



--	--	--	--	--

Centre Number

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

Student Number

2009
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, 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 11–18

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.

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
Electronics 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
Electronics 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**

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

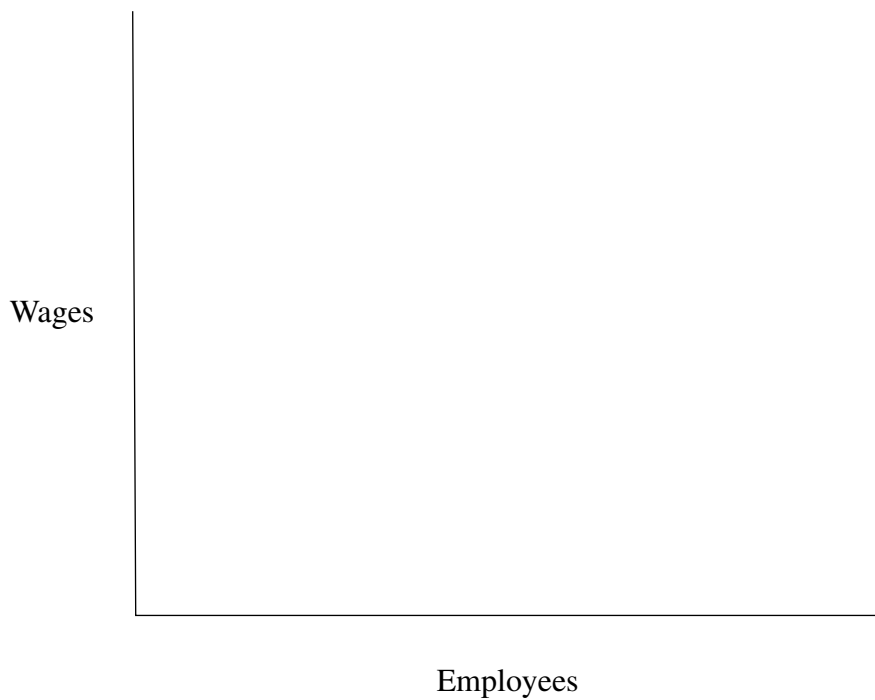
Question 3 continues on page 8

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 Electronics 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.

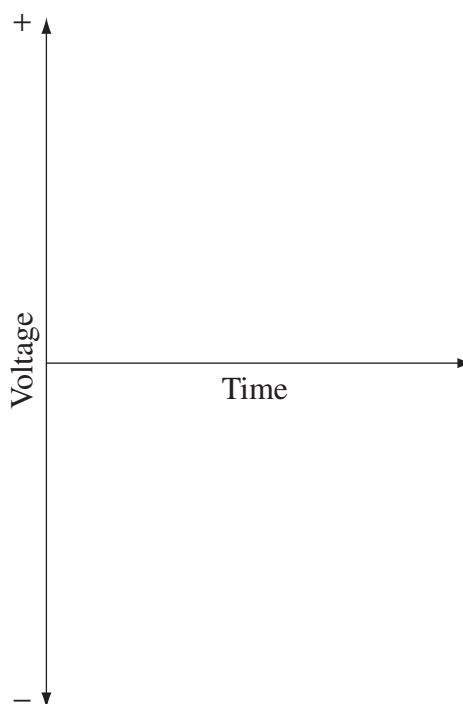
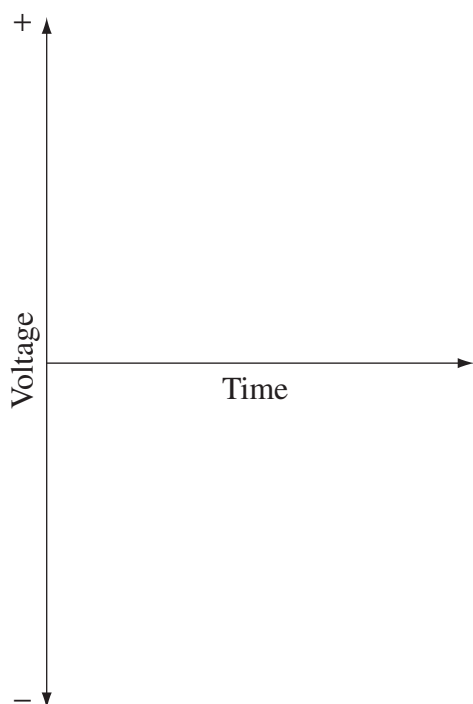
Question 4 (20 marks)

- (a) What units are used to measure electrical potential and electron flow? 2

Electrical potential:

Electron flow:

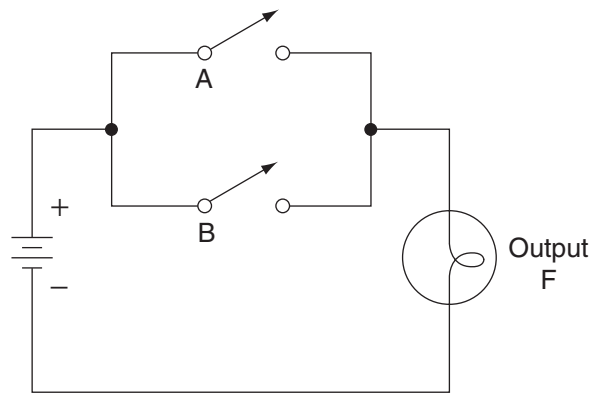
- (b) Sketch and label the characteristic shape of BOTH a digital signal and an analogue signal on the axes below. 3



Question 4 continues on page 12

Question 4 (continued)

- (c) The circuit shown is controlled by two input switches A and B. The output of the circuit is a small globe labelled F. The circuit is powered by a battery.



- (i) Complete the truth table shown.

3

A	B	F
0	0	0
0	1	
1	0	
1	1	

- (ii) What is the name for a logic gate with this truth table?

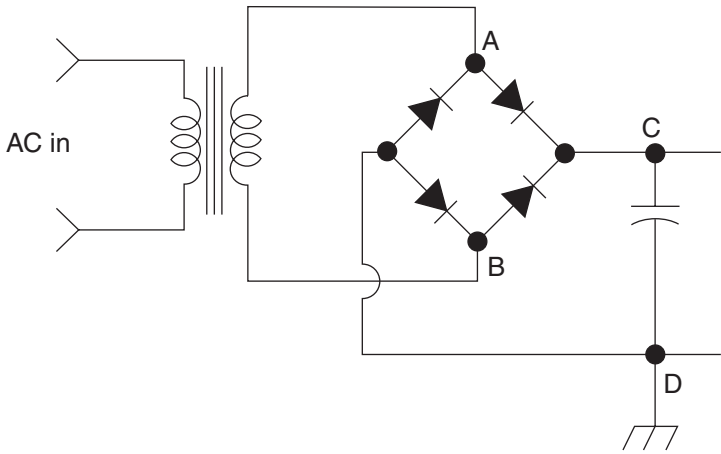
1

.....

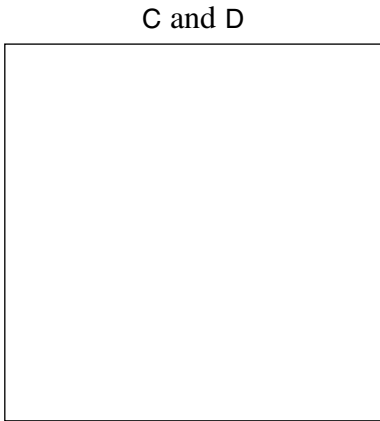
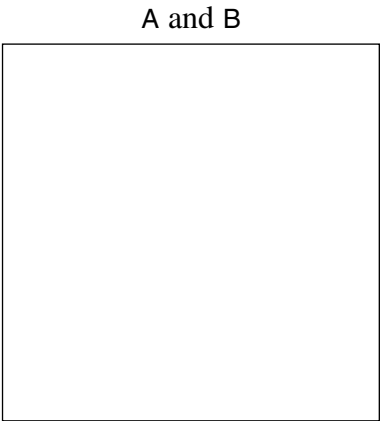
Question 4 continues on page 13

Question 4 (continued)

(d) The circuit shown is for a power supply.



(i) Sketch the output waveform seen on a cathode ray oscilloscope screen when the probes are connected across the points specified. 2



(ii) What are the functions of the capacitor and the bridge diodes in the circuit? 2

Capacitor:

Bridge diodes:

Question 4 continues on page 14

Question 4 (continued)

- (e) High intensity light emitting diodes (LEDs) are now being used in many low voltage lighting applications. 7

Evaluate LED technology in terms of power requirements, light output and cost. Use examples to illustrate your answer.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

End of Question 4

Industrial Technology
Electronics Industries

--	--	--	--	--

Centre Number

Section II (continued)

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

Student Number

Question 5 (20 marks)

- (a) Name TWO different types of variable resistors. **2**

.....
.....

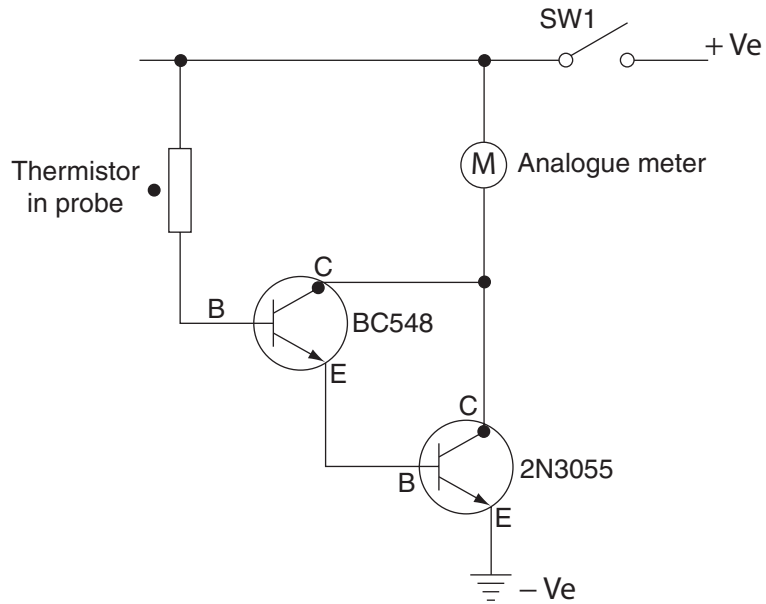
- (b) How does the operation of a stepped (stepper) motor differ from that of an ordinary free running (direct current) motor? **3**

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

Question 5 continues on page 16

Question 5 (continued)

- (c) The circuit shown is for a portable temperature gauge, using a thermistor in a plastic probe attached to an analogue meter.



- (i) Outline the function of the thermistor in this circuit. 2

.....

.....

.....

.....

- (ii) What is the relationship between the operation of the general purpose transistor and that of the power transistor? 2

.....

.....

.....

.....

Question 5 continues on page 17

Question 5 (continued)

(d) Compare the operation of a solenoid and a relay as electrical switching devices. **4**

.....

.....

.....

.....

.....

.....

.....

.....

.....

Question 5 continues on page 18

Question 5 (continued)

- (e) Evaluate technologies that are used to generate and store electrical energy in remote locations where mains power is not available. Use examples to illustrate your answer.

7

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

End of paper