

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

**2009**

**HIGHER SCHOOL CERTIFICATE  
EXAMINATION**

--	--	--	--	--

Centre Number

--	--	--	--	--	--	--	--	--	--

Student Number

# Industrial Technology

## Automotive 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**

.....  
.....

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

.....  
.....  
.....  
.....  
.....  
.....

**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**

.....

.....

.....

.....

.....

.....

.....

.....

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

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

.....

.....

.....

.....

.....

.....

.....

.....

**Question 1 continues on page 4**

Question 1 (continued)

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

7

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

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**End of Question 1**

**Industrial Technology  
Automotive Industries**

--	--	--	--	--

Centre Number

**Section I (continued)**

--	--	--	--	--	--	--	--	--

Student Number

**Question 2 (20 marks)**

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

.....  
.....

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

.....  
.....  
.....  
.....  
.....  
.....

- (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.

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**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

.....

.....

.....

.....

.....

.....

.....

.....

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

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**End of Question 2**

Industrial Technology  
Automotive Industries

--	--	--	--	--

Centre Number

Section I (continued)

--	--	--	--	--	--	--	--	--

Student Number

**Question 3** (20 marks)

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

.....  
.....

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

.....  
.....  
.....  
.....  
.....  
.....

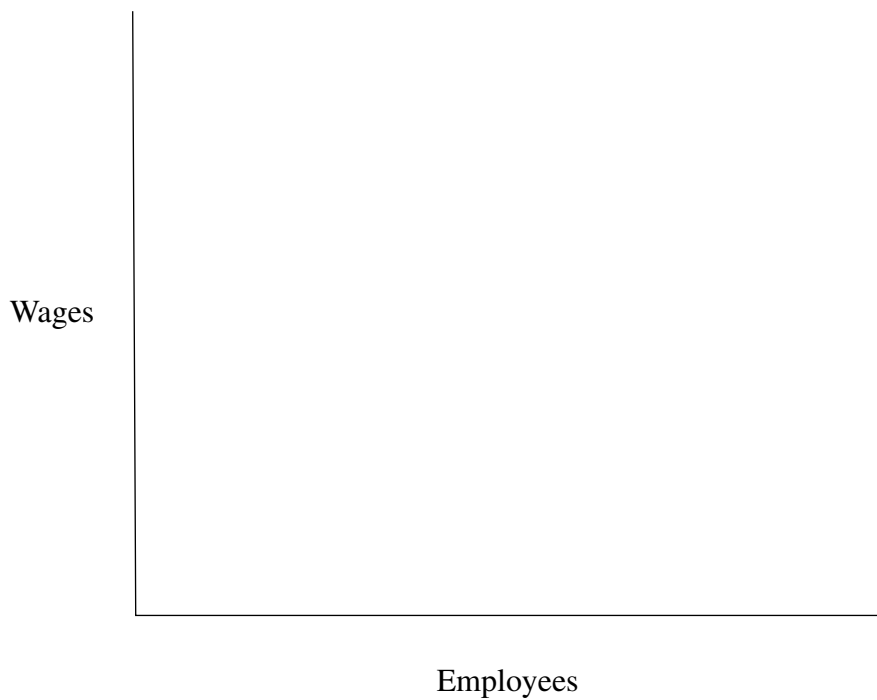
**Question 3 continues on page 8**

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**

Question 3 (continued)

- (d) Describe the advantages of using word processing software to produce a management folio. **4**

.....

.....

.....

.....

.....

.....

.....

.....

- (e) Identify and evaluate the types of computer graphics that could be used in the production of IND-TECH's annual report. **7**

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**End of Question 3**

BLANK PAGE

**Industrial Technology  
Automotive Industries**

--	--	--	--	--

Centre Number

--	--	--	--	--	--	--	--	--

Student Number

**Section II**

**40 marks**

**Attempt Questions 4–5**

**Allow about 35 minutes for this section**

Answer the questions in the spaces provided.

---

**Question 4** (20 marks)

- (a) Why is an oil change a routine maintenance procedure? **2**

.....

.....

.....

.....

- (b) Outline the principles of the operation of a vehicle powered by both a petrol engine and an electric motor. **3**

.....

.....

.....

.....

.....

.....

**Question 4 continues on page 12**

Question 4 (continued)

- (c) Discuss the advantages and disadvantages of using diesel engines in modern motor vehicles. **4**

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

- (d) Describe the process of securing a cylinder head to an engine block. In your answer, refer to the tools used. **4**

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**Question 4 continues on page 13**

Question 4 (continued)

- (e) Explain how an engine cooling system operates in a motor vehicle. In your answer, identify key components and include a sketch.

7

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**End of Question 4**

BLANK PAGE

**Industrial Technology  
Automotive Industries**

--	--	--	--	--

Centre Number

**Section II (continued)**

--	--	--	--	--	--	--	--	--

Student Number

**Question 5 (20 marks)**

- (a) List TWO routine maintenance procedures that can be used to prolong the life of tyres on a vehicle. **2**

.....  
.....

- (b) Outline the difference in the operation of a drum brake and a disc brake. In your answer, include a sketch. **3**

.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....  
.....

**Question 5 continues on page 16**

Question 5 (continued)

- (c) Discuss the reasons why panel repair is now becoming obsolete and panel replacement more common. **4**

.....

.....

.....

.....

.....

.....

.....

.....

- (d) Explain the importance of complying with government and statutory regulations in any vehicle modification. In your answer, include an example. **4**

.....

.....

.....

.....

.....

.....

.....

.....

**Question 5 continues on page 17**

Question 5 (continued)

- (e) Explain how advances in automotive design have improved the safety, aerodynamics and environmental impact of modern motor vehicles. Use examples to illustrate your answer.

7

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

**End of paper**

BLANK PAGE