questions 1–15

Allow about 20 minutes for this section

Use the multiple-choice answer sheet for Questions 1–15.

- 1** Why must care be taken when working on components that may contain asbestos?
- (A) It is difficult to wash off hands.
 - (B) It is flammable near naked flames.
 - (C) It may cause health issues if inhaled.
 - (D) It creates dust that may damage paint work.
- 2** A worker requires information on the appropriate storage, handling and use of a recently purchased chemical.
- To which document should they refer?
- (A) Code of practice
 - (B) Workshop manual
 - (C) Safe operating procedure
 - (D) Material safety data sheet
- 3** Which step should be taken before working on the fuel supply in an electronic fuel injection system?
- (A) Disconnect the battery
 - (B) Relieve the line pressure
 - (C) Remove the pressure regulator
 - (D) Disconnect the electronic control unit

- 4 Which of the following is responsible for determining workshop evacuation procedures?
- (A) Local council
 - (B) WorkCover NSW
 - (C) Safety committee
 - (D) Environment Protection Authority

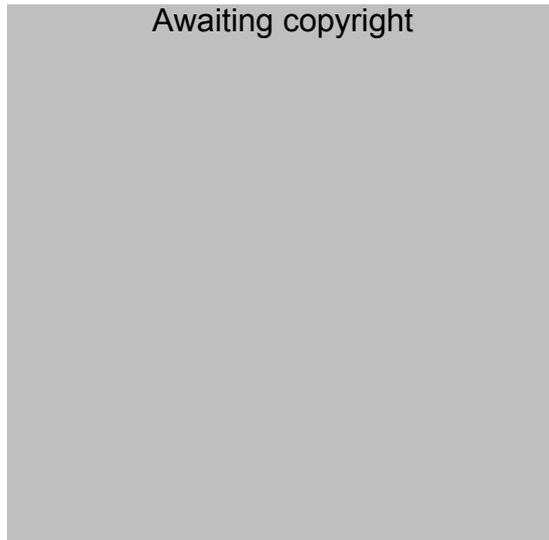
- 5 A micrometer is shown.



What is the reading on the micrometer?

- (A) 5.88
- (B) 7.38
- (C) 7.88
- (D) 52.38

6 An engine configuration is shown.



What is the name of this type of engine configuration?

- (A) Wankel rotary
- (B) Common-rail diesel
- (C) Horizontally opposed
- (D) Reed valve two-stroke

7 What is moving when current flows through a conductor?

- (A) Atoms
- (B) Protons
- (C) Neutrons
- (D) Electrons

8 When talking to a customer, a worker paraphrases the customer's inquiry and clarifies details of the conversation.

What form of communication is the worker demonstrating?

- (A) Active listening
- (B) Passive listening
- (C) Open questioning
- (D) Closed questioning

9 Which reference would you use to determine the specific lift points for raising a car on a two-post hoist?

- (A) Owner's manual
- (B) Compliance plate
- (C) Workshop manual
- (D) Under bonnet information

10 An internal thread has been cross-threaded on a cylinder block and requires repair.

Which repair method would be the most effective in restoring the thread to operate with the original sized bolt?

- (A) Run a tap through the hole
- (B) Apply metal putty and re-tap
- (C) Apply thread lock to bolt and tighten
- (D) Drill out to oversize and use thread insert

11 What is being measured when a hydrometer is used to test a lead acid battery?

- (A) Actual density
- (B) Specific density
- (C) Relative density
- (D) Gravitational density

12 An apprentice believes she is being underpaid by her employer.

Who should the apprentice contact to resolve the matter?

- (A) WorkCover NSW
- (B) NSW Fair Trading
- (C) Fair Work Ombudsman
- (D) Motor Traders Association

- 13** What problem may occur when using a fuel that has a lower octane rating than specified by the vehicle's manufacturer?
- (A) Over revving
 - (B) Engine detonation
 - (C) Oxygen sensor malfunction
 - (D) Catalytic converter damage
- 14** What current will a 60 watt, 12 volt bulb draw?
- (A) 0.5 amps
 - (B) 5 amps
 - (C) 48 amps
 - (D) 72 amps
- 15** The compression ratio of an engine is the ratio between the total volume above the piston at bottom dead centre (BDC) and the
- (A) swept volume.
 - (B) cylinder volume.
 - (C) total engine volume.
 - (D) combustion chamber volume.

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Centre Number

Section II

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Student Number

35 marks

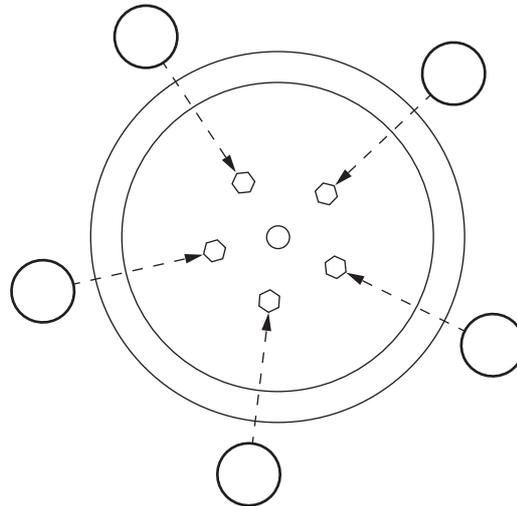
Attempt Questions 16–21

Allow about 50 minutes for this section

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 16 (7 marks)

- (a) Write numbers in the five circles to indicate the sequence for tightening the wheel nuts. 1



- (b) What tool should be used to tighten the wheel nuts? Justify your response. 2

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Question 16 continues on page 10

Question 16 (continued)

- (c) Outline the procedure for using a floor jack to raise and secure a vehicle for work. 4

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End of Question 16

Question 17 (6 marks)

When attempting to start a vehicle, you hear a continuous clicking sound when the ignition key is held in the crank position.

- (a) Which component is likely to be causing this condition? Justify your response. 2

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- (b) Select tools and outline procedures you would use to diagnose this condition and isolate the cause of the fault. 4

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Centre Number

Section II (continued)

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Student Number

Question 18 (6 marks)

A neighbour has complained about excessive noise from an automotive workshop.

- (a) What communication strategies could the workshop manager use when discussing the complaint with the neighbour? **3**

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- (b) What control measures could be implemented to reduce the impact of the noise on the neighbour? **3**

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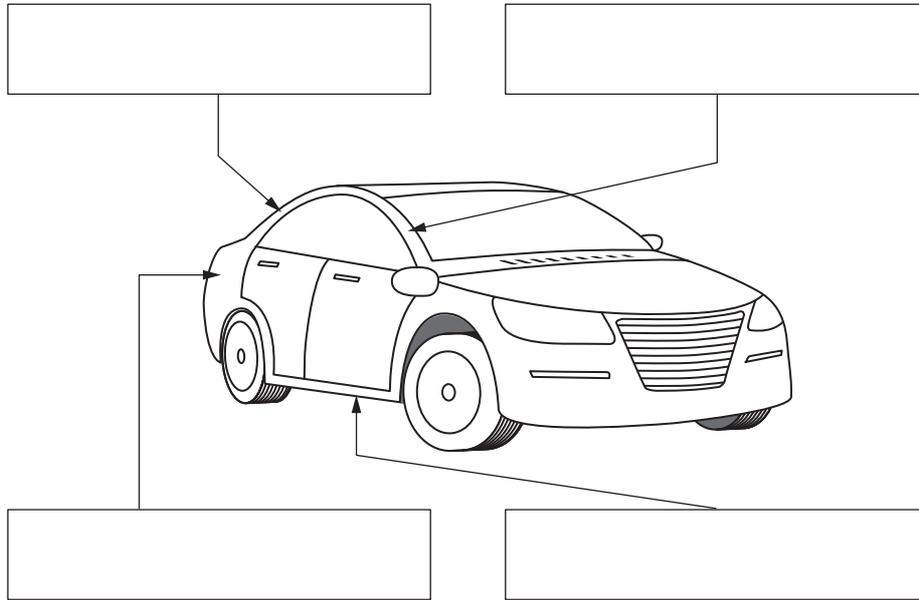
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Question 19 (6 marks)

- (a) Using correct automotive terminology, identify the components indicated on the diagram.

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- (b) Explain how improving body component design relates to improved fuel efficiency and safety.

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Centre Number

Section II (continued)

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Student Number

Question 20 (4 marks)

A customer asks for two complete 100 watt driving lamps to be installed as an accessory. **4**

Select and justify the components and equipment needed to fit and connect these driving lamps.

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Question 21 (6 marks)

(a) What is a hybrid vehicle? **1**

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(b) Explain how energy is captured and stored in a hybrid vehicle. **5**

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Automotive

Section III

15 marks

Attempt Question 22

Allow about 25 minutes for this section

Answer the question in a writing booklet. Extra writing booklets are available.

In your answer you will be assessed on how well you:

- demonstrate knowledge and understanding relevant to the question
 - communicate ideas and information using relevant workplace examples and industry terminology
 - present a logical and cohesive response
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Question 22 (15 marks)

Describe issues currently facing the Australian automotive manufacturing industry and how these issues may affect other related industries.

Please turn over

Section IV

15 marks

Attempt Question 23

Allow about 25 minutes for this section

Answer the question in a SEPARATE writing booklet. Extra writing booklets are available.

Question 23 (15 marks)

- (a) Why are diesel engines increasing in popularity? **3**
- (b) Outline the differences between a diesel engine and a petrol engine. **4**
- (c) Describe new technologies that are being applied to diesel operating systems. **8**

End of paper