

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

**2004**

**HIGHER SCHOOL CERTIFICATE  
EXAMINATION**

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Centre Number

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Student Number

# Industrial Technology

## Building and Construction 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, 9, 13 and 17

### Total marks – 100

**Section I** Pages 2–12

#### 60 marks

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

**Section II** Pages 13–20

#### 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.

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**Marks**

IND-TECH is a company in the building and construction industry employing a mix of male and female employees. Management has decided to investigate the viability of introducing new technologies to stimulate productivity and expansion in the market.

**Question 1 (20 marks)**

(a) Identify an example of a new technology that IND-TECH could investigate. **1**

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(b) Outline the implications of the introduction of new technologies on IND-TECH’s existing technologies. **3**

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**Question 1 continues on page 3**

Question 1 (continued)

- (c) Describe ways in which IND-TECH’s management could evaluate the viability of introducing new technologies. 4

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- (d) Explain how the introduction of new technologies could stimulate IND-TECH’s productivity. 4

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**Question 1 continues on page 4**

Question 1 (continued)

- (e) Propose and justify ways in which IND-TECH could measure the efficiency of new technologies after they have been introduced. **8**

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**End of Question 1**

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**Section I (continued)**

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**Marks**

**Question 2 (20 marks)**

- (a) Identify sources of finance that IND-TECH may use to support the introduction of the new technologies. **2**

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- (b) Outline possible changes to the production manager’s responsibilities when new technologies are introduced. **2**

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**Question 2 continues on page 6**

Question 2 (continued)

- (c) The introduction of new technologies may enhance IND-TECH’s position in the product market. 4

Discuss how the introduction of new technologies could improve the marketability of IND-TECH’s products.

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- (d) As a result of the introduction of new technologies, a number of IND-TECH’s employees are identified as being redundant and are to be dismissed. 4

Outline the industrial rights of these employees, and identify appropriate action that can be taken by them.

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**Question 2 continues on page 7**

Question 2 (continued)

- (e) IND-TECH’s management proposes to retrain their female employees to be specialist users of the new technologies. 8

Analyse this proposal and discuss the responsibilities of IND-TECH’s management towards all its employees.

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**End of Question 2**

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Section I (continued)

Question 3 (20 marks)

Marks

- (a) Identify the sign shown and state how IND-TECH's employees should respond to it. 2



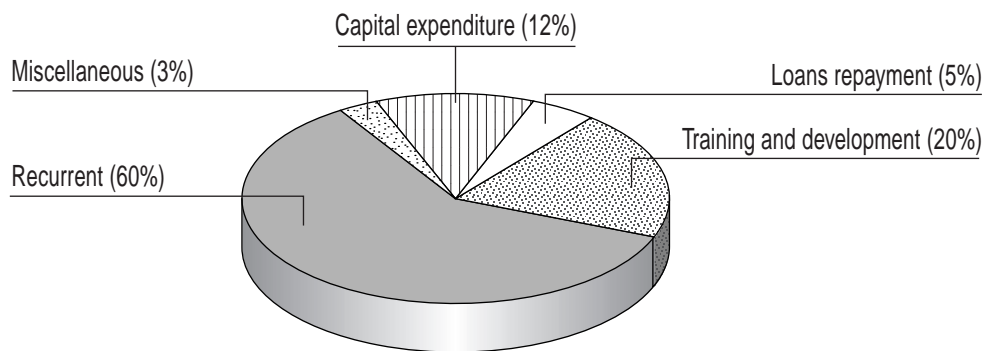
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- (b) The graph shows IND-TECH's expenditure in the year following the introduction of the new technologies. 2



Identify reasons for the proportion being spent on training and development.

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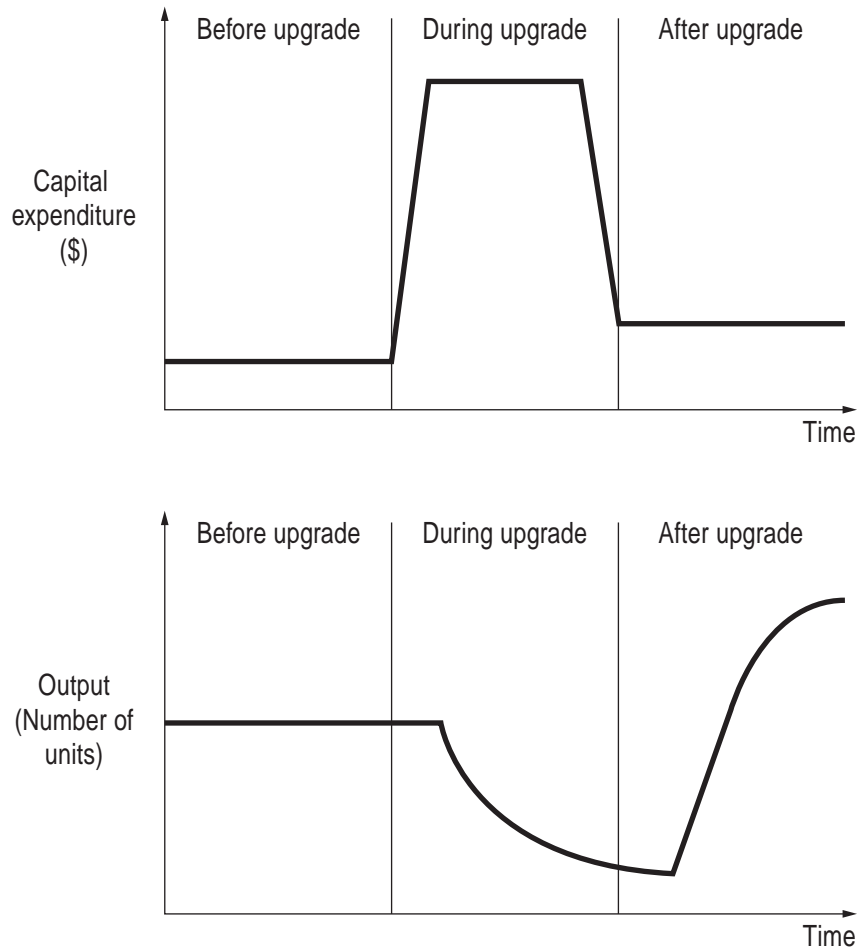
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Question 3 continues on page 10

Question 3 (continued)

- (c) The graphs below illustrate IND-TECH's capital expenditure and output before, during and after the introduction of new technologies. 4



Explain the reasons for the changes in capital expenditure and output during and after the upgrade phases.

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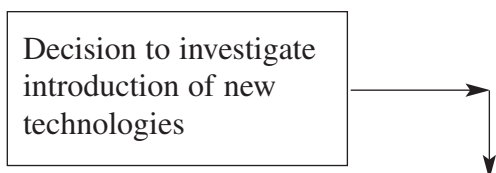
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Question 3 continues on page 11

Question 3 (continued)

- (d) Complete the diagram to show a sequence plan for the introduction of the new technologies at IND-TECH. 4

**Introduction of new technologies plan**



**Question 3 continues on page 12**

Question 3 (continued)

- (e) With the introduction of new technologies, IND-TECH proposes to use an external agency to assess the possible changes to the work environment.

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Outline the issues that could be identified. Propose and justify methods that IND-TECH’s management could use to effectively communicate these issues to its employees.

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**End of Question 3**

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**Section II**

**40 marks**

**Attempt Questions 4–5**

**Allow about 35 minutes for this section**

Answer the questions in the spaces provided.

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**Marks**

**Question 4 (20 marks)**

IND-TECH is to build a deck, attached to the rear of a house in a seaside location. The deck is to measure 2.4 m × 4.8 m and is to be 450 mm above ground level. The deck is to be made from CCA treated pine.

- (a) Identify a suitable alternative timber. Justify your selection.

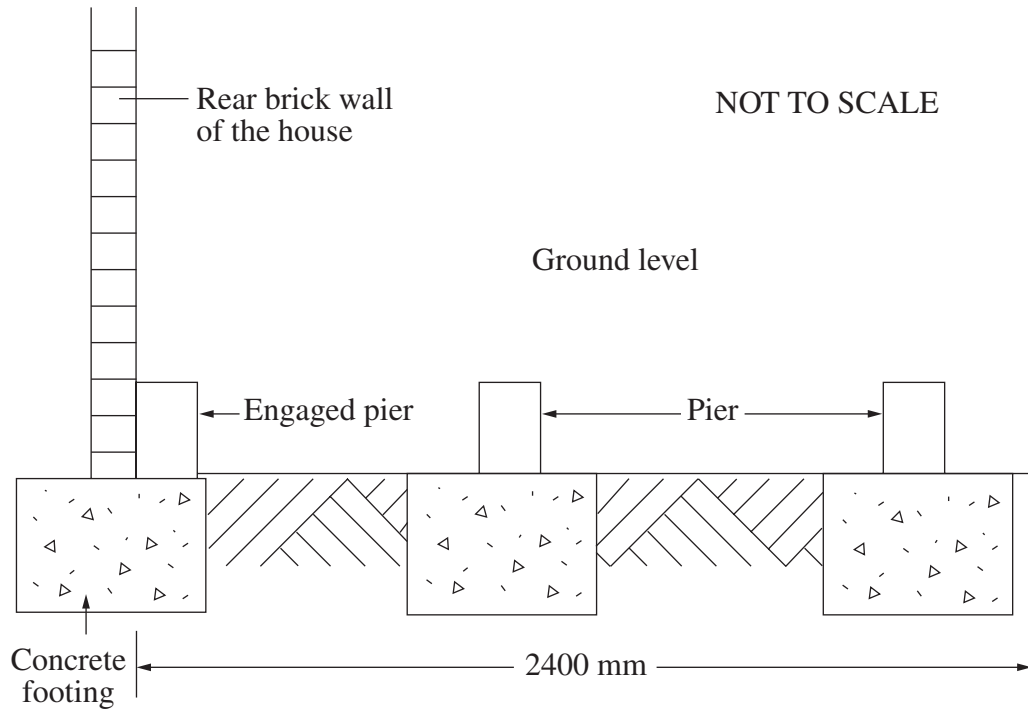
**2**

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**Question 4 continues on page 14**

Question 4 (continued)

- (b) Sketch and label the cross-section of the deck, showing the below-floor timber details and decking. 3



- (c) Referring to the diagram in part (b), complete the cutting list. 3

CUTTING LIST

	<i>Component</i>	<i>Material</i>	<i>Number required</i>	<i>L</i>	<i>W</i>	<i>T</i>
1	Decking	Treated pine			70	19
2		Treated pine				
3		Treated pine				

Question 4 continues on page 15

Question 4 (continued)

- (d) Describe the process of attaching the decking timber. Identify the tools and the hardware to be used, giving reasons for your choice. **4**

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**Question 4 continues on page 16**





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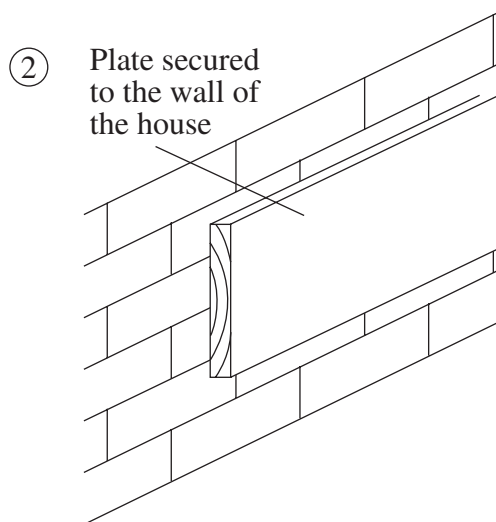
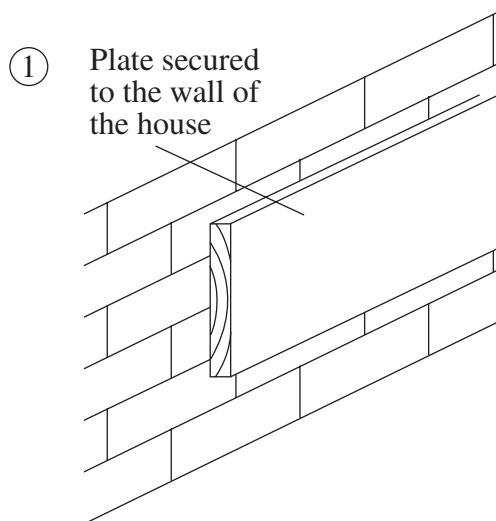
**Section II (continued)**

**Marks**

**Question 5 (20 marks)**

A roof is to be built over the newly-constructed treated-pine deck. Polycarbonate sheeting will be used as the roof covering. The rafters for the roof are to be attached to a plate secured to the wall of the house, and supported by means of a header beam at the front of the deck.

- (a) Sketch TWO methods of attaching the rafters to the wall plate. Label your sketches. **2**

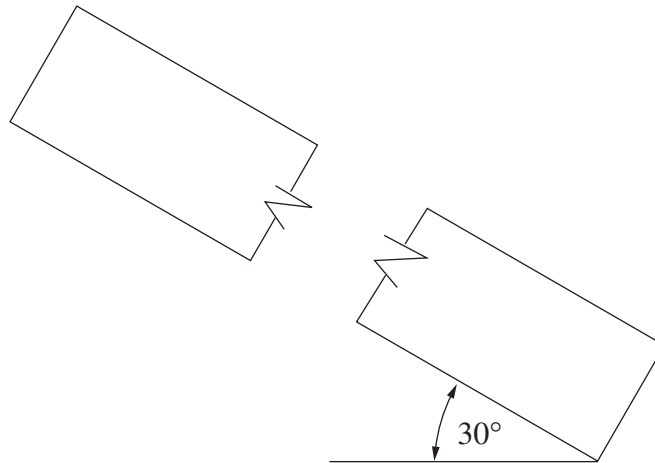


**Question 5 continues on page 18**

Question 5 (continued)

- (b) On the rafter sketched below, show the appropriate saw cuts necessary to prepare the rafters prior to their final placement. Explain why these cuts are required.

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- (c) Name and sketch the hardware item that should be used to attach the polycarbonate sheets to the timber.

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Question 5 continues on page 19

Question 5 (continued)

- (d) Using sketches, show how the polycarbonate sheets should be attached to the rafters. Describe the preparation of the polycarbonate sheets and the processes used. **4**

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**Question 5 continues on page 20**

Question 5 (continued)

- (e) Building project plans need to be submitted to the local council for consideration and approval prior to construction. **8**

Discuss why this is necessary, and how this process impacts on the builder, the client and the local council.

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