



Examination Answer Books

12 Pages

Instructions to Candidates

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.

Complete, fold and seal
(see note 2 below)

SURNAME:

IRWIN

FORENAME(S):

MATTHEW

1	Student Number	IRW18846726
2	Title of Examination Paper	ELECTRICAL AND ELECTRONICS PRINCIPLES
3	Module Code	GOEE4003
4	Date and Time of Examination	MAY 16 2022 9.30
5	Examination Venue	GOWER COLLEGE SWANSEA WARD 2
6	Seat Number	

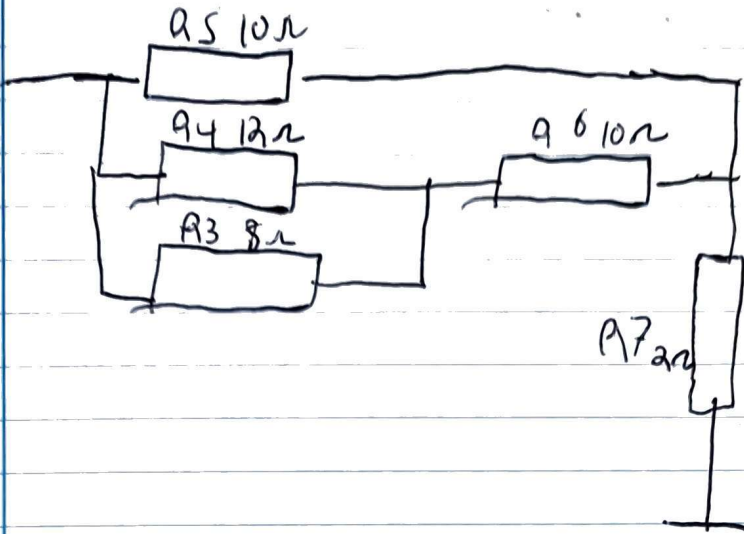
7	Number of Answer Books handed in	
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List the numbers of the questions you have attempted	Office Use
Q1	18
Q2	9
Q3	11
Q4	6
Total	44/100

44%
✓ Kof

Q1

i)



Q1

18/25~~Q1~~

$$R_{3,4} = \frac{R_3 \times R_4}{R_3 + R_4} = \frac{8 \times 12}{8 + 12} = \frac{96}{20} = 4.8\Omega$$

$$R_{3,4,6} = R_{3,4} + R_6 = 4.8 + 10 = 14.8\Omega$$

$$R_{3,4,6,5} = \frac{R_{3,4,6} \times R_5}{R_{3,4,6} + R_5} = \frac{14.8 \times 10}{14.8 + 10} = \frac{148}{24.8} = 5.96\Omega$$

$$R_T = R_{3,4,6,5} + R_7 = 5.96 + 2 = 7.96\Omega$$

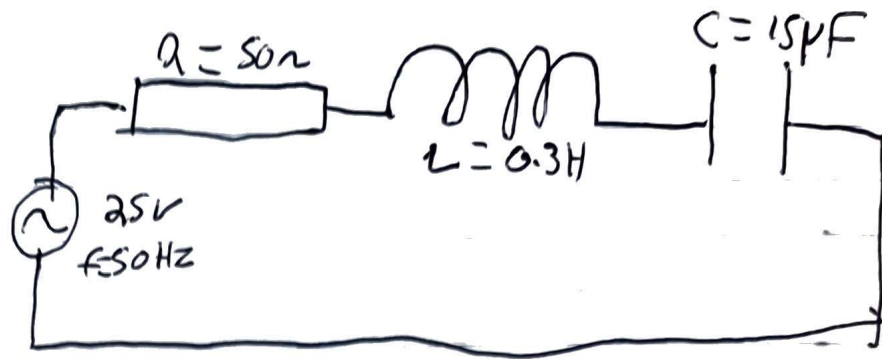
$$ii) \quad V = \frac{P}{I_T \times R_T} = \frac{(8-54) \times 7.96}{3 \times 7.96} = 23.88$$

$$V = 23.88V$$

$$iii) \quad P = \frac{I^2 R}{3^2 \times 7.96} = 9 \times 7.96 = 71.6W$$

Q 2

i



$$X_L = 2\pi fL \checkmark$$

$$X_L = 2\pi \times (50) \times (0.3) = 94.24 \Omega \checkmark \underline{\underline{3}}$$

$$ii \quad X_C = \frac{1}{2\pi fC} \checkmark$$

$$X_C = \frac{1}{2\pi \times (50) \times (15 \times 10^{-6})}$$

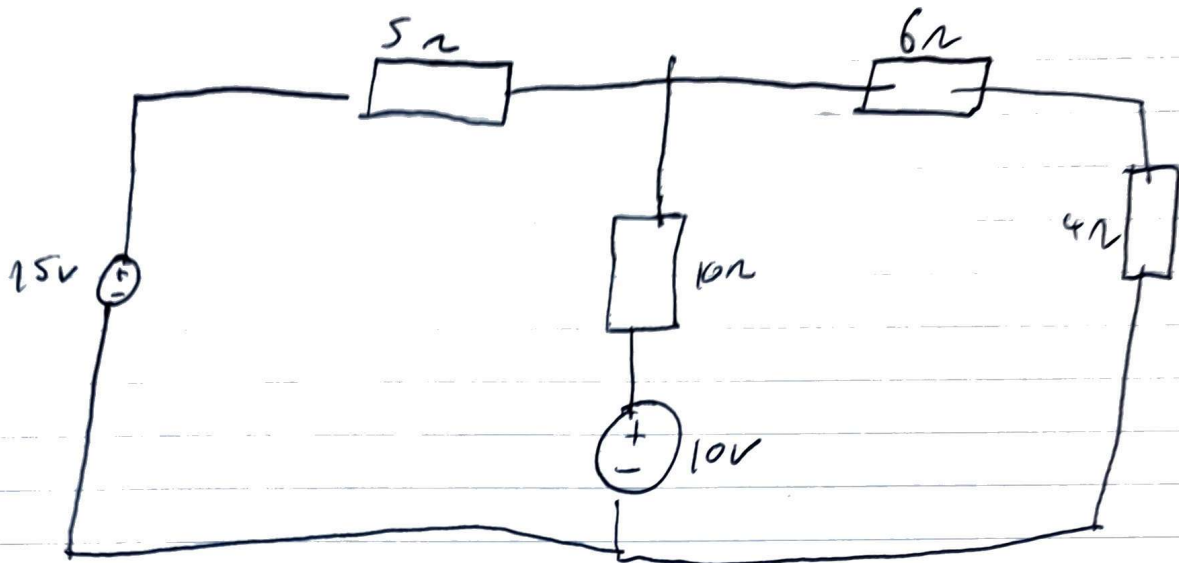
$$= 212.2 \Omega \checkmark \underline{\underline{3}}$$

$$\begin{aligned}
 iii \quad Z &= \sqrt{R^2 + (X_L - X_C)^2} \\
 &= \sqrt{(50)^2 + (94.24 - 212.2)^2} \\
 &= \sqrt{(2500) + (117.96)^2} \\
 &= \sqrt{(2500) + (13914.56)} \\
 &= \sqrt{16414.56} \\
 &= 128.12 \Omega \checkmark \underline{\underline{3}}
 \end{aligned}$$

Q2

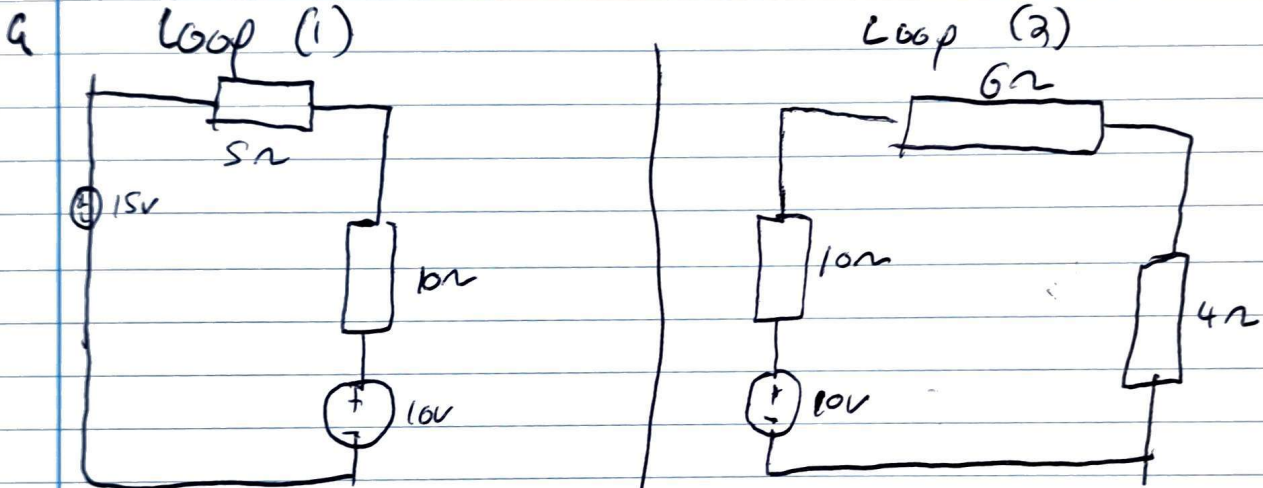
9/15

Q3



Q3a

0/15



$$15 + 5i_1 + 10i_2 + 10 = 0$$

X

$$6i_2 + 4i_2 + 10i_2 = 0$$

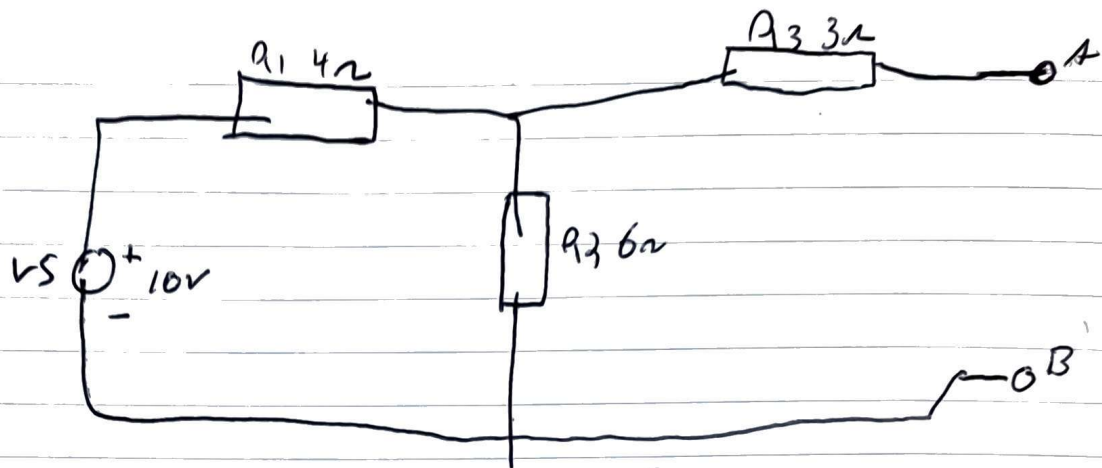
X

0



6

i)

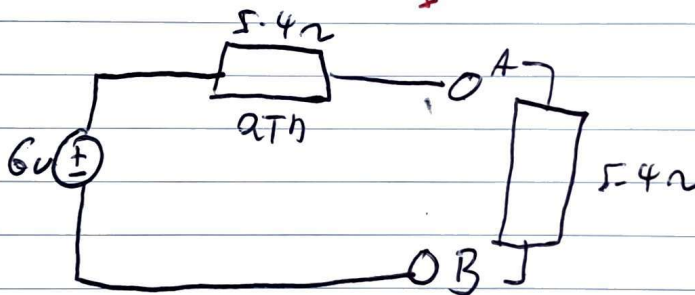


$$V_{Th} = \frac{6}{6+4} \times (10V) = 6V$$

$$R_{Th} = \frac{6+4}{6+4} = \frac{24}{10} + 3 = 5.4\Omega$$

For maximum power transfer $R_L = R_{Th} = 5.4\Omega$

$$R_L = 5.4\Omega$$



Q3b

11/15

Q 4

a)

$$i) \text{ out put} = (A \cdot B + C)D \quad ?$$

C)

$$i) Z = A \cdot (B)^{\sim} + C \quad \checkmark \quad 3/11$$

$$ii) Z = A \cdot (B + \bar{B} \cdot C) \quad \checkmark \quad 3/11$$

Q4 a
0/Q4 b
0/Q4 c
6/6Q4 d
0/