

Licensed Electrician's Theory (LET) Assessment Sample Paper (2023)



Candidate Surname	
Candidate Given Names	

Reference Material

- AS/NZS 3000:2018 Wiring Rules
- AS/NZS 3012:2019 Electrical installations – Demolition and Construction sites
- AS/NZS 3008.1.1:2017 Electrical installations – Selection of cables
- Electricity Safety (General) Regulations 2019
- AS/NZS 4836:2011 Safe working on or near low voltage electrical installations and equipment

Instructions

- Personal notepads and paper are not permitted.
- Pens only must be used. Answers in pencil may not be marked.
- Do not remove any sheets from this assessment paper or the room.
- Papers with no name or signature will not be marked.
- Units must be shown to obtain full marks.

Results

Candidates need to obtain 75% or more to pass this assessment. If a mark of 74% or less is achieved, a minimum of 14 days is required before you are permitted to re attempt the assessment.

I, the above named candidate confirm:

- I understand the instructions provided to me.
- I do not have any unauthorised materials in my possession.
- I have not attempted the Licensed Electrician's Theory Assessment at any venue within the past 14 days.

Candidate	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Print name	Signature	Date

Working Time: 2 hours and 15 minutes

At the end of this time you will be asked to stop.

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
Mark																			

Final Percentage	Pass/Fail

Supervisor	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Print name	Signature	Date
Assessor	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Print name	Signature	Date
Reviewed by (If necessary)	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Print name	Signature	Date

AS/NZS 3000 WIRING RULES

In the following **four** Wiring Rules questions:

- You are required to write the Wiring Rules Clause and/or Table number in the space provided.
- The correct Wiring Rules Clause and Sub-Clause must be given, e.g. 3.5.2(b)(i).

The correct answer to both parts must be given to obtain full marks.

Question 1. What colour sleeving shall be used when alterations or repairs are made to existing bare or green coloured conductors?

.....
.....

Wiring Rules Clause Number: [2 + 2 = 4 marks]

Question 2. What is the recommended maximum length of cable equipment wiring?

.....
.....

Wiring Rules Clause Number: [2 + 2 = 4 marks]

Question 3. The location of an earth electrode is to be separated from conductive enclosures of other buried services, such as water, gas, telecommunications and flammable liquid, in order to reduce what?

.....
.....
.....
.....
.....

Wiring Rules Clause Number: [2 + 2 = 4 marks]

Question 4. When shall mandatory tests be carried out on an electrical installation?

.....
.....

Wiring Rules Clause Number: [2 + 2 = 4 marks]

AS/NZS 3012 CONSTRUCTION AND DEMOLITION SITES

In the following **two** AS/NZS 3012 questions:

- You are required to write the Standard's Clause number and/or Table number in the space provided.
- The correct Clause and Sub-Clause number must be given. e.g. 2.10.2 (f).

The correct answer to both parts must be given to obtain full marks.

Question 5. What is the maximum length of a single phase 16A cord extension set using 2.5mm² conductors for general use?

.....
Standard Clause Number: [2 + 2 = 4 marks]

Question 6. A portable luminaire shall be provided with a minimum degree of protection of?

.....
.....
.....
Standard Clause Number: [2 + 2 = 4 marks]

ELECTRICITY SAFETY (GENERAL) REGULATIONS 2019

In the following Regulation question, you are required to:

- Write your answers on the line/s below each question.
- Write the complete Regulation and Sub-Regulation number, if applicable, in the space provided, e.g. 401(e)(3).

The correct answer to both parts must be given to obtain full marks.

Question 7. What is the minimum insulation resistance on a length of 39 m. of underground consumer's mains?

.....
Regulation Number: [2 + 2 = 4 marks]

ELECTRIC SHOCK SURVIVAL

Question 8. List two types of material that should not be used to remove someone from contact with live electrical conductor, explain why you wouldn't use these materials?

1. _____
2. _____

[2 + 2 = 4 marks]

CABLE SELECTION

Question 9.

TWO three-core V90 insulated and sheathed copper cables, including earthing conductors, are connected in parallel to supply a three-phase distribution board with a total maximum demand of 200A. The cables are spaced 0.15m apart and protected by a circuit breaker and installed buried direct at a depth of 0.6m.

- (i) Neglecting voltage drop, what is the minimum cable size which can be installed for this circuit?
- (ii) If the cables were touching instead of spaced, what is the minimum cable size which can be installed for this circuit?

All calculations including the final answer must be completed to a maximum of **two decimal places**.

Table details and units must be shown below to obtain full marks. Part (ii) is over the page.

Part (i)

	Answer		Answer
Table 3 (_____?)		Item	
Table		Column	
Derate/rating table		Column	Factor
Derate/rating table		Column	Factor

Part (i) Answer: _____

Question 9. Part (ii)

	Answer		Answer		Answer
Derate/rating table		Column		Factor	

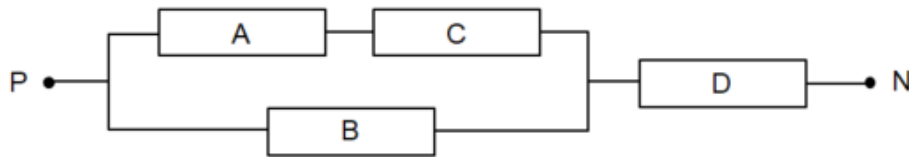
SAMPLE

Part (ii) Answer:

[1 + 2 + 1 + 1 + 2 + 1 = 8 marks]

DC CIRCUITS

Question 10.



The following values apply to the diagram above:

The total current in the circuit is 10A

A is 150V B is 5A C is 30Ω and D is 1000W

Calculate:

- (i) the current flowing through resistor C
- (ii) the value of resistor B
- (iii) the total power dissipated by the circuit

All calculations including the final answer must be completed to a maximum of **two decimal places**.

(i) Current:

(ii) Voltage:

(iii) Power:

[2 + 2 + 2 = 6 marks]

VOLTAGE DROP

Question 12.

In a 400/230V, three-phase commercial installation, a three-phase power factor corrected 19A appliance which operates continuously is supplied from a sub-circuit originating at a distribution board.

All the cables are:

- X90 copper conductors
- protected by circuit breakers
- laid flat and not installed with other cables

The circuit details are:

Consumer Mains - Single Double Insulated

MD current	115A
Length	35m
Size	35mm ²

Sub-mains - Single Double Insulated

MD current	56A
Length	30m
Size	25mm ²

Final sub-circuit - multi-core cable with circular copper conductors

Length	25m
Size	4mm ²

The Consumer Mains and Sub-mains are operating at their normal operating temperatures.

The final sub-circuit cables have an operating temperature of 45°C.

Calculate the total voltage drop from the point of supply to the appliance terminals.

All calculations including the final answer must be completed to a maximum of **two decimal places**.

All relevant table details, calculations and units must be show to obtain full marks.

Cable	Table	Column	Vc	Calculation	Vd
Consumer Mains					
Sub-mains					
Final Sub-circuit					

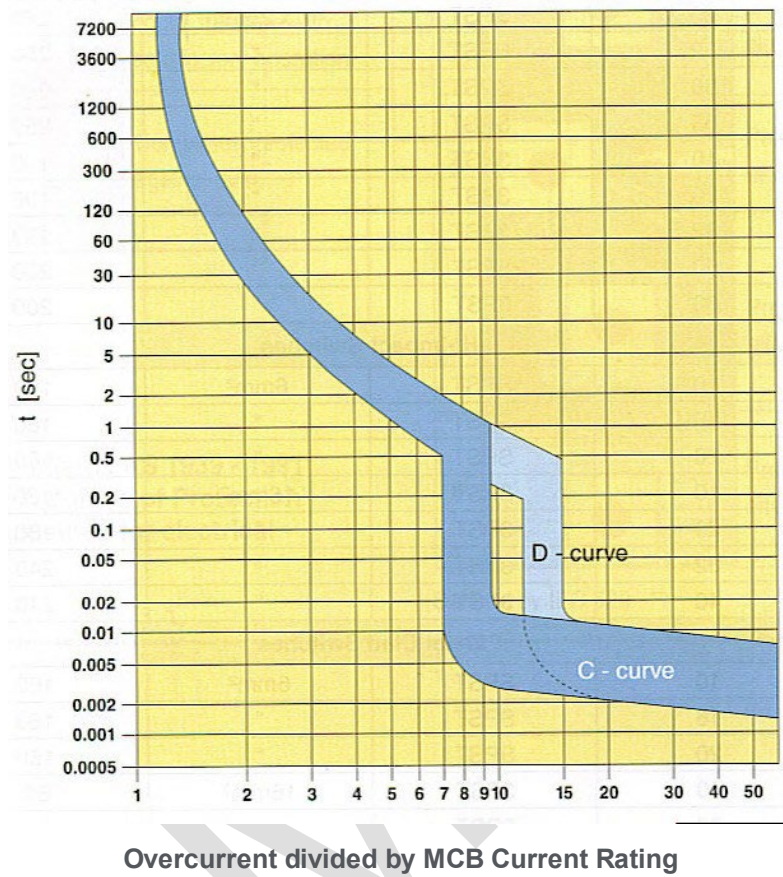
Answer Total Voltage Drop:

[1+1+1+1+1+1+1+1+1+1 = 10 marks]

OVERLOAD AND SHORT CIRCUIT CALCULATIONS

Question 13.

What are the minimum and maximum tripping times for a 40A Type D miniature over-current circuit breaker which is subjected to an over-current of 120A?



Overcurrent divided by MCB current rating:	
Minimum time:	
Maximum time:	

[1 + 1 + 1 = 3 marks]

OVERLOAD AND SHORT CIRCUIT CALCULATIONS

Question 14.

The main switchboard of a 400/230V industrial installation is directly supplied from a 500KVA transformer which has a prospective fault current of 16,650A per phase.

Sub-mains supply a distribution board from the main switchboard.

The following information is known:

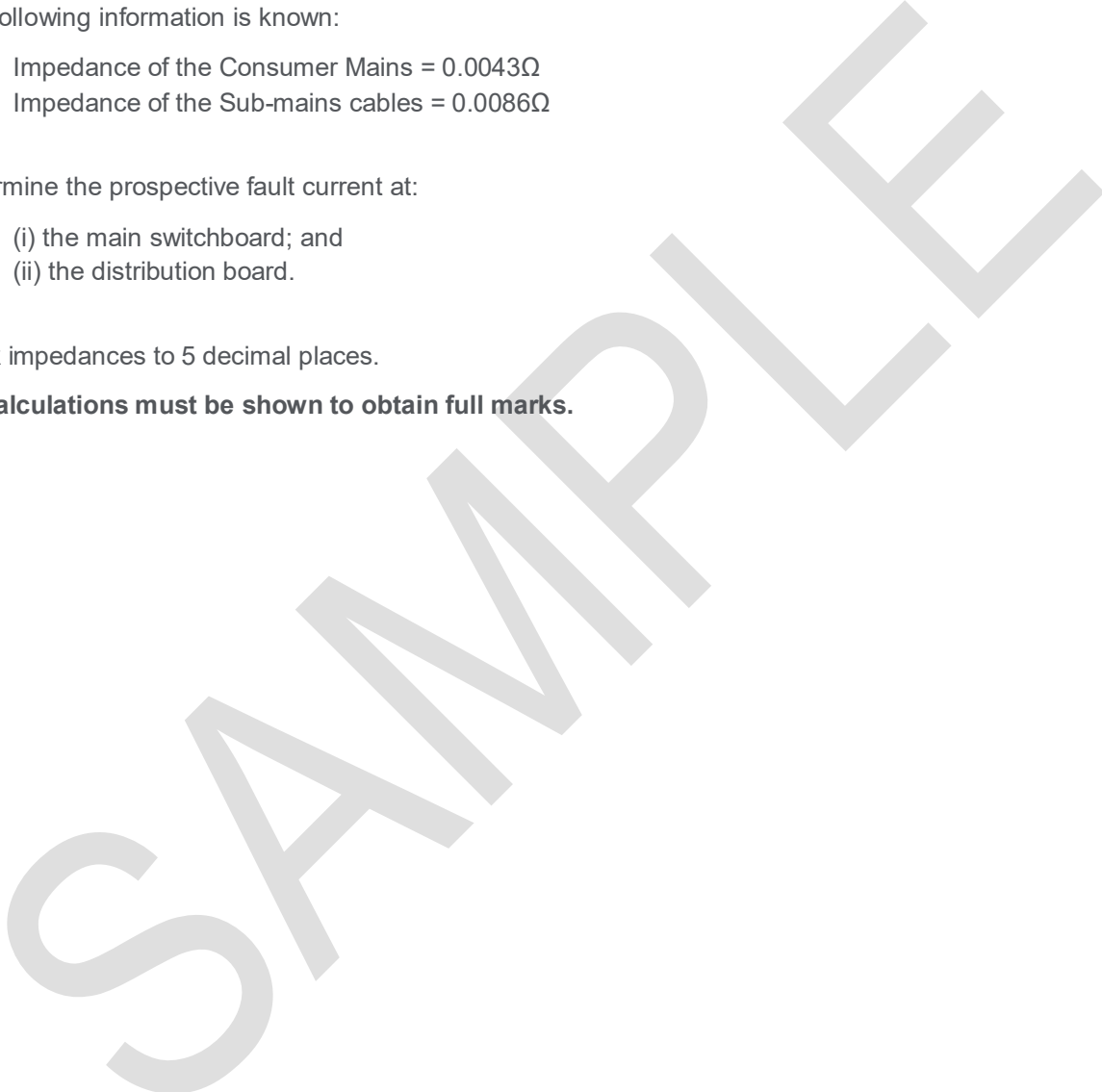
- Impedance of the Consumer Mains = 0.0043Ω
- Impedance of the Sub-mains cables = 0.0086Ω

Determine the prospective fault current at:

- (i) the main switchboard; and
- (ii) the distribution board.

Work impedances to 5 decimal places.

All calculations must be shown to obtain full marks.



Transformer Impedance:	
Main Switchboard:	
Distribution Board:	

[(2+1) + (2+1) + (2+1) = 9 marks]

RESIDUAL CURRENT DEVICES

Question 15.

Do RCDs provide protection for a person who is connected across:

- Active and Earth? Yes / No
- Phase and Phase? Yes / No
- Active and Neutral Yes / No

MOTORS AND STARTERS

Question 16.

CIRCLE the letter in front of the statement you consider to be the most correct.

On start-up, a 3 phase 400V squirrel cage induction motor with an automatic star/delta starter:-

- A. A starts on half the line voltage (200V).
- B. B changes to delta connection at about 80% of the motor's full rated speed.
- C. C has a starting torque three times that of the DOL starting torque.
- D. D has a starting current one half of the DOL current.

[2 marks]

AS/NZS 4836:2011

Question 17.

This question relates to AS/NZS 4836:2011.

If a person is required to work within ? m of an energised exposed conductors or parts, a competent person shall?

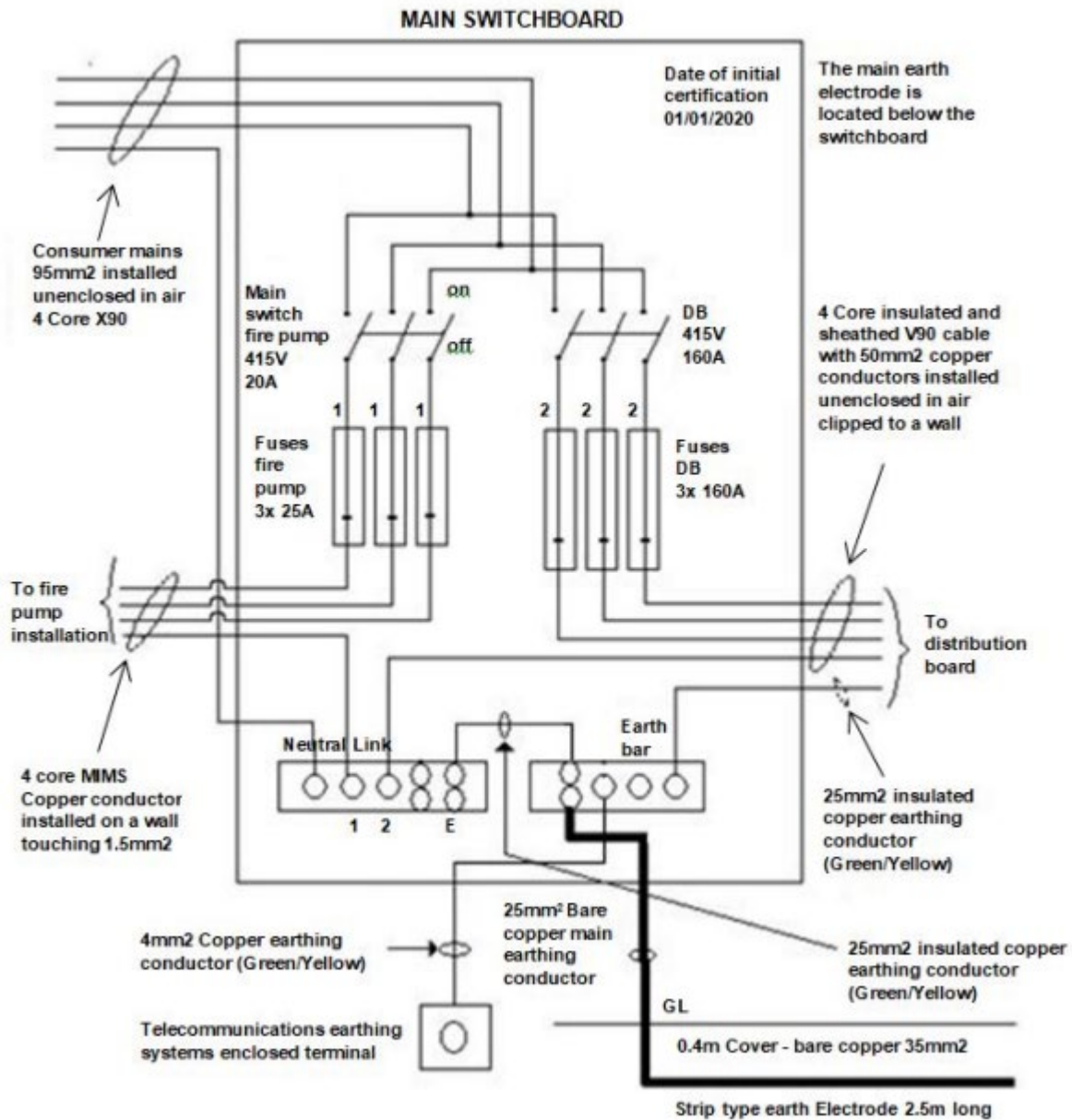
.....
.....

Standard Clause Number:

[2 + 2 = 4 marks]

INSTALLATION DEFECTS - NON DOMESTIC

Question 18.



The drawing above shows the MAIN SWITCHBOARD of an industrial installation originating at the consumer’s mains and contains contraventions to the Wiring Rules.

It supplies a distribution board having a connected load with a calculated maximum demand of 160A per phase and an automatically controlled 3 phase fire pump motor having a current rating of 20A per phase. The fire pump is not required to be RCD protected.

The multi-core MIMS cables are installed spaced from the wall and are 1/1 kV cables. The supply authority has provided short circuit protection for the consumer’s mains.

The safety services main switch and the main switch for the general electrical installation are separated by a metal partition.

All screws in bars or links are all 80% of the tunnel diameter.

Question 18. Continued.

Assume the MIMS cables are earthed in accordance with the Wiring Rules and are capable of maintaining supply to the equipment even when exposed to fire and mechanical damage.

All fuses shown are HRC type.

Complete the table below.

Use the diagram on the previous page.

List **FIVE different defects** together with the contravened Wiring Rules Clause/Table number in the table provided below.

Note: Only the first five defects will be considered.

DEFECT DETAILS	WIRING RULE CLAUSE/TABLE No.

[5 x (2 + 1) = 15 marks]

APPENDIX L
ELECTRIC SHOCK SURVIVAL—Australia

A

EMERGENCY !—Electric shock may cause cardiac arrest.

DANGERS

Check for your own safety and the safety of the casualty and bystanders.

HIGH VOLTAGE—Wait until the power is turned off.

LOW VOLTAGE—Immediately switch off the power. If this is not practicable, pull or push the casualty clear of the electrical contact using material, such as wood, rope, clothing, plastic or rubber. Do not use metal or anything moist.

RESPONSIVENESS

Check for response (verbal and tactile stimuli), touch and talk.

SEND/Shout FOR HELP

Send a bystander to DIAL 000 Ambulance

If available send for Automatic External Defibrillator (AED)

If alone shout for help.

AIRWAY Place the casualty on his/her back.

Tilt the head back and raise the chin forward.

BREATHING Check for normal breathing, observe chest movement, listen and feel for breathing.

Give two initial breaths.

In the absence of normal breathing, if no one has gone for help, place casualty in recovery position and go for help.

CIRCULATION

Position hands on centre of the chest.

Give 30 chest compressions followed by 2 breaths. Depress breastbone 1/3 the chest depth (approx 4 cm or 5 cm) at the rate of 100 compressions a minute.

As soon as available attach AED and follow its instructions.

Continue CPR, 30 compressions: 2 breaths.

When casualty's normal breathing returns cease resuscitation and move the casualty into the **recovery** or **coma** position.

Keep a constant watch on the casualty, to ensure that they do not stop breathing again, until trained assistants take over.

This information is provided for guidance only. It is recommended that persons associated with the installation of electrical equipment or repair of electrical installations obtain Australian Resuscitation Council approved training in current resuscitation methods.