

Licensed Electrician's Practical (LEP) Assessment Sample Paper Marking Guide (2023)



Question 1 - Meter Panel and Switchboard Wiring

The installation is a 3 Phase factory/office premises situated at 23 Time Road, Hivesville. All final sub-circuits must be RCD protected.

The following equipment is to be installed at the **main switchboard**:

- 1 - 3Φ 18A pump motor, 400V control, wired to an external enclosure
- 1 - 1Φ 4.8kW conveyer motor
- 15 - 230V 150W LED luminaires, installed over two circuits. Both circuits are to be installed on the same phase.
- 3 - Double socket outlets installed over two circuits. Both circuits are to be installed on the same phase.
- 1 - 230V 2.4kW electric vehicle charger

The following equipment is to be installed from the **distribution board** and controlled by an isolator:

- 12 - 230V 15W LED lights installed on one circuit
- 1 - 230V 12A Reverse Cycle Air Conditioning Unit
- 4 - 230V 10A double socket outlets installed on one circuit
- 1 - 230V 4A instantaneous water heater

Table C2 Column 3

| Circuits | Load Group | Calculations | MD | | |
|----------------------------------------------------|------------|-------------------------------------------------------------------------------------------------------|-------|-------|------|
| | | | Red | White | Blue |
| 1 - 3Φ 18A pump motor | (d) | Full connect load Except in phase where motor A is higher, therefore $18A \times .75 = 13.5A$ | 18 | 13.5 | 18 |
| 1 - 1Φ 4.8kW conveyer motor | (d) | Full connect load $4.8kW/230V = 20.86A$ (highest load on phase) | | 20.86 | |
| 15- 230V 150W LED luminaires all on the same phase | (a) | Full connected load $15 \times 150/230 = 9.78A$ | | 9.78 | |
| 3 - 230V 10A double socket outlets | (b) (i) | 1000W for first outlet plus 750W for each additional outlet $1000 + (750 \times 3) / 230 = 14.13A$ | 14.13 | | |
| 1 - 230V 2.4kW electric vehicle charger | (c) (ii) | Full connect load $3.6kW/230V = 10.43A$ | 10.43 | | |
| Equipment 1Φ Distribution Board | | | | | |
| 12 - 230V 18W LED lights | (a) | Full connected load $12 \times 18 / 230 = .94A$ | | | .94 |
| 1 - 230V 12A Reverse Cycle Air conditioning unit | (c) (i) | Full connect load 12A | | | 12 |

| | | | | | |
|-----------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------|--------|--------|--------|
| 4- 230V 10A Double socket outlets | (b) (ii) | 1000 W for first socket-outlet, plus 100 W for each additional outlet 1000 W + (7 x 100 W) /230 = 7.4 A | | | 7.39 |
| 1 – 230V 4A instantaneous water heater | (c) (i) | Full connected load 4A | | | 4 |
| Distribution Board MD | | | | | 24.33A |
| Total Installation MD | | | 42.56A | 44.14A | 42.33A |

AS/NZS 3008.1.1

| | | |
|---------------------------|----------|-----------------------------|
| Consumers Mains | Table 7 | Column 15 (O/H) or 24 (U/G) |
| Sub-main | Table 4 | Column 15 |
| Three phase load | Table 7 | Column 15 |
| Single phase loads | Table 10 | Column 15 |

| Maximum Demand of the Installation | Current Rating of the Main Switch | Size of the Consumers Mains Cable | | Size of the Main Earth Conductor | |
|------------------------------------|-----------------------------------|-----------------------------------|-------------------|----------------------------------|------------------|
| | | O/head | U/G | O/head | U/G |
| 44.14A | 50A | 16mm ² | 10mm ² | 6mm ² | 4mm ² |

| Maximum Demand of the Distribution Board | Current Rating of the Distribution Board Sub-main Circuit Protection | Size of the Sub-main Cable |
|------------------------------------------|----------------------------------------------------------------------|----------------------------|
| 24.33A | 25A | 4mm ² |

| Location | Description | Circuit Loading (T.C9) | Circuit Breaker Rating | Cable Size | AS/NZS 3008 |
|--------------------|----------------------------------------|------------------------|------------------------|--------------------|-------------|
| Main Board | 3Φ 18A pump motor | 18A | 20A | 2.5mm ² | T7 C15 |
| Main Board | 1Φ 4.8W conveyer motor | 20.86A | 25A | 4mm ² | T10 C15 |
| Main Board | 15 - 230V 150W LED luminaires | 9.78A | 10A | 1.5mm ² | T10 C15 |
| Main Board | 3 - 230V 10A double socket outlets | 14.3A | 16A/20A | 2.5mm ² | T10 C15 |
| Main Board | 1 Φ 3.6kW electric vehicle charger | 10.43A | 16A/20A | 2.5mm ² | T10 C15 |
| Distribution Board | 12 - 230V 18W LED luminaires | .94A | 10A | 1.5mm ² | T10 C15 |
| Distribution Board | 4 - 230V 10A double socket outlets | 8A | 10A/16A | 2.5mm ² | T10 C15 |
| Distribution Board | 1 - 230V 12A A/C unit | 12A | 16A/20A | 2.5mm ² | T10 C15 |
| Distribution Board | 1 – 230V 4A instantaneous water heater | 4A | 10A | 1.5mm ² | T10 C15 |

Question 1 = 35 marks

Question 2.8 – Testing of Operation of RCDs

Answer: All Actives

Wiring Rules Clause Number: 2.6.2.2.2

1 mark

Question 3.2 - MEN System

1. (c) via the main neutral conductor
2. (a) True
3. (b) Decreases
4. (a) True

(2 + 2 + 2 + 2 = 8 marks)

SAMPLE