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Student Number

2006
HIGHER SCHOOL CERTIFICATE
EXAMINATION

Industrial Technology

Electronics 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.

Marks

Use the following information to answer Questions 1 and 2.

IND-TECH is a company in the electronics industry. Competition from cheap imports has led the company to investigate organisational changes to prevent closure. The present workforce is to be retained.

Question 1 (20 marks)

- (a) Identify organisational changes that IND-TECH could make to become more competitive. **2**

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- (b) Outline reasons why IND-TECH would want to keep their present workforce. **3**

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Question 1 continues on page 3

Question 1 (continued)

- (c) Discuss how retraining some of the workforce could help IND-TECH remain competitive. 4

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- (d) Outline possible roles for unions during the organisational change. 4

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Question 1 continues on page 4

Industrial Technology
Electronics Industries

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Student Number

Section I (continued)

Marks

Question 2 (20 marks)

- (a) Identify ways in which IND-TECH's costs could be reduced through recycling. **2**

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- (b) Name an emerging technology, and outline how it could improve IND-TECH's production system. **3**

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Question 2 continues on page 6

Question 2 (continued)

- (c) What is *mass production*? How could mass production help IND-TECH compete with cheap imports? **4**

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- (d) Describe safe material handling practices and how these practices could improve efficiency and reduce costs for IND-TECH. **4**

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Question 2 continues on page 7

BLANK PAGE

**Industrial Technology
Electronics Industries**

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Student Number

Section I (continued)

Marks

Question 3 (20 marks)

- (a) List TWO characteristics of Occupational Health and Safety (OHS) signage that would help employees to understand safe working procedures. **2**

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- (b) Outline the advantages of using computer software graphics to create company documentation. **3**

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Question 3 continues on page 10

Question 3 (continued)

(c) An extract from a catalogue is shown.

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Discuss the advantages of displaying graphics AND text in this catalogue extract.

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Question 3 continues on page 11

Question 3 (continued)

(d) An extract from a Material Safety Data Sheet (MSDS) for toner is shown.

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| <p>Section VI – Health Hazard Data</p> <hr/> <p><i>Health Hazards (Acute and Chronic):</i> This material when used as intended, does not represent a health or safety hazard.</p> <hr/> <p><i>Signs and Symptoms of Exposure:</i> Nil</p> <hr/> <p><i>Medical Conditions:</i> None when used as described by product literature.</p> |
| <p>Section VII – Precautions for Safe Handling and Use</p> <hr/> <p><i>Steps to be Taken in Case Material is Released or Spilled:</i> Loose toner can be removed using a vacuum cleaner. Residue can be removed with soap and cold water. After removal of loose toner, garments may be washed or dry-cleaned.</p> <hr/> <p><i>Waste Disposal Method:</i> Do not incinerate. No special techniques beyond normal practice. Ensure conformity with federal, state or local regulations.</p> <hr/> <p><i>Precautions to be taken in Handling and Storing:</i> Avoid inhalation of excessive dust. Store below 30°C.</p> |

Outline reasons why these sheets are produced, and their relevance for IND-TECH.

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Question 3 continues on page 12

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Student Number

Section II

40 marks

Attempt Questions 4–5

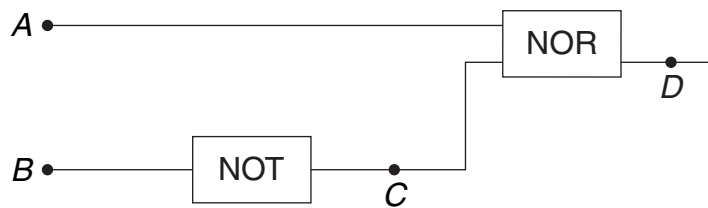
Allow about 35 minutes for this section

Answer the questions in the spaces provided.

Marks

Question 4 (20 marks)

- (a) A block diagram of a simple logic circuit is shown. If the input at *A* = logic 1, and the input at *B* = logic 1, identify the logic values at *C* and *D*. 2



C = Logic

D = Logic

- (b) Explain how Light Dependent Resistors (LDRs) operate. 3

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Question 4 continues on page 14

Question 4 (continued)

- (c) Identify the properties of semiconductor materials that make them conductors or insulators.

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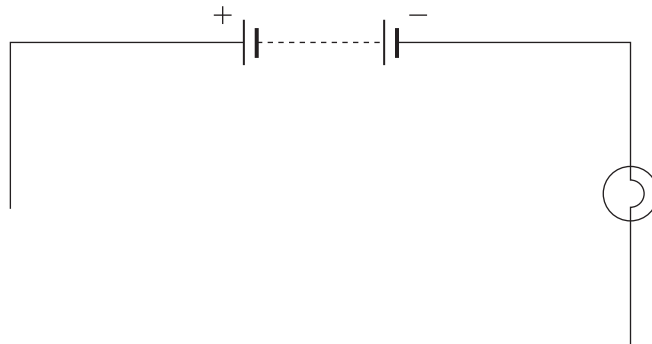
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- (d) Complete the sketch of the circuit below to show a power diode connected in forward bias. Explain what happens to the current flow in the circuit if the diode is reversed.

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Question 4 continues on page 15

Question 4 (continued)

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End of Question 4

Industrial Technology
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Student Number

Section II (continued)

Marks

Question 5 (20 marks)

- (a) Identify ways of minimising the risk of receiving an electric shock when working with electronic circuits. **2**

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- (b) What is *electrical power*? What does the power rating of electrical equipment indicate? **3**

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Question 5 continues on page 18

Question 5 (continued)

(e) A light-operated alarm circuit is shown below.

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Propose and explain a fault-finding sequence for testing this circuit if the speaker does not produce an output.

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Question 5 continues on page 20

