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Centre Number

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Student Number

2005
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 13–19

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

IND-TECH is a company in the electronics industry. The introduction of improved marketing strategies has increased demand for IND-TECH's products. Management is aware that a planned restructure and expansion program will impact on IND-TECH's production.

Question 1 (20 marks)

- (a) Greater demand for IND-TECH's products can be met through increased production. **2**

Identify TWO ways in which increased production can be achieved.

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- (b) Identify a marketing strategy, and outline how this strategy could increase the demand for a product. **3**

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Question 1 continues on page 3

Question 1 (continued)

- (c) Define the term *quality control*. Explain how quality control can be used to improve IND-TECH's products. **4**

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- (d) IND-TECH's management is planning to restructure its workforce. **4**

Discuss how management will ensure stable industrial relations during this operation.

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Question 1 continues on page 4

- 7

[illegible]

- 4 -

Industrial Technology
Electronics Industries

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Centre Number

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Section I (continued)

Student Number

Marks

Question 2 (20 marks)

- (a) List TWO advantages of *multiskilling* in industry. **2**

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- (b) Explain an effect that specialisation could have on production and on the workforce. **3**

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Question 2 continues on page 6

Question 2 (continued)

- (c) Explain the term *sustainable development*, and recommend ways in which IND-TECH might make its operation more sustainable. **4**

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- (d) Discuss the influence of occupational health and safety (OHS) legislation on production. **4**

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Question 2 continues on page 7

- Identify and discuss issues that could be covered in this statement.

[illegible]

- 7 -

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Student Number

Section I (continued)

Marks

Question 3 (20 marks)

- (a) Outline the purpose of a materials list in the planning or the production process. **2**

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- (b) Explain why shapes and colours are used in safety symbols. Use an example to support your answer. **3**

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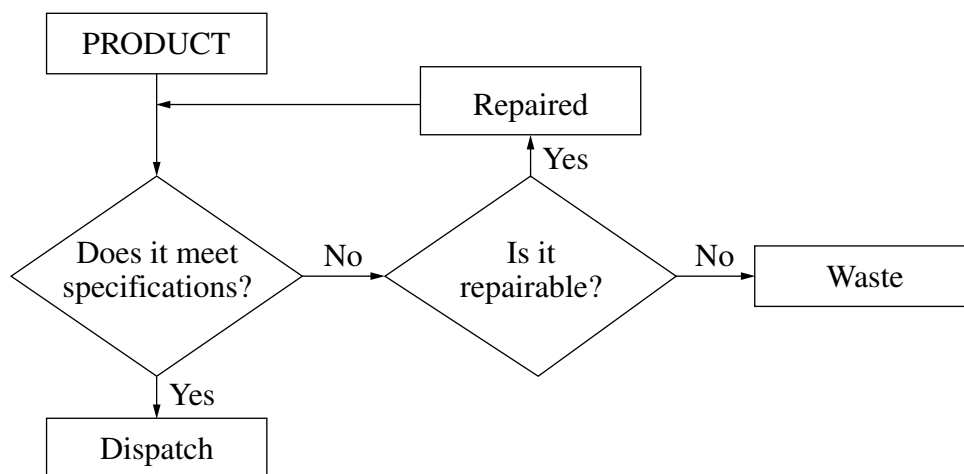
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Question 3 continues on page 10

Question 3 (continued)

(c) The diagram shows a process within a production system.

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Identify the type of diagram used. Explain why this type of diagram is suitable for representing the steps outlined in this production system.

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Question 3 continues on page 11

Question 3 (continued)

- (d) Outline the importance of function and aesthetics in the design of a product. **4**

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Question 3 continues on page 12

- Outline the processes the consultant would follow when:

- collecting and analysing information
- identifying the problems
- recommending possible outcomes
- preparing a draft report, and
- presenting the findings.

[illegible]

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**Industrial Technology
Electronics Industries**

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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)

Use the circuit shown to answer Question 4.



- (a) Outline the function of the light dependent resistor (LDR).

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Question 4 continues on page 15

Question 4 (continued)

- (b) Outline the general characteristics of speakers that would need to be considered before selecting a suitable output device for this circuit. **3**

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- (c) Identify and outline the function of each type of capacitor used in the circuit. **4**

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- (d) Identify the type of transistor used in the circuit, and describe how this type of transistor operates. **4**

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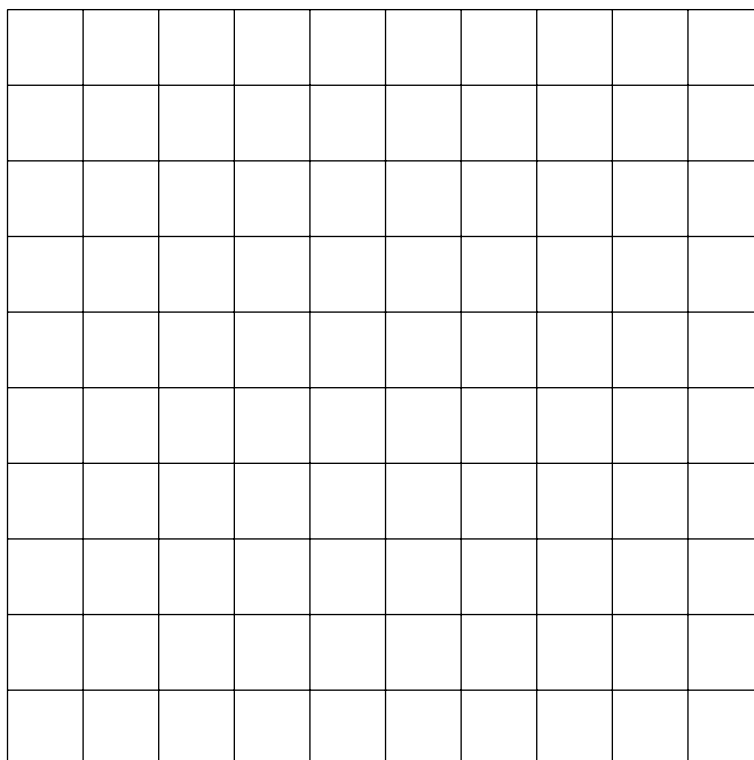
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Question 4 continues on page 16

Question 4 (continued)

- (e) Using the grid provided, design a copper-side track layout of a printed circuit board (PCB) for the sound effects simulator. Explain the relationship between the track layout and the component layout.

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End of Question 4

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Student Number

Section II (continued)

Marks

Question 5 (20 marks)

- (a) Describe the term VLSI in relation to integrated circuits (ICs). **2**

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- (b) An integrated circuit chip is shown. **3**



Identify the essential features of the integrated circuit shown.

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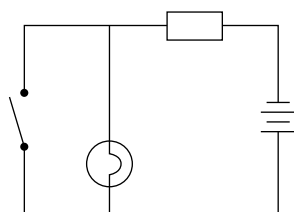
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Question 5 continues on page 18

Question 5 (continued)

- (c) The circuit shown represents a logic gate.

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Identify the logic gate, and explain how the circuit operates.

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- (d) Compare the properties of free-running electric motors and stepped electric motors.

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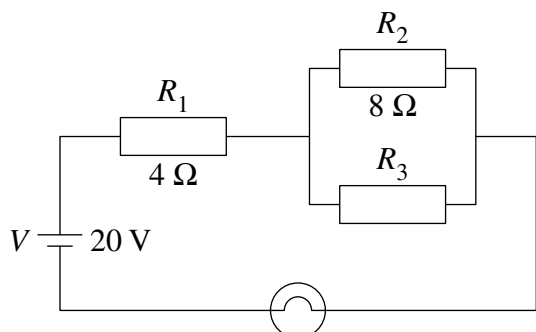
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Question 5 continues on page 19

Question 5 (continued)

- (e) Calculate the resistance value R_3 , required to enable the 40 W globe to operate at its normal power rating.

7



Formulae

$$V = IR$$

$$P = VI$$

$$R_T = R_1 + R_2 + R_3 + \dots$$

$$1/R_T = 1/R_1 + 1/R_2 + 1/R_3 + \dots$$

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