

LEP Sample Paper July 2019

Question 1- Maximum Demand & Cable Selection

The installation is a 3 phase air conditioned business premises situated at 37 City Road, Jonesville. **All final sub-circuits must be RCD protected.**

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

- 1 - 3Φ 24A reverse cycle air conditioner, 230V control, wired to an external enclosure
- 1 - 4.7kW range
- 42 - 230V 16W LED luminaires, installed over two circuits. Both circuits are to be installed on the same phase.
- 1 - 1Φ 3.8kW electric vehicle charger

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

- 16 - 230V 10A double socket outlets installed over two circuits
- 40 - 230V 16W LED luminaires on one circuit

MAXIMUM DEMAND CALCULATION

Table C2 Column 3					
Circuits	Load Group	Calculation	MD		
			R	W	B
Main Board					
1 - 3Φ 24A reverse cycle air conditioner	C(i)	FCL of highest rated appliance and 75% of the remainder 24A	24	24	24
1 - 1Φ 4.7kW range	C(i)	FCL of highest rated appliance and 75% of the remainder $4.7W/230V = 20.43A \times 0.75 = 15.32A$	15.32		
42 - 230V 16W LED luminaires all on the same phase	A(i)	Full connected load $(42 \times 16)/230 = 2.92A$	2.92		
1 - 230V 3.8kW electric vehicle charger	C(ii)	FCL $3.8kW/230V = 16.52A$		16.52	
Distribution Board					
16 - 1Φ 10A double socket outlets	B(ii)	1000W for the first socket outlet plus 100W for each additional outlet $(1000 + 31 \times 100)/230 = 17.83A$			17.83
40 - 230V 16W LED luminaires	A(i)	Full connected load $(40 \times 16)/230 = 2.78A$			2.78
		Distribution Board MD			20.61A
		TOTALS	42.24A	40.52A	44.61A

AS/NZS3008.1.1	Table	Column
Consumers Mains:	7	15 (O/H) or 24 (U/G)
Sub main:	4	15
Three phase load:	7	15
Single phase loads:	10	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
44.61A	50A	16mm²	10mm²	6mm²	4mm²

Maximum Demand of the Distribution Board	Current Rating of the Distribution Board Sub-main Circuit Protection	Size of the Sub-Main Cable
20.61A	25A	4mm²

Final Sub Circuits

Location	Description	Circuit Loading (T.C9)	Circuit Breaker Rating	Cable Size	AS/NZS3008
Main board	3 Φ 24A reverse cycle air conditioner	24A	25A	4mm²	T7 C15
Main board	1 Φ 4.7kW range	20.43A	25A	4mm²	T10C15
Main board	21 – 230V 16W LED luminaries	1.46A	10A	1.5mm²	T10C15
Main board	21 – 230V 16W LED luminaries	1.46A	10A	1.5mm²	T10C15
Main board	1 Φ 3.8kW electric vehicle charger	16.52A	20A	2.5mm²	T10C15
Distribution board	8 - 1 Φ 10A double socket outlets	16A	16A/20A	2.5mm²	T10C15
Distribution board	8 - 1 Φ 10A double socket outlets	16A	16A/20A	2.5mm²	T10C15
Distribution board	40 - 230V 16W LED luminaires	2.78A	10A	1.5mm²	T10C15

Note: Candidates are instructed in the paper they may use Appendix C tables. Candidates should not be penalised if they correctly use other valid methods.

Question 3.2

1. (c) via the main neutral conductor
2. a) true
3. b) decreases
4. b) false

SAMPLE