

B O A R D O F S T U D I E S
NEW SOUTH WALES

2009

**HIGHER SCHOOL CERTIFICATE
EXAMINATION**

Automotive

General Instructions

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

Total marks – 80

Section I Pages 2–5

15 marks

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

Section II Pages 9–15

35 marks

- Attempt Questions 16–21
- Allow about 45 minutes for this section

Section III Page 17

30 marks

- Attempt TWO questions from Questions 22–24
- Allow about 1 hour for this section

Section I

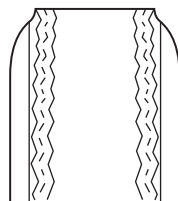
15 marks

Attempt Questions 1–15

Allow about 15 minutes for this section

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

- 1 Which of the following should be the first option to loosen a frozen/rusted screw?
- (A) Heat with an oxyacetylene flame
 - (B) Grind off the head, drill and easy-out
 - (C) Use an impact driver and hammer
 - (D) Use a centre punch and hammer to turn the screw
- 2 The glass envelope of a new quartz halogen headlight globe is covered in a protective sleeve to prevent
- (A) damage if it is dropped.
 - (B) the glass tarnishing while in storage.
 - (C) moisture build-up causing premature failure.
 - (D) hands touching the glass and causing premature failure.
- 3 A tyre shows excessive wear in the centre of the tread as shown.



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What is the most likely cause of this?

- (A) Over-inflation
- (B) Under-inflation
- (C) Poor rotation schedule
- (D) Steering misalignment

- 4 A red diamond in the centre of the number plate indicates that the vehicle
- (A) is owned and registered by the Commonwealth government.
 - (B) is a commercial vehicle, permitted to park in a loading zone.
 - (C) has liquid petroleum gas (LPG) fitted.
 - (D) is a registered taxi or hire car.
- 5 What is the correct method for disposal of trade waste water from an automotive workshop?
- (A) Discharge it into the sewer after treatment
 - (B) Pour it onto a suitable grassed area after treatment
 - (C) Discharge it into the stormwater drain after treatment
 - (D) Store it in a sealed container and place in an industrial waste bin
- 6 What correct safety procedure should you follow if an electric power tool has a frayed lead?
- (A) Report it to your supervisor and attach a fault tag.
 - (B) Immediately tape up the damaged lead with insulation tape.
 - (C) Report it to your supervisor, but if it is a double-insulated tool it is safe to use.
 - (D) Continue to use it, provided it is connected to an earth leakage breaker (ELB).
- 7 What is the primary purpose of a fuse in an electrical circuit?
- (A) To allow the current to flow into the circuit
 - (B) To protect the circuit against excessive current flow
 - (C) To ensure the current is maintained at the correct amperage
 - (D) To ensure continued current flow in the event of a short circuit

- 8** Where would you find detailed information about hazardous materials used in a workshop?
- (A) WorkCover Authority
 - (B) Material Safety Data Sheet (MSDS)
 - (C) Hazardous Materials Unit (HAZMAT)
 - (D) Environment Protection Authority (EPA)
- 9** Which of the following would be the best practice procedure in making a diagnosis of a problem?
- (A) Substitute a component to clearly identify the fault
 - (B) Understand exactly what the owner says and wants
 - (C) Use a systematic approach and follow a logical sequence
 - (D) Ask a work colleague for information to draw conclusions from
- 10** Which of the following is the correct sequence of steps in charging a flat battery?
- (A) Switch charger on, connect negative charger lead, connect positive charger lead
 - (B) Connect positive charger lead, connect negative charger lead, switch charger on
 - (C) Connect negative charger lead, switch charger on, connect positive charger lead
 - (D) Connect negative charger lead, connect positive charger lead, switch charger on
- 11** Before a person works under a vehicle that has been raised with a floor jack, they should ensure that they
- (A) wear the correct personal protective equipment (PPE).
 - (B) correctly position the jack on a nominated jacking point.
 - (C) follow the correct occupational health and safety (OHS) procedures for jacking.
 - (D) support the vehicle using jack stands with the correct safe weight loading (SWL).
- 12** When finding the cause of an electrical fault, what are the essential requirements of a good diagnosis?
- (A) Investigation, research, testing and experimentation
 - (B) Knowledge, research, analysis and decision
 - (C) Analysis, elimination and experimentation
 - (D) Testing, substitution and elimination

- 13** Which of the following is a feature of active listening?
- (A) Note-taking while carefully listening
 - (B) Facing the speaker and quietly listening
 - (C) Nodding your head after every sentence
 - (D) Asking questions and providing feedback
- 14** A customer took a car to have a mechanical problem fixed. The technician asked several questions.
- Which one of the following is an open question?
- (A) When did you last refuel the vehicle?
 - (B) Has the car had a similar problem to this before?
 - (C) What other information can you give me about the problem?
 - (D) Where and when did you have your last service done?
- 15** Which of the following best describes the role of the Environment Protection Authority (EPA)?
- (A) To ensure sustainability, profitability and business growth
 - (B) To uphold ethical values relating to environmental protection
 - (C) To monitor and control the management of environmental issues based on government policies
 - (D) To enforce workplace recycling for the improvement of environmental sustainability

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Centre Number

Section II

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Student Number

35 marks

Attempt Questions 16–21

Allow about 45 minutes for this section

Answer the questions in the spaces provided.

Question 16 (6 marks)

There are a number of chemicals and hazardous products used in the automotive industry.

What are the THREE ways that chemical/hazardous products can enter the human body? Explain in each case how you would protect yourself from this happening.

(i) 2

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(ii) 2

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(iii) 2

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Question 17 (6 marks)

You are required to telephone an automotive parts supplier to order a replacement front bumper bar for a vehicle.

- (a) Before making the call, list FOUR important pieces of information that you should have from the vehicle. **4**

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- (b) The parts supplier has provided the part number and price. **2**

What are TWO questions that you should ask the parts supplier to allow you to plan your repair schedule?

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Question 18 (8 marks)



- (a) Complete the table below, naming each numbered component and describing its function.

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Name	Function
1.	
2.	
3.	
4.	
5.	

Question 18 continues on page 12

Question 18 (continued)

- (b) A customer complains that the car battery is constantly running flat.

3

In the table below, list **THREE** possible faults in the charging system that could be causing the problem. Name the test that you would perform for each fault identified.

Possible fault	Test to perform

End of Question 18

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Centre Number

Section II (continued)

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Student Number

Question 19 (7 marks)

- (a) Why is it recommended that the earth lead be removed first and replaced last when disconnecting or connecting an automotive battery? **1**

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- (b) What does CCA refer to in an automotive battery? **1**

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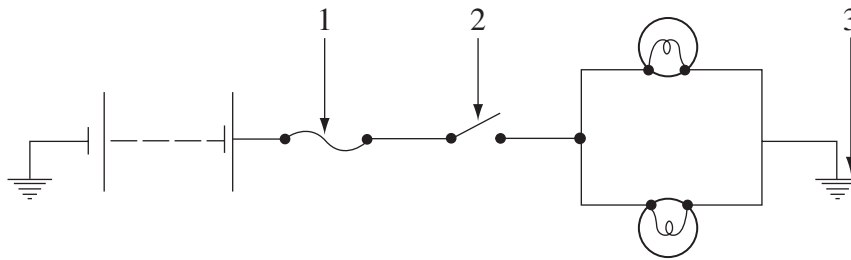
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Question 19 continues on page 14

Question 19 (continued)

(c) This diagram shows some components in an electrical circuit.

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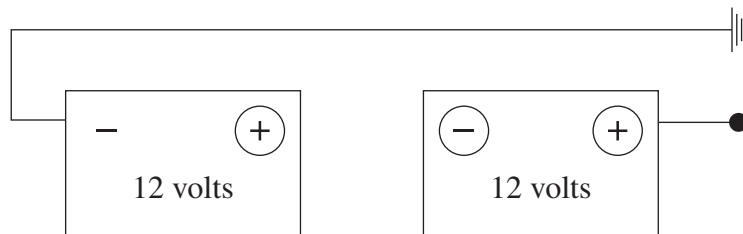


Complete the table naming and describing the function of each numbered component.

Component	Name	Function
1		
2		
3		

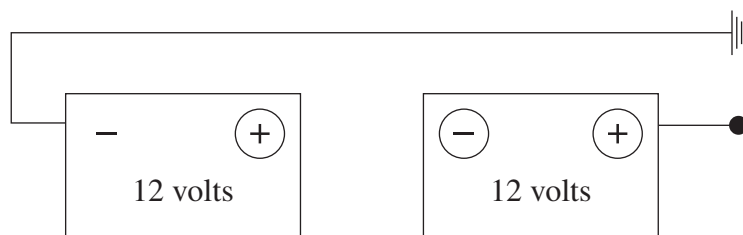
(d) In the diagram below, draw lines to show how to connect the terminals to increase battery output voltage to 24 volts.

1



(e) In the diagram below, draw lines to show how to connect the terminals to maintain battery output voltage at 12 volts.

1



End of Question 19

Question 20 (5 marks)

Describe the role of WorkCover NSW in relation to the automotive industry.

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Question 21 (3 marks)

There are a number of industry bodies associated with the automotive industry.

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Give the full name of ONE industry body and describe its primary role.

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Automotive

Section III

30 marks

Attempt TWO questions from Questions 22–24

Allow about 1 hour for this section

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

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

- demonstrate relevant knowledge and understanding
 - communicate ideas and information, using precise industry terminology and appropriate workplace examples
 - organise information in a well-reasoned and cohesive response
 - solve proposed issues or problems
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Question 22 (15 marks)

The Automotive Retail Services and Repair industry is divided into many sectors, for example; manufacturers and motor vehicle dealers.

Describe the role and services offered by any THREE sectors of the industry and discuss the inter-relationships between them.

Question 23 (15 marks)

Identify FIVE hazardous materials used in an automotive workshop.

Explain how these hazards can be managed in the workplace to meet current environmental regulations.

Question 24 (15 marks)

In the automotive workplace, communication occurs in written, verbal and non-verbal ways.

Evaluate the importance of the effective use of each of these types of communication in a workshop environment.

End of paper

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