BOARD OF STUDIES
NEW SOUTH WALES

2012

HIGHER SCHOOL CERTIFICATE EXAMINATION

Industrial Technology
Electronics Technologies

General Instructions

- Reading time – 5 minutes
- Working time – $1\frac{1}{2}$ hours
- Write using black or blue pen
  Black pen is preferred
- Draw diagrams using pencil
- Board-approved calculators may be used
- Write your Centre Number and Student Number at the top of page 5

Total marks – 40

Section I Pages 2–4

10 marks

- Attempt Questions 1–10
- Allow about 20 minutes for this section

Section II Pages 5–7

15 marks

- Attempt Questions 11–15
- Allow about 35 minutes for this section

Section III Page 9

15 marks

- Attempt Question 16
- Allow about 35 minutes for this section

Section I

10 marks
Attempt Questions 1–10
Allow about 20 minutes for this section

Use the multiple-choice answer sheet for Questions 1–10.

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1 What is the name of the tool shown?

(A) IC insertion tool

(B) Liquid flux injector

(C) Pin punch

(D) Solder sucker

2 Which of the following uses a momentary switch?

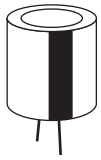
(A) Car horn

(B) Room light switch

(C) Switch on a kettle

(D) Kitchen exhaust fan

3 What does the black stripe on a capacitor indicate?



(A) Size

(B) Value

(C) Polarity

(D) Non-variability

4 Which of the following is a binary number?

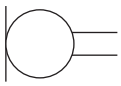
(A) 0123

(B) 1010

(C) 1212

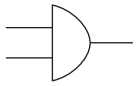
(D) 2222

5 Which of the following is the electronic symbol for a microphone?

(A) 

(B) 

(C) 

(D) 

6 Which of the following equations describes Ohm's Law?

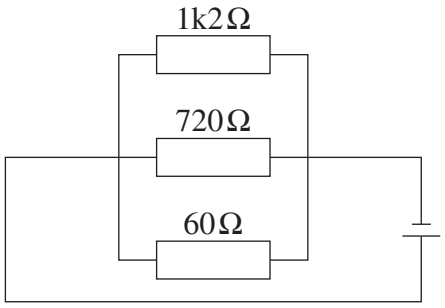
(A) $E = \frac{CV^2}{2}$

(B) $I = \frac{V}{R}$

(C) $\frac{1}{C_T} = \frac{1}{C_1} + \frac{1}{C_2} + \frac{1}{C_3}$

(D) $R_T = R_1 + R_2 + R_3$

7 What is the total resistance of the circuit shown?



(A) 6 Ω

(B) 53 Ω

(C) 930 Ω

(D) 2080 Ω

8 What is a characteristic of a zener diode?

(A) It only allows current to flow in the absence of light.

(B) It emits light only after the required voltage is met.

(C) It will never allow current to flow in the reverse direction.

(D) It will allow current to flow in the reverse direction under certain conditions.

9 A circuit requires 27 mm of solder to manufacture it.

What is the maximum number of circuits that can be soldered from a 20 m roll of solder?

(A) 270

(B) 540

(C) 740

(D) 1280

10 A track design for a circuit is to be etched from blank circuit board. The full size of a blank circuit board is 1 m × 1 m. Each circuit requires 50 mm × 75 mm of board.

What is the maximum number of circuits that can be made from one blank circuit board?

(A) 125

(B) 150

(C) 260

(D) 666

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Section II

15 marks
Attempt Questions 11–15
Allow about 35 minutes for this section

Answer the questions in the spaces provided. These spaces provide guidance for the expected length of response.

Question 11 (2 marks)

How can computers be used in PCB design? **2**

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Question 12 (3 marks)

Draw a circuit diagram of a torch, using electronic component symbols. **3**

Question 13 (3 marks)

Describe the operation of a movement switch. In your response, include an example. **3**

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Question 14 (3 marks)

How can an oscilloscope be used for testing electronic circuits? **3**

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Question 15 (4 marks)

What are the benefits of using computer software to simulate electronic circuits? **4**

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Industrial Technology
Electronics Technologies

Section III

15 marks
Attempt Question 16
Allow about 35 minutes for this section

Answer the question in a writing booklet. Extra writing booklets are available.

Question 16 (15 marks)

A company is considering expanding its operations to take advantage of new and emerging web-based technologies.

(a) Describe a range of web-based technologies the company could use to market and sell its goods and/or services. **5**

(b) Describe the possible impact on both the work practices and the organisation of the company if web-based technologies were implemented. **10**

End of paper

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