

Industrial Technology

Automotive Technologies

General Instructions

- Reading time – 5 minutes
- Working time – 1½ 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.

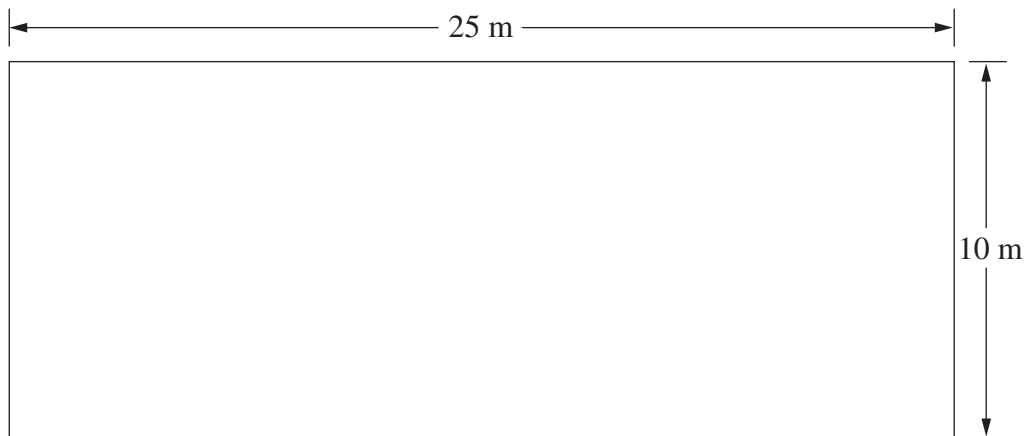
1 What is the name of the tool shown?



- (A) Pipe wrench
 - (B) Oil filter wrench
 - (C) Three jaw gear puller
 - (D) Adjustable socket wrench
- 2 What is indicated by vibration in the steering wheel when driving?
- (A) Incorrect camber
 - (B) Low tyre pressure
 - (C) Tyres not balanced
 - (D) Wheels out of alignment
- 3 What unit of measurement is used to calibrate a torque wrench?
- (A) amp
 - (B) Pa
 - (C) m/s^2
 - (D) Nm

- 4 What is the purpose of a wheel bearing?
- (A) To reduce friction on the wheel hub
 - (B) To slow down the wheel hub rotation speed
 - (C) To assist in tightening the wheel hub to the axle
 - (D) To keep dust and water out of the axle assembly
- 5 In which part of a vehicle is a needle valve located?
- (A) The clutch
 - (B) The carburettor
 - (C) The water pump
 - (D) The air conditioner
- 6 Which of the following is the most common battery type used in electric cars?
- (A) Daniell cell
 - (B) Lithium-ion
 - (C) Aluminium-ion
 - (D) Nickel metal hydride
- 7 What is the function of the ignition coil?
- (A) To store unused power
 - (B) To reduce battery voltage
 - (C) To increase battery voltage
 - (D) To maintain battery voltage

- 8 The dimensions of an automotive workshop are shown. 15 m^2 of its floor area is dedicated to storage.



- What percentage of the total floor area is dedicated to storage?
- (A) 6%
(B) 12%
(C) 60%
(D) 67%
- 9 Which of the following correctly shows the sequence of a four-stroke engine?
- (A) Compression → induction → exhaust → power
(B) Exhaust → compression → induction → power
(C) Induction → compression → power → exhaust
(D) Power → compression → induction → exhaust
- 10 A large automotive company pays for its workers' professional association fees. The fee is \$457 for a full-time tradesman and \$250 for a part-time tradesman. An apprentice fee is 48% of a part-time tradesman's fee.

How much does it cost the company if there are 137 full-time tradesmen, 22 part-time tradesmen and 27 apprentices?

- (A) \$65 849
(B) \$68 109
(C) \$71 349
(D) \$74 589



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.

Question 11 (1 mark)

Identify the device which is located on the fuel line that assists in the removal of contaminants from fuel. **1**

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Question 12 (3 marks)

Explain the function of a manifold absolute pressure (MAP) sensor. **3**

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Question 13 (3 marks)

Explain the purpose of differential gears in a rear-wheel drive vehicle.

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Question 14 (3 marks)

Outline the function of piston rings in an internal combustion engine.

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Question 15 (5 marks)

Explain how devices incorporated into new vehicles have improved safety. Give examples in your answer.

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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.

Question 16 (15 marks)

- (a) Describe the impact of government legislation on work practices. **6**
- (b) Evaluate the effect of new and emerging technologies on work practices in industry. **9**

End of paper

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