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Centre Number

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Student Number

**2001**  
**HIGHER SCHOOL CERTIFICATE**  
**EXAMINATION**

# Industrial Technology

## Electronics Industries

### General Instructions

- Reading time – 5 minutes
- Working time – 1½ 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 page 13

### Total marks – 100

**Section I** Pages 2–10

#### 60 marks

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

**Section II** Pages 13–18

#### 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**

Use this information to answer Questions 1 and 2.

A company from the electronics industries needs to expand its operations extensively because of increased sales, improved marketing and the introduction of new products.

**Question 1** (20 marks)

- (a) Prior to the introduction of new products, the company had limited production capacity. New technologies were examined to overcome this problem.

**8**

Identify and describe a new technology related to this industry. Explain how this technology could improve the production capacity of the company.

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**Question 1 continues on page 3**

Question 1 (continued)

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(b) Outline how the expansion of the company could impact on its organisation and management. **2**

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(c) Describe TWO marketing features that would support the expansion of the company. **2**

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**Question 1 continues on page 4**

Question 1 (continued)

(d) Owing to increased sales, mass production and quality control techniques are investigated to meet the demand for the new products and to improve services to the consumer.

(i) What is mass production? Explain how the introduction of mass production could affect the profitability of the company. **4**

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(ii) Describe how quality control could be used to improve BOTH the products and the services provided to the consumer. **4**

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**End of Question 1**

**Question 2** (20 marks)

The same company needs to improve its efficiency in order to expand.

- (a) List the implications for the company of purchasing new equipment to improve its efficiency. **2**

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- (b) The company has decided to multiskill its workforce.
  - (i) Outline how multiskilling could make this company more efficient. **2**

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- (ii) Describe personnel issues other than multiskilling that would directly influence efficient production. **4**

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**Question 2 continues on page 6**

Question 2 (continued)

- (c) Describe how computer software applications can be used to assist in the effective planning, development and management of production projects. **6**

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- (d) Discuss training methods that the company could use to ensure that staff are competent in their use of its software applications. **6**

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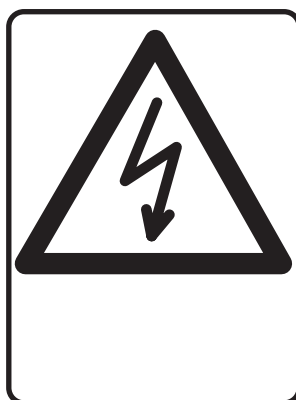
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**End of Question 2**

**Question 3** (20 marks)

- (a) Workplace injuries account for a large amount of lost production time.

In order to address this concern, a company from the electronics industries has decided to display a number of safety signs throughout the workplace. A sample is shown.



- (i) What message does the safety sign convey? **1**

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- (ii) Explain how the features of this sign add to its effectiveness in communicating the intended message. **3**

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**Question 3 continues on page 8**

Question 3 (continued)

- (iii) Why is it important to carefully consider the placement of this safety sign in the workplace? **2**

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- (iv) Name strategies, other than signage, that this company could use to reduce workplace injuries. **2**

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**Question 3 continues on page 9**



Question 3 (continued)

- (b) (i) The company has decided to develop a safety manual containing both text and graphics. Outline the range of information-processing skills required to prepare and present this manual. Make reference to appropriate computer software in your answer.

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**Question 3 continues on page 10**

## Question 3 (continued)

- (ii) The company has decided to produce 80 copies of the new safety manual. Each manual contains 15 pages. 3

Complete the table, indicating the costs of producing these manuals.  
All prices are inclusive of GST.

<i>Item</i>	<i>Unit cost</i>	<i>Total cost</i>
Artwork	\$200.00	\$200.00
Printing	50 cents per page	
Reams of paper	\$6.00 per ream (500 sheets)	
Binding for manual	\$4.00 per manual	

**End of Question 3**

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Student Number

**Section II**

**40 marks**

**Attempt Questions 4–5**

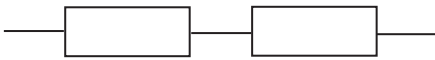
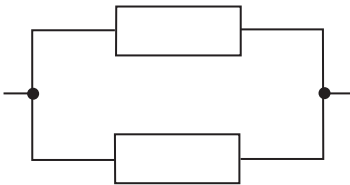
**Allow about 35 minutes for this section**

Answer the questions in the spaces provided.

**Marks**

**Question 4 (20 marks)**

- (a) (i) Complete the table by identifying how the two resistors in each diagram are connected. **2**

- (ii) Name the connection that reduces the total resistance of the combination. **2**  
 Explain why this connection reduces total resistance.

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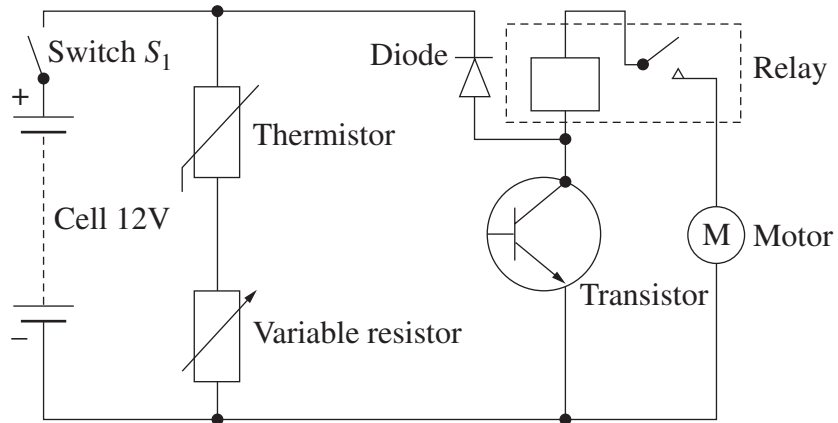
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**Question 4 continues on page 14**

Question 4 (continued)

(b) Use the temperature control circuit diagram to answer parts (i) and (ii).



(i) This circuit diagram contains design faults. Correct the design faults on the diagram so that the circuit would operate properly. 3

(ii) Explain what will happen in the corrected circuit when Switch  $S_1$  is turned on. 4

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Question 4 continues on page 15

Question 4 (continued)

- (c) Finding electronic component failures can be time consuming and costly. **9**  
Outline and justify the use of an appropriate testing strategy, together with the equipment required, that could be used as part of the mass production of quality computer motherboards.

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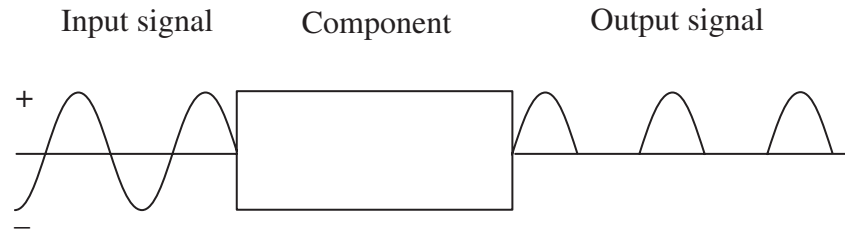
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**End of Question 4**

**Question 5** (20 marks)

- (a) (i) Identify the electronic component that changes the input signal to the output signal as shown. **1**



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- (ii) Describe how the electronic component identified in part (i) operates in order to produce the output signal shown. **2**

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- (b) What is potential difference? Explain why it is required to create an electric current. **4**

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**Question 5 continues on page 17**



Question 5 (continued)

- (c) Name and describe a method for manufacturing printed circuit boards (PCBs). **4**

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**Question 5 continues on page 18**

Question 5 (continued)

- (d) Analyse the advantages and disadvantages of using two different chemicals to produce tracks on a printed circuit board. In your answer, include any occupational health and safety issues related to the use of these chemicals.

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