



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

**2012**

**HIGHER SCHOOL CERTIFICATE  
EXAMINATION**

# Industrial Technology

## Automotive Technologies

### General Instructions

- Reading time – 5 minutes
- Working time –  $1\frac{1}{2}$  hours
- Write using black or blue pen  
Black pen is preferred
- Draw diagrams using pencil
- Board-approved calculators may be used
- Write your Centre Number and Student Number at the top of page 5

**Total marks – 40**

**Section I** Pages 2–4

**10 marks**

- Attempt Questions 1–10
- Allow about 20 minutes for this section

**Section II** Pages 5–7

**15 marks**

- Attempt Questions 11–15
- Allow about 35 minutes for this section

**Section III** Page 9

**15 marks**

- Attempt Question 16
- Allow about 35 minutes for this section

## Section I

10 marks

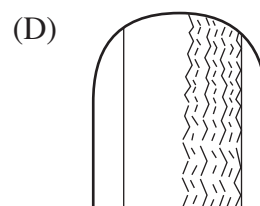
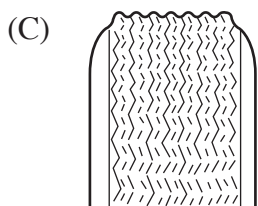
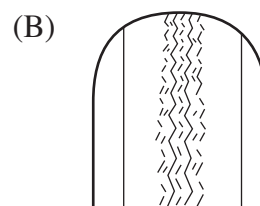
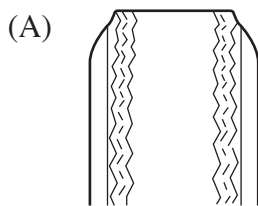
Attempt Questions 1–10

Allow about 20 minutes for this section

Use the multiple-choice answer sheet for Questions 1–10.

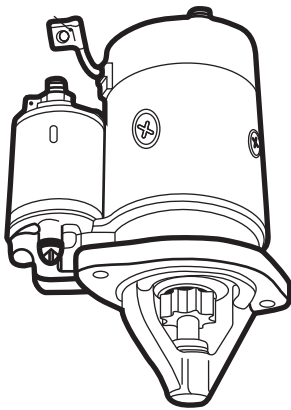
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- 1 What is the capacity of one cylinder in a 3.6-litre V6 engine?
- (A) 0.6 L  
(B) 1.2 L  
(C) 1.8 L  
(D) 3.6 L
- 2 What is the correct sequence in the Otto Four-Stroke Cycle engine?
- (A) Compression → Exhaust → Induction → Power  
(B) Compression → Power → Induction → Exhaust  
(C) Induction → Compression → Power → Exhaust  
(D) Induction → Power → Exhaust → Compression
- 3 Which diagram illustrates tyre wear caused by camber?



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4 Which component of an ignition system is shown in the diagram?



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- (A) Coil
  - (B) Distributor
  - (C) Generator
  - (D) Starter motor
- 5 What is the function of cooling fins on air-cooled engines?
- (A) To control the coolant
  - (B) To dissipate engine heat
  - (C) To cool the radiator water
  - (D) To direct air onto the radiator
- 6 The flywheel of an internal combustion engine maintains the smooth rotary motion of the
- (A) camshaft.
  - (B) crankshaft.
  - (C) gearbox.
  - (D) rear wheels.

- 7 What is reduced if a lower gear is engaged when going down a steep hill?
- (A) Tyre wear
  - (B) Engine revolutions
  - (C) Overheating of the brakes
  - (D) The load on the transmission
- 8 How many crankshafts does a V-type engine (eg V8, V12) have?
- (A) 1
  - (B) 2
  - (C) 3
  - (D) 4
- 9 Which of the following are components of disc brakes?
- (A) A caliper and a drum
  - (B) Brake pads and a rotor
  - (C) Brake shoes and a rotor
  - (D) A master cylinder and a drum
- 10 A car uses premium unleaded fuel which costs \$1.50 per litre. The car's fuel consumption is 12 litres per 100 km.
- What is the cost of petrol needed to travel 620 km, to the nearest dollar?
- (A) \$48
  - (B) \$78
  - (C) \$112
  - (D) \$180

# Industrial Technology Automotive Technologies

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Centre Number

## Section II

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Student Number

15 marks

Attempt Questions 11–15

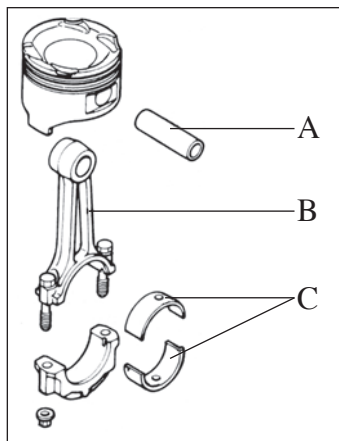
Allow about 35 minutes for this section

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

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### Question 11 (2 marks)

Name the THREE labelled components of the exploded view of the piston assembly shown. 2



A.....

B.....

C.....

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### Question 12 (3 marks)

Automotive components are often recycled or reused.

Identify one such component and outline why it is recycled or reused. 3

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**Question 13** (3 marks)

Outline a range of technologies that have improved motor vehicle occupant safety. **3**

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**Question 14** (3 marks)

Describe fault-finding checks that can help determine why an engine is not turning over. **3**

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**Question 15** (4 marks)

Describe the advantages of using liquid petroleum gas (LPG) in motor vehicles.

**4**

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# Industrial Technology

## Automotive Technologies

### Section III

**15 marks**

**Attempt Question 16**

**Allow about 35 minutes for this section**

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

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#### **Question 16** (15 marks)

A company is considering expanding its operations to take advantage of new and emerging web-based technologies.

- (a) Describe a range of web-based technologies the company could use to market and sell its goods and/or services. **5**
  
- (b) Describe the possible impact on both the work practices and the organisation of the company if web-based technologies were implemented. **10**

**End of paper**

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