

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

2009

**HIGHER SCHOOL CERTIFICATE
EXAMINATION**

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Centre Number

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Student Number

Industrial Technology

Metals and Engineering Industries

General Instructions

- Reading time – 5 minutes
- Working time – $1\frac{1}{2}$ hours
- Write using black or blue pen
- Draw diagrams using pencil
- Board-approved calculators may be used
- Write your Centre Number and Student Number at the top of this page and pages 5, 7, 11 and 15

Total marks – 100

Section I Pages 2–9

60 marks

- Attempt Questions 1–3
- Allow about 55 minutes for this section

Section II Pages 11–17

40 marks

- Attempt Questions 4–5
- Allow about 35 minutes for this section

Section I

60 marks

Attempt Questions 1–3

Allow about 55 minutes for this section

Answer the questions in the spaces provided.

Use the following information to answer Questions 1–3.

Due to a slowing local and global economy, demand for IND-TECH’s products and services is decreasing. IND-TECH’s management has decided to investigate ways of maintaining sales.

Question 1 (20 marks)

(a) Name TWO strategies IND-TECH could consider to maintain sales. **2**

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(b) Outline possible changes IND-TECH could make to its management structure in order to improve the company’s efficiency. **3**

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Question 1 continues on page 3

Question 1 (continued)

- (c) Identify and describe a method IND-TECH could use to determine the reasons for the decrease in demand for their products and services. **4**

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- (d) IND-TECH is considering changes to their employee working hours. **4**

Discuss the impact that government legislation could have on this proposal.

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Question 1 continues on page 4

Question 1 (continued)

- (e) To improve efficiency, IND-TECH is considering implementing an emerging technology.

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Suggest an appropriate technology and analyse the possible impact of this technology on both the company and its employees.

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End of Question 1

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Student Number

Section I (continued)

Question 2 (20 marks)

- (a) List TWO forms of effective workplace communication. **2**

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- (b) Outline personnel issues that could arise if IND-TECH were to reduce its employees' working hours. **3**

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- (c) IND-TECH plans to train its employees to be multi-skilled. **4**

Discuss how management could ensure a safe working environment during the training.

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Question 2 continues on page 6

Question 2 (continued)

- (d) Describe TWO methods IND-TECH's management could use to determine the viability of introducing new products and services. 4

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- (e) Evaluate the use of computer software in the design and production of new products. 7

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End of Question 2

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Centre Number

Section I (continued)

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Student Number

Question 3 (20 marks)

- (a) List TWO advantages of using freehand drawings to present initial design ideas. **2**

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- (b) Why are graphics often used in OHS signage? Use an example to support your answer. **3**

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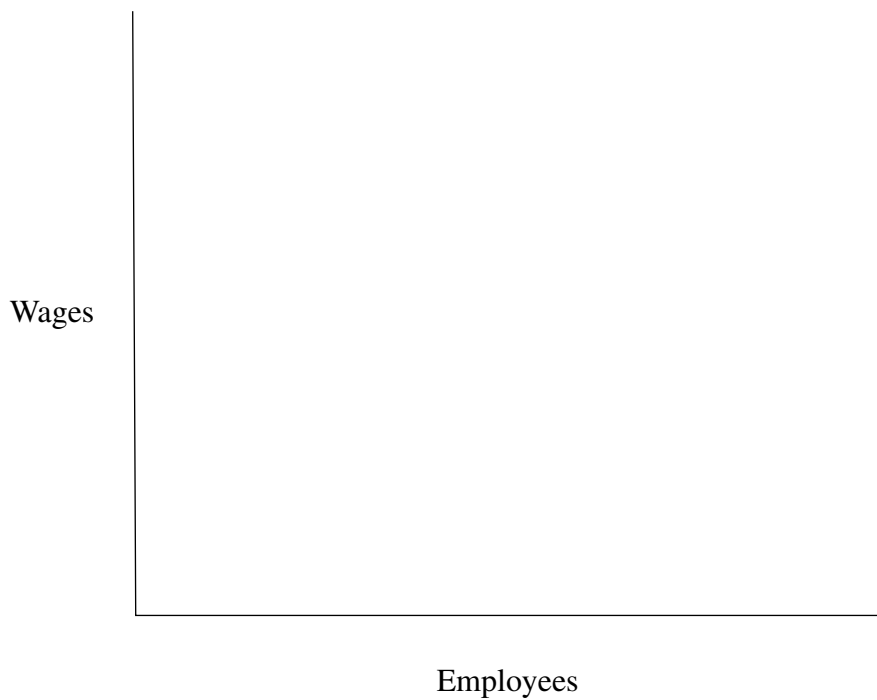
Question 3 continues on page 8

Question 3 (continued)

- (c) (i) Complete the following table to determine the weekly wages for a company. 2

<i>Employees</i>	<i>Number</i>	<i>Hourly rate (\$)</i>	<i>Hours worked</i>	<i>Weekly wages (\$)</i>
Administration staff	3	17	40	
Managers	2		40	4 400
Tradespeople		45	40	12 600
Apprentices	2	16		1 280
			<i>Total</i>	

- (ii) Using the information in the table, graph the weekly wages for each group of employees. 2



Question 3 continues on page 9

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Centre Number

Section II

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Student Number

40 marks

Attempt Questions 4–5

Allow about 35 minutes for this section

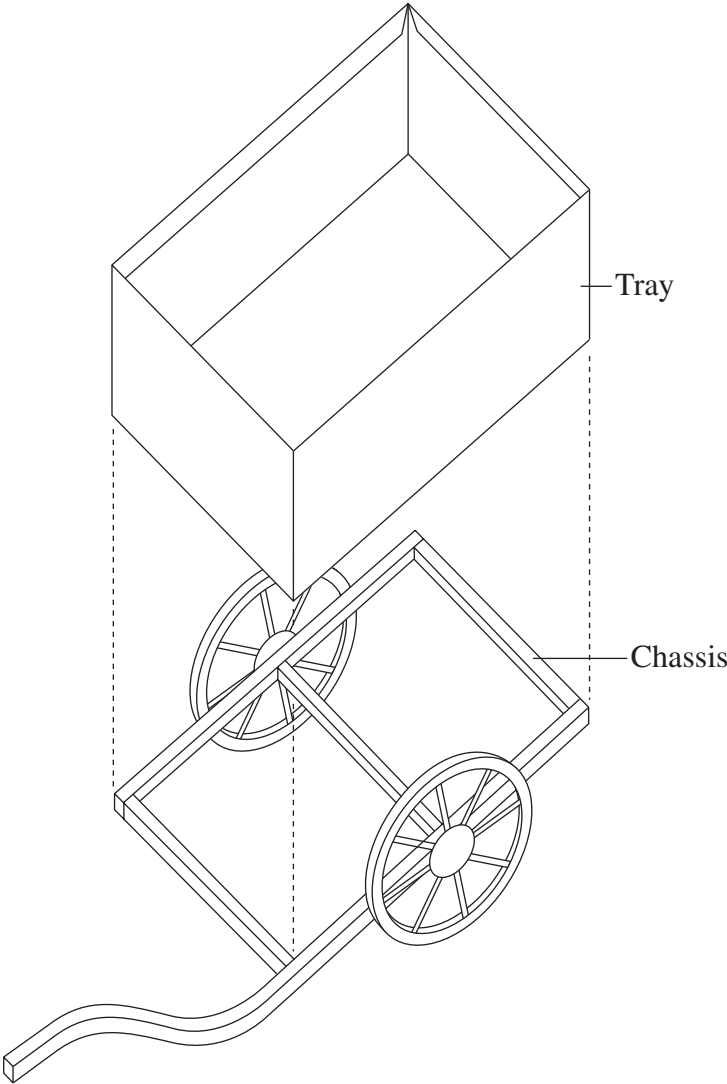
Answer the questions in the spaces provided.

Question 4 (20 marks)

Please turn over

Question 4 (20 marks)

A small trailer that can be attached to a bicycle is to be produced.



(a) What are TWO metals, other than mild steel, that can be used in the construction of the trailer tray?

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Question 4 continues on page 13

Question 4 (continued)

(b) Outline methods of applying a corrosion-resistant finish to mild steel components. **3**

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(c) How can the tray be fabricated from sheet metal? Include a sketch in your answer. **4**

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(d) Describe a suitable process for attaching the wheels to the chassis. **4**

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Question 4 continues on page 14

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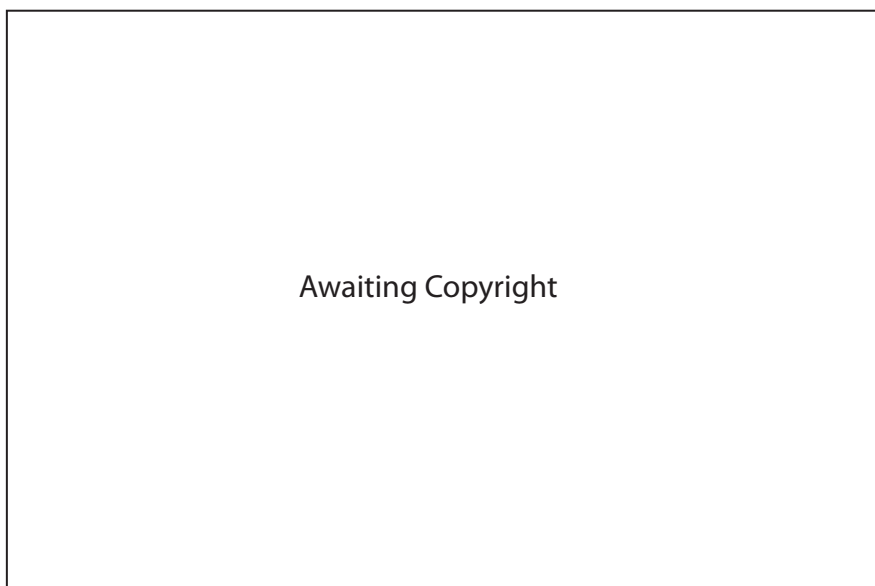
Section II (continued)

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Student Number

Question 5 (20 marks)

A diagram of a vice is shown.



- (a) What are TWO suitable industrial methods that can be used to cut the vice jaws from metal stock? 2

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Question 5 continues on page 16

Question 5 (continued)

- (b) Outline TWO methods that could be used to attach the handle caps to the handle. **3**

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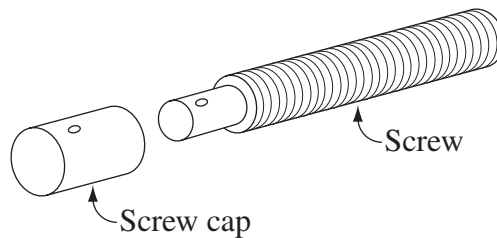
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- (c) Describe how the screw and the screw cap could be manufactured. **4**



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Question 5 continues on page 17

Question 5 (continued)

- (d) Outline the processes used to prepare the jaws and vice body before being assembled using M6 × 1 CSK screws. 4

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- (e) The body of the vice can be mass produced in cast iron or in mild steel. Discuss the processes involved for both materials. 7

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