

LEP Sample Paper 2019

Question 1- Maximum Demand & Cable Selection

The installation is a 3 phase air conditioned business premises situated at 37 City Road, Jonesville. **All 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.