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DEPARTMENT OF EXAMINATIONS
THE HALL, SAPIRIA STREET, FLORIANA, MALTA

Examination for Authorisation B

Paper: Practical Test
Date: 3 September 2019
Time: 09:00 – 10:00 (One hour)

Name and Surname: _____
(in block letters)

Index Number: _____

Question

Refer to Table 1 below for suggestion of values concerning the allowances to be considered for diversity.

NOTE: Distribution boards must not have diversity applied so that they can carry the total load connected to them.

The electrical load of a small business shop has the following single-phase loads, which are balanced as evenly as possible across the 400 V three-phase supply:

- 2 x 6 kW thermostatically controlled water heaters
- 7 x 3kW thermostatically controlled water heaters
- 2 x 3 kW instantaneous water heaters
- 2 x 6 kW cooker
- 1 x 4 kW cooker
- 12 kW of discharge lighting (sum of tube ratings).
- 8 x 32 A ring circuits feeding 13 A sockets.

The supply voltage is 400/230 V.

Referring to Table 1:

- a. Calculate the demand for each load. (18 marks)
- b. Calculate the total maximum demand. (6 marks)
- c. Draw a three-phase MCB Board showing how you would distribute the above loads. (10 marks)
- d. Choose a suitable sized incoming MCCB. (6 marks)

Table 1 - Allowance for diversity

Note the following abbreviations:

L is the full load current of the **largest** appliance or circuit

S is the full load current of the **second** largest appliance or circuit

R is the full load current of the **remaining** appliances or circuits

Type of final circuit	Type of premises		
	<i>Households</i>	<i>Small shops, stores, offices</i>	<i>Hotels, guest houses</i>
Lighting	66% total demand	90% total demand	75% total demand
Heating and power	100% up to 10 A + 50% balance	100%L + 75%(S+R)	100%L + 80%S + 60%R
Cookers	10 A + 30% balance + 5 A for socket	100%L + 80%S + 60%R	100%L + 80%S + 60%R
Motors (but not lifts)		100%L + 80%S + 60%R	100%L + 50%(S+R)
Instantaneous water heaters	100%L + 100%S + 25%R	100%L + 100%S + 25%R	100%L + 100%S + 25%R
Thermostatic water heaters	100%	100%	100%
Floor warming installations	100%	100%	100%
Thermal storage heating	100%	100%	100%
Standard circuits	100%L + 40%(S+R)	100%L + 50%(S+R)	100%L + 50%(S+R)
Sockets and stationary equip.	100%L + 40%(S+R)	100%L + 75%(S+R)	100%L + 75%S + 40%R

Total: 40 marks

END OF EXAMINATION PAPER

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