

# Licensed Electrician's Theory (LET) Assessment Sample Paper Marking Guide 2024

## AS/NZS 3000 Wiring Rules

### Question 1

75mm (2 marks)

Clause 4.4.2.2 (b) (2 marks)

### Question 2

No (2 marks)

Clause 5.4.5 Exceptions 1 (2 marks)

### Question 3

Persons or livestock (2 marks)

Clause 2.7.3 (c) (2 marks)

### Question 4

No, lifts shall be supplied by a dedicated circuit (2 marks)

Clause 4.20.2 (2 marks) Correct for non-Safety Services only.

## AS/NZS 3012 Construction and Demolition Sites

### Question 5

A qualified person (2 marks)

Clause 3.3.1 (2 marks)

### Question 6

Electrical regulators (2 marks)

Clause 3.9 (2 marks)

## Electrical Safety (General) Regulations 2019

### Question 7

A written report of the incident (2 marks)

Regulation 401(3) (2 marks)

## Electrical Shock Survival

### Question 8

Check safety to yourself and others (Check for danger) (2 marks)

30 compressions and 2 breaths (2 marks)

## Cable Selection

### Question 9

Part (i)

Table 3(4) Item 4 (1 Mark - item number is optional do not deduct marks)

Table 14 Col 25 (2 Marks)

Table 26(2) Col 3 Derating for Touching 2 circuits = 0.9 (1 Mark)

Table 28(2) Col 3 Derating for Depth 1m = 0.96 (1 Mark)

2 cables in parallel  $260 / 2 = 130A$  per cable

$35\text{mm}^2 = 130A$

$130 \times 0.9 \times 0.96 = 112.32A$

$50\text{mm}^2 = 155A$

$155 \times 0.9 \times 0.96 = 133.92$

Answer  $50\text{mm}^2$

Part (ii)

Table 28(2) Col 3 Derating for Depth 0.6m = 0.99

$155 \times 0.9 \times 0.99 = 138.11A$

Answer =  $50\text{mm}^2$  (1 Mark for all)

(Deduct 1 Mark for no or incorrect units)

## DC Circuits

### Question 10

$I_c = 200\text{mA}$  or  $0.2A$  (2 marks)

$R_b = 60\Omega$  (2 marks)

$V_T = 100V$  (2 marks)

Deduct 1 mark for no or incorrect units.

## Maximum Demand

### Question 11

Table C2 Column 2 (1 mark)

- 1 - 5kW Electric roller door
- 1 - 12A reverse cycle air conditioner
- 56 - 15W LED lighting points
- 1 - 5.8kW cooking appliance
- 26 - 10A double socket outlets

#### Domestic Residence.

Table C2 Column 2

Equipment	Load Group	Calculation	Maximum Demand
1 – 5kW Electric roller door	(d)	Full connected load 21.74A $5000/230 = 21.74A$	21.74A (1 mark)
1 - 12A reverse cycle air conditioner	(c)(i)	50% connected load $12A \times 50\% = 6A$	6A (1 mark)
56 - 15W LED lighting points	A	75% connected load $56 \times 15 = 840W$ $840/230 = 3.65A$ $3.65 \times 75\% = 2.74A$	2.74A (1 mark)
1 - 5.8kW cooking appliance	(c)(i)	Full connected load $5800/230 = 25.22A$	25.22A (2 mark)
26 - 10A double socket outlets 52 Points total	(b)(ii)	$1000W + (100 \times 51) = 6100$ $6100/230 = 26.52A$	26.52A (1 mark)
<b>Total Maximum Demand</b>			82.22A (1 mark)

Deduct 1 mark for no or incorrect units on total, deduct 1 mark for no or incorrect load groups.

## Voltage Drop

### Question 12

#### Consumer's Mains

Table 40 Column 6 (1 mark)

Vc 1.54 (1 mark)

Vd =  $30 \times 80 \times 1.54/1000$

Vd 3.7V (1 mark)

#### Sub-mains

Table 40 Column 6 (1 mark)

Vc 1.12 (1 mark)

$$V_d = 25 \times 40 \times 1.12/1000$$

V<sub>d</sub> 1.12V (1 mark)

### Final Sub-circuit

Table 40 Column 4 (1 mark)

V<sub>c</sub> 14.9 (1 mark)

$$V_d = 18 \times 26 \times 14.9/1000$$

V<sub>d</sub> 6.97V (1 mark)

Total Voltage Drop = 3.7 + 1.12 + 6.97 = 11.79 V (1 mark)

Deduct 1 mark for no or incorrect units on total. Deduct 1 mark for no or incorrect table number/s.

## Overload and Short Circuit Calculations

### Question 13

Overcurrent divided by MCB current rating = 2 (1 mark)

Minimum Time = Accept 26 - 28 seconds (1 mark)

Maximum Time = Accept 114 - 117 seconds (1 mark)

Deduct 1 mark for no or incorrect time unit.

### Question 14

#### Transformer impedance

230/18000 (2 marks)

0.01278Ω (1 mark) Answer must be to **5 decimal places**.

#### Main switchboard prospective fault

230/ (0.01278 +0.0084) (2 marks)

10,859A (1 mark)

#### Distribution board prospective fault

230/ (0.01278 +0.0084+ 0.0038) (2 marks)

9,207A (1 mark)

Deduct 1 mark for no or incorrect units in final answer.

## Residual Current Devices

### Question 15

16A

## Motor and Starters

### Question 16

B (2 marks)

## AS/NZS 4836:2023

### Question 17

Through an RCD or an isolating transformer (2 marks)

Clause number: 8.3.2 (2 marks)

## Installation Defects - Non Domestic

### Question 18

2 marks for correct defect, 1 mark for the correct clause.

Only some of the defects have been listed below, there are more than 10 defects in the diagram. All correct defects and clauses will be awarded marks.

Only accept the first 5 defects a candidate has listed.

1. Consumer's mains not installed in a manner that can maintain supply if exposed to fire - 7.2.2.1
2. No short circuit protection has been provided at the origin of the consumer's mains - 2.5.1.2 (b)
3. Main Earthing conductor is not provided with insulation - 5.3.2.4
4. The telecommunications earthing conductor is undersized, - 5.6.2.7 (iv)
5. Overcurrent protective device is not rated to carry 125% of the full load current of the fire pump - 7.2.5.6.2 (b) (i)
6. Distribution isolator not marked 'ON' or 'OFF' 2.3.2.2.1 (c )
7. The cable to the distribution board is undersized - 3.4.1
8. Main switch distribution board not labelled 'Main Switch' - 2.3.3.5(a)
9. Main switch fire pump not labelled 'IN THE EVENT OF FIRE DO NOT SWITCH OFF' - 7.2.4.4(b)
10. Strip earth electrode not at minimum horizontal length - 5.3.6.3(i)