Licensed Electrician's Assessment (LEA)

Licensed Electrician's Theory Assessment
Sample Paper 1 Marking Guide (2020)

AS/NZS 3000 Wiring Rules

Question 1

A modification to part(s) of an electrical installation. (2 Marks)

Clause 1.4.8 (2 Marks)

Question 2

Manufactured from materials resistant to such substances. (2 Marks)

Clause 3.3.2.5 (2 Marks)

Question 3

An isolating switch (lockable) in accordance with Clause 2.3.2.2, installed adjacent to but not on the unit, which isolates all parts of the system, including ancillary equipment, such as head units, from the same location. (2 Marks)

Clause 4.19 (2 Marks)

Question 4

The insulation on a conductor shall not be removed any further than is necessary to make the connection. (2 Marks)

Clause 3.7.2.2 (2 Marks)

AS/NZS 3012 Construction and Demolition Sites

Question 5

IP2X (2 Marks)

Clause 2.7.7(a) (2 Marks)

Question 6

0.6m below the lowest point of the overhead electrical cables or lower (2 Marks)

Clause 2.5.6(b) (2 Marks)

Electricity Safety (General) Regulations 2019

Question 7

No (2 Marks)

Clause 207(2)(a) (2 Marks)

Electric Shock Survival

Question 8

Observe chest movement (2 Marks)

Listen and feel for breathing (2 Marks)

Cable Selection

Question 9

Part (i)

Table 3(4) Item 4 (1 Mark)

Table 13 Col 25 (2 Marks, one for table and one for column)

Derating Table 26(2) Col 3 Factor 0.93 (1 Mark)

Derating Table 28(2) Col 3 Factor 0.97 (1 Mark)

Part (i) Answer: 50mm2 (2 Marks)

Part (ii)

Derating Table 26(2) Col 2 Factor 0.90

Part (ii) Answer: 70mm2 (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

Question 10

I = 4A (2 Marks)

VT = 240V (2 Marks)

PT = 1920W (2 Marks)

(Deduct 1 mark for no or incorrect units.)

Maximum Demand

Question 11

Table C1 Column 2 (1 Mark)

Domestic Residence

Equipment	Load Group	Calculation	Maximum Demand	
10A Socket outlets **36 Points total**	B(i)	10A for 1-20 points and 5A for each additional 20 points = 15A	15A	(1 Mark)
2 15 A socket outlets	B(ii)	10A	10A	(1 Mark)
16 A electric vehicle charger **2 outlets total**	J(iv)	Full Connected Load 16A	16A	(1 Mark)
Lights **48 Points Total**	A(i)	3A for 1-20 points and 2A for each additional 20 points = 7A	7A	(1 Mark)
4.3kW air conditioner	D	75% connected load 4300/230= 18.7 x 0.75= 14A	14A	(2 Marks)
		Total Maximum Demand:	62A	(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 Mains

Table 41 Column 6 (1 Mark)

Vc 1.12 (1 Mark)

Vd 1.82 (1 Mark)

Sub-mains

Table 41 Column 6 (1 Mark)

Vc 1.55 (1 Mark)

Vd 2.6 (1 Mark)

Final Sub-circuit

Table 42 Column 4 (1 Mark)

Vc 3.67 (1 Mark)

Vd 1.93 (1 Mark)

Total Voltage Drop = 1.82+2.52+1.93=6.27V (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 = 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)

Question 14

Transformer impedance

230/18,850 (2 Marks)

0.01220Ω (1 Mark) Answer must be to 5 decimal places.

Main switchboard prospective fault

230/ (0.01220 +0.0068) (2 Marks)

12105A (1 Mark)

Distribution board prospective fault

230/ (0.01220 + 0.0068+ 0.037) (2 Marks)

4107A (1 Mark)

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

Residual Current Devices

Question 15

35A (1 Mark)

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

Motor and Starters

Question 16

B (2 Marks)

AS/NZS 4836:2011

Question 17

Positively identified (2 Marks)

Clause number: 3.2.2 (2 Marks)

Installation Defects - Non Domestic

Question 18

(2 marks for correct defect one mark for the correct clause)

(Only accept the first 5 defects candidate has listed)

1. Consumers' mains are not installed in a manner to maintain supply when exposed to fire 7.2.2.1
2. The cable to the distribution board is undersized – 3.4.1
3. Main switch distribution board not labelled 'Main Switch' not labelled – 2.3.3.5(b)
4. The main neutral connection at the neutral bar is not labelled – 2.10.5.4
5. The telecommunications earthing conductor is undersized, 6mm2 minimum - 5.6.2.7 (iv)
6. Main switch fire pump not labelled 'IN THE EVENT OF FIRE DO NOT SWITCH OFF' 7.2.4.4(b)
7. 'Main switch fire pump' label not in uppercase 7.2.4.4(a)
8. Strip earth electrode not at minimum horizontal length 5.3.6.3(i)
9. Strip earth electrode not at minimum depth 5.3.6.3