



12 Pages

1. Please give the information requested in the boxes below.
2. Enter your name in the space provided to the right, fold over and seal down (using the label provided) to hide your name.
3. The answers must be legibly written. The Examiners can either ignore illegible script or have it typed and the expense of typing charged to the candidate.
4. Write your answers in ink.
5. Begin each answer on a fresh page. Do all rough work in the answer book and cross it through.
6. No part of this book is to be torn out; it must be handed in complete.
7. If more books than one are used, fasten them together using the tags available from the invigilator(s).
8. **Every book must be handed in. In no circumstances may answer books, used or unused, be taken out of the examination venue.**

1	Student Number	RIC22869222
2	Title of Examination Paper	Design of electrical installation
3	Module Code	GCEE 4001
4	Date and Time of Examination	7/4/24 11:30
5	Examination Venue	68860 ward 2.
6	Seat Number	B2
7	Number of Answer Books handed in	

[illegible]

Caitlyn

32%

A handwritten signature in blue ink, appearing to be "M. M." or similar, located at the bottom right of the page.

1

$$a). \quad N = \frac{E \times A}{f \times U_f \times m_f} \quad \checkmark \quad = \frac{370 \times 560}{16000 \times 0.8 \times 0.7} \quad \checkmark$$

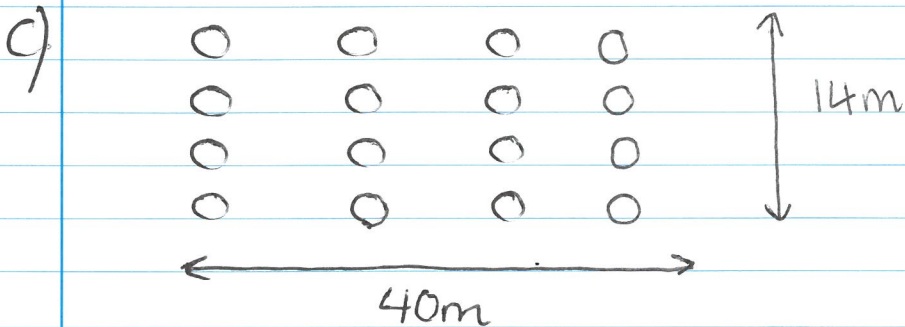
$$= 16.1 \quad \times$$

= 17 lamps.

(2)

$$b). \quad = \frac{L}{d^2} \quad \checkmark = \frac{8000}{8^2} \quad \checkmark = 125 \text{ lux} \quad \checkmark$$

(3)



(1)

Q1

6
10
✓

2.

a). 8m 2bends.

$$6 \times 1.5 = 9$$

$$6 \times 2.5 = 15$$

$$12 \times 6 = 72$$

$$12 \times 10 = 120$$

$$\frac{216}{\times 120} 36.3 = 7840.8 \text{ mm}$$

Incorrect factors used
throughout.

(b)

= $200 \times 100 \text{ mm}^2$ trunking.

b). $10 \text{ mm}^2 \div 12 = 8.33$

(b)

Q2

0/5
✓

3.

$$a) = \sqrt{(I_a^2 + I_b^2 + I_c^2) - (I_b \times I_b) - (I_b \times I_c) - (I_a \times I_c)} \quad \checkmark$$

$$= 150A = I_a$$

$$= 200A = I_b$$

$$= 60A = I_c. \quad \checkmark$$

(6)

$$= \sqrt{(150^2 + 200^2 + 60^2) - (150 \times 200) - (200 \times 60) - (150 \times 60)} \quad \checkmark$$

$$= \sqrt{(66100) - (30000) - (12000) - (9000)} \quad \checkmark$$

$$= 122.88A \quad \checkmark$$

b) N/A

(0)

c)

(0)

Q3

6/10

✓

4.

$$P = \frac{V}{A} = I = P/V = \frac{39}{230} =$$

$$I_n = 39A \checkmark = 40 \text{ Amp breaker} \checkmark$$

$$\frac{40}{C_a \times C_i} = \frac{40}{1.20 \times 0.80} = 41.66$$

$$0.94 = 35.16$$

$$= 10 \text{ mm}^2$$

$$= \frac{(m/V/a) \times I_n \times \text{length}}{1000} = \frac{\times 40 \times 20}{1000}$$

$$= \frac{(R_1 + R_2) \times I_n \times \text{length}}{1000} = \frac{3.66 \times 40 \times 20}{1000} = 2.92$$

$$= (R_1 + R_2) + Z_e = 2.92 + 0.58 = 3.508$$

$$Z_s = 3.508 \Omega$$

$$S = \frac{\sqrt{I^2 t}}{k} = \frac{\sqrt{40^2 \times 0.1}}{115} = 0.109 \text{ mm}^2$$

(3)

Q4

3/15

✓

5.

$$a) I_f = \frac{VOC}{Z_s} = \frac{230}{?}$$

$$(R_1 + R_2) + Z_e = Z_s = ? + 0.35 \Omega$$

$$R_1 + R_2 = \frac{(R_1 + R_2) \times l \times \text{length}}{1000}$$

Correct method used,
incorrect values used.

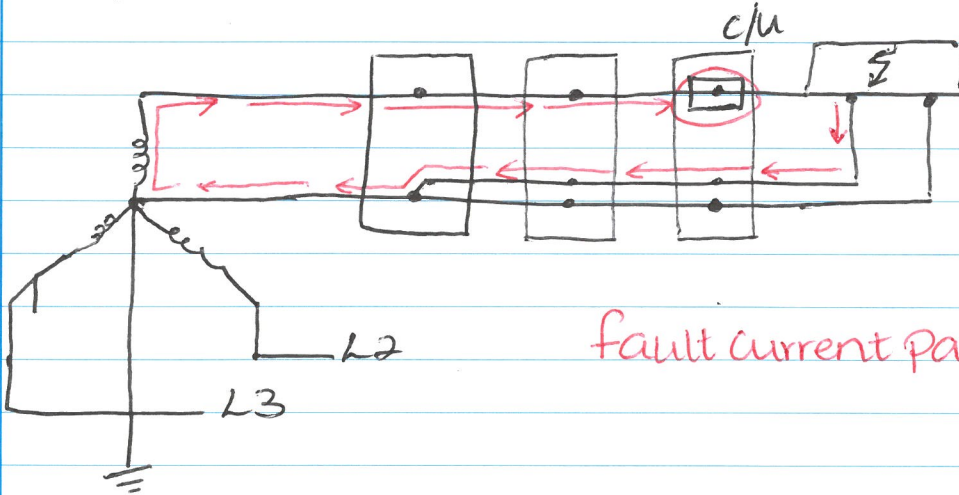
$$= 10 \text{ mm}^2 = \frac{3.66 \times 40 \times 30}{1000} = 4.392$$

$$R_1 + R_2 = 4.39$$

$$4.39 + Z_e = 4.39 + 0.35 = 6.27$$

$$\frac{230}{6.27} = 36.68$$

b.



Fault current path.

(1)

Q5

1/10

✓