# Licensed Electrician's Theory (LET) Licence Assessment
Sample Paper One Marking guide (2021)

## AS/NZS 3000 Wiring Rules

### Q.1

Adjacent to but not on the water heater (2 marks)

Clause 4.8.2.3 (b) (2 marks)

### Q.2

Normal operating conditions (2 marks)

Clause 1.7.1 (a) (2 marks)

### Q.3

(i) obstructs the natural water drain paths: or

(ii) Installing the enclosure within the valley or tray of the roofing material using supports that prevent the obstruction or water or accumulation of debris (2 marks) (either answer is acceptable)

Clause 3.10.3.1 (ii) or 3.10.3.1 (i) is acceptable. (2 marks)

### Q.4

2.5 meters (2 marks)

Clause 6.6.3.4.2 (b) (2 marks)

## AS/NZS 3012 Construction & Demolition Sites.

### Q.5

40lx (2 marks)

Clause 2.7.1 (2 marks)

### Q.6

A switch operating in all live (active and neutral) conductors (2 marks)

Clause 2.4.7 (c) (2 marks)

## Electrical Safety (General) Regulations 2019

### Q.7

The Apprentice Supervision Requirements (2 marks)

Clause 507 (1) (2 marks)

# Electrical Shock Survival

## Q.8

Place the casualty on his back (2 marks)
Tilt the head back and listen for breathing (2 marks)

# Cable Selection

## Q.9

Table 3(3) Item 4 (1 mark)

Table 14 Col 23 (2 marks, one for table and one for column)

Derating factor Table 25(2) 0.88 (1 mark)

Derating factor Table 28(1) 0.99 (1 mark)

Part (i) Answer: 16mm$^2$ (2 marks)

Part (ii) Derating factor Table 25(2) 0.78

Answer: 25mm$^2$ (1 mark)

(Deduct 1 mark for no or incorrect units on final answers. Only deduct one mark regardless of number of missing units)

# DC Circuits

## Q.10

I = 3A (2 marks)
VT = 180V (2 marks)
PT = 900W (2 marks)
(Deduct 1 Mark for no or incorrect units)

# Maximum Demand

## Q.11

Table C1 Column 2 (1 mark)

**Domestic Residence.**

| Equipment | Load Group | Calculation | Maximum Demand |
|---|---|---|---|
| **10A Double socket outlets**<br>**10A Single socket outlets**<br>**34 Points total** | B(i) | 10A for 1-20 points and 5A for each additional 20 points = 15A | 15A (1 mark) |
| **16 A electric vehicle charger** | J(iv) | Full Connected Load 16A | 16A (1 mark) |
| **5 kw storage water heater** | F | Full Connected Load<br>5000/230=21.74A | 21.74A (1 mark) |
| **Lights**<br>**36 Points Total** | A(i) | 3A for 1-20 points and 2A for each additional 20 points = 5A | 5A (1 mark) |
| **3.3kW oven** | C | 50% connected load<br>3300/230= 14.35 x 0.5= 7.17A | 7.17A (2 marks) |
| | | Total Maximum Demand | 64.91A (1 mark) |

(Deduct 1 Mark for no or incorrect units on total, deduct 1 mark for no or incorrect load groups)

# Voltage Drop

## Q.12

**Consumer Mains**

Table 41 Column 6 (1 mark)

Vc 0.84 (1 mark)

Vd 2.14V (1 mark)

**Sub-mains**

Table 41 Column 6 (1 mark)

Vc 1.12 (1 mark)

Vd 2.5V (1 mark)

**Final Sub-circuit**

Table 42 Column 4 (1 mark)

Vc 6.18 (1 mark)

Vd 4.97V (1 mark)

Total Voltage Drop= 2.14+2.5+4.97=9.61V (1 mark)
(Deduct 1 Mark for no or incorrect units on total. Deduct 1 mark for no or incorrect table number/s)

# Overload & Short Circuit Calculations

## Q.13

Overcurrent divided by MCB current rating = 4 (1 mark)
Minimum Time = Accept 2-3 seconds (1 mark)
Maximum Time = Accept 6-8 seconds (1 mark)

(Deduct 1 mark for no or incorrect time unit)

## Q.14

**Transformer impedance**

230/15,560 (2 marks)

0.01478Ω (1 mark) Answer must be to 5 decimal places.

**Main switchboard prospective fault**

230/ (0.01478 +0.0052) (2 marks)

11,511A (1 mark) (also accept 11,512A)

**Distribution board prospective fault**

230/ (0.01478 +0.0052+ 0.028) (2 marks)

4794A (1 mark)

(Deduct 1 Mark for no or incorrect units in final answer)

# Residual Current Devices

## Q.15

35A (1 Mark)

AS/NZS 3000 Clause 2.6.2.1 (a) (2 marks)

# Motor and Starters

## Q.16

D (2 Marks)

# AS/NZS 4836:2011

## Q.17

The general mass of earth at the work site (2 marks)
Clause number: 3.2.6 (2 marks)

# Installation Defects- Non Domestic

## Q.18

(2 marks for correct defect one mark for the correct clause)
(Only accept the first 5 defects candidate has listed)

1. Main Switch not labelled ON/OFF for the fire pump 2.3.2.2.1 (c)
2. Fire pump protection device under rated 7.2.5.6.2 (b) (i)
3. Main Earth cable under sized for the installation 5.3.3.2
4. Consumers' mains are not installed in a manner to maintain supply when exposed to fire 7.2.2.1
5. The cable to the distribution board is undersized – 3.4.1
6. The main neutral connection at the neutral bar is not labelled – 2.10.5.4
7. 'Main switch fire pump' label not in uppercase 7.2.4.4(a)
8. Strip earth electrode not at minimum depth 5.3.6.3
9. No verification records on or at the main switchboard 8.4
10. No MEN installed 5.3.5.1
11. Stripped electrode under sized 5.3.6.2 Table 5.2