

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 5–8

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.

1 Which units are used to measure potential difference?

- (A) Amps
- (B) Farads
- (C) Ohms
- (D) Volts


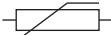


2 What is the main advantage of a stepped motor?

- (A) It operates at high speed.
- (B) Cost of production is low.
- (C) Fewer brushes are required.
- (D) It allows accurate incremental movements.

3 How does a Zener diode differ from a semiconductor diode?

- (A) It regulates voltage.
- (B) It passes current in both directions.
- (C) It passes current in one direction only.
- (D) It increases the voltage possible in the circuit.

4 Which of the following symbols represents a thyristor?

- (A) 
- (B) 
- (C) 
- (D) 

- 5 A truth table is shown.

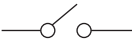
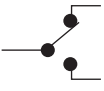
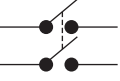
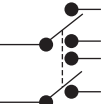
A	B	AB
0	0	1
0	1	1
1	0	1
1	1	0

Which type of logic gate is represented?

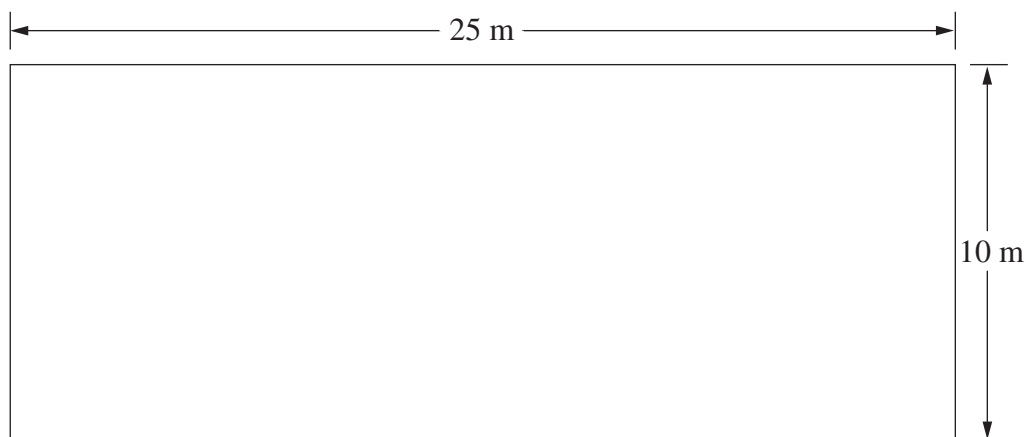
- (A) OR
 (B) AND
 (C) NOR
 (D) NAND
- 6 Which of the following formulae would be used to calculate capacitance in a parallel circuit?

- (A) $C_t = C_1 + C_2 + \dots$
 (B) $\frac{1}{C_s} = \frac{1}{C_1} + \frac{1}{C_2} + \dots$
 (C) $C_t = C_1 \times C_2 \times \dots$
 (D) $C = \frac{Q}{V}$

- 7 Which of the following symbols represents a DPST switch?

- (A) 
- (B) 
- (C) 
- (D) 

- 8 The dimensions of an electronics workshop are shown. 15 m^2 of its floor area is dedicated to storage.



- What percentage of the total floor area is dedicated to storage?
- (A) 6%
(B) 12%
(C) 60%
(D) 67%
- 9 Which of the following statements is correct for the operation of transformers?
- (A) A steady DC voltage can be stepped up or down.
(B) The primary coil is coupled to the secondary coil by a magnetic field.
(C) There are fewer secondary coils than primary coils when stepping up.
(D) The primary and secondary coils must touch to allow voltage generation.
- 10 A large electronics company pays for its workers' professional association fees. The fee is \$457 for a full-time technician and \$250 for a part-time technician. An apprentice fee is 48% of a part-time technician's fee.

How much does it cost the company if there are 137 full-time technicians, 22 part-time technicians and 27 apprentices?

- (A) \$65 849
(B) \$68 109
(C) \$71 349
(D) \$74 589

Industrial Technology

Electronics Technologies

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Centre Number

Section II

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Student Number

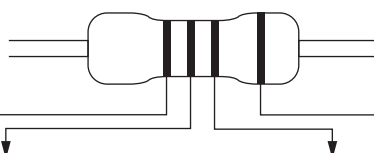
15 marks

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 (1 mark)



Colour	1st Band	2nd Band	3rd Band	Decimal Multiplier		Tolerance	
Black	0	0	0	1	1	±	1%
Brown	1	1	1	10	10	±	2%
Red	2	2	2	100	100		
Orange	3	3	3	1K	1000		
Yellow	4	4	4	10K	10000		
Green	5	5	5	100K	100000		
Blue	6	6	6	1M	1000000		
Violet	7	7	7	10M	10000000		
Grey	8	8	8		100000000		
White	9	9	9		1000000000	±	5%
Gold					0.1	±	10%
Silver					0.01	±	20%
None							

What is the value of a 4 band resistor which has red, red, red and silver bands?

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Question 12 (3 marks)

Outline a method used to manufacture a PCB.

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Question 13 (3 marks)

Explain how relays operate.

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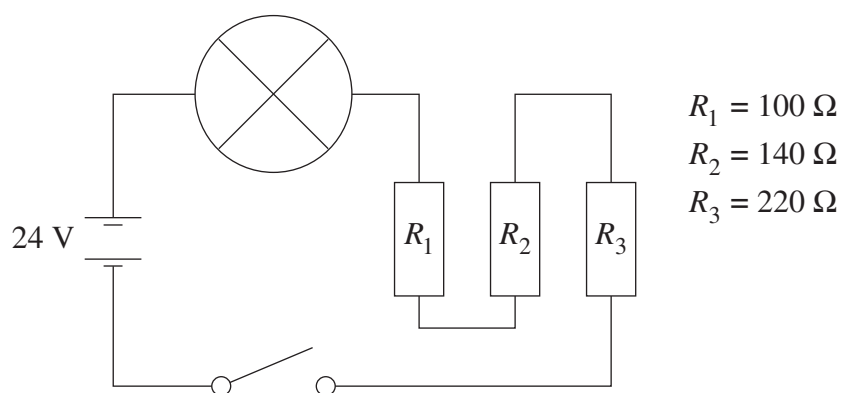
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Question 14 (3 marks)

Calculate the voltage at each resistor R_1 , R_2 and R_3 for the circuit shown when the switch is closed. Show all working.

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Question 15 (5 marks)

Describe the advantages of using integrated circuits in the design and development of electronic devices.

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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) Describe the impact of government legislation on work practices. **6**
- (b) Evaluate the effect of new and emerging technologies on work practices in industry. **9**

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