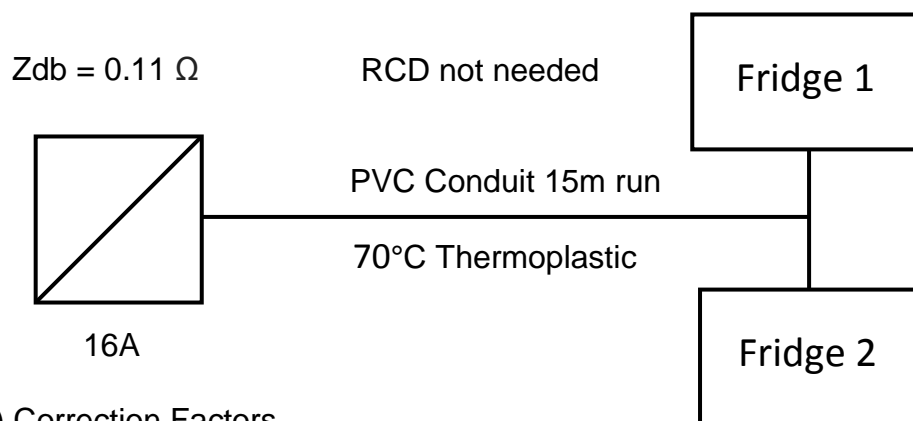


Question number 5:-



1) Correction Factors

- C_g – 2 circuits – 0.94
- C_i – NA
- C_f – NA
- C_a – 35°C - 0.8

2) Length from CCU to fridges measured at 14.15m, so rounded up to 15m for convenience.

3) I_b determined at 16A

4) Overload – No overload protection needed as fridge I_n the same as I_b

5) 16A I_n

6) 2 circuits $C_g = 0.94$ and $C_a = 0.8$ so, $I_z = \frac{I_b}{C_g \times C_a} = 21.3A$

4mm² cable

$I_t = 26A$

16A MCB $Z_s \text{ Max} = 2.73\Omega$

$Z_s = Z_e + ((R_1 + R_2) \times L \times 1.2)$

$$= 0.11 + (12.02 \times 10^{-3} \times 15 \times 1.2) = 0.32\Omega$$

Meets disconnection criteria for 0.4 of a second.

Check minimum CPC CSA using adiabatic equation.

First find fault current = $IPF = \frac{V}{Z_s} = \frac{230}{0.326}$ so $IPF = 705A$

$$S(\text{mm}^2) = \frac{\sqrt{I^2 t}}{k} = \frac{\sqrt{700^2 \times 0.1}}{115} = 1.9\text{mm}^2 \text{ so CPC is satisfactory.}$$