Student name

2024 Mock Exam (Units 3&4)

Question and response book

General Mathematics

Paper 1

Time allowed

Perusal time — 5 minutes

Working time — 90 minutes

General instructions

- Answer all questions in this question and response book.
- QCAA-approved scientific calculator permitted.
- QCAA formula sheet provided.
- Planning paper will not be marked.

Section 1 (15 marks)

- 15 multiple choice questions.

Section 2 (33 marks)

- 10 short response questions.

Section 1

Instructions

- Choose the best answer for Questions 1–15.
- This section has 15 questions and is worth 15 marks.
- Use a 2B pencil to fill in the A, B, C or D answer bubble completely.
- If you change your mind or make a mistake, use an eraser to remove your response and fill in the new answer bubble completely.

	A	B	C	D
Example:	●	○	○	○

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○

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Section 2

Instructions

- Write using black or blue pen.
- Questions worth more than one mark require mathematical reasoning and/or working to be shown to support answers.
- If you need more space for a response, use the additional pages at the back of this book.
  - On the additional pages, write the question number you are responding to.
  - Cancel any incorrect response by ruling a single diagonal line through your work.
  - Write the page number of your alternative/additional response, i.e. See page …
  - If you do not do this, your original response will be marked.
- This section has 10 questions and is worth 33 marks.

DO NOT WRITE ON THIS PAGE

THIS PAGE WILL NOT BE MARKED

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QUESTION 16 (3 marks)

If the local time in location A $(20°N, 15°W)$ is 3:30am, calculate the local time in location B $(10°S, 75°E)$.

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QUESTION 17 (2 marks)

An investor needs to decide on two interest rates for a greater return.

- Option A: 4.66% per annum, compounded monthly.
- Option B: 4.60% per annum, compounded weekly.

Using the effective interest formula, calculate the effective interest rates and compare which option provides a greater return on investment.

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QUESTION 18 (2 marks)

$5,000 is invested each month into an annuity. The annuity has monthly compounding growth of 3.8% *per annum*.

Determine the value of this annuity after 8 years.

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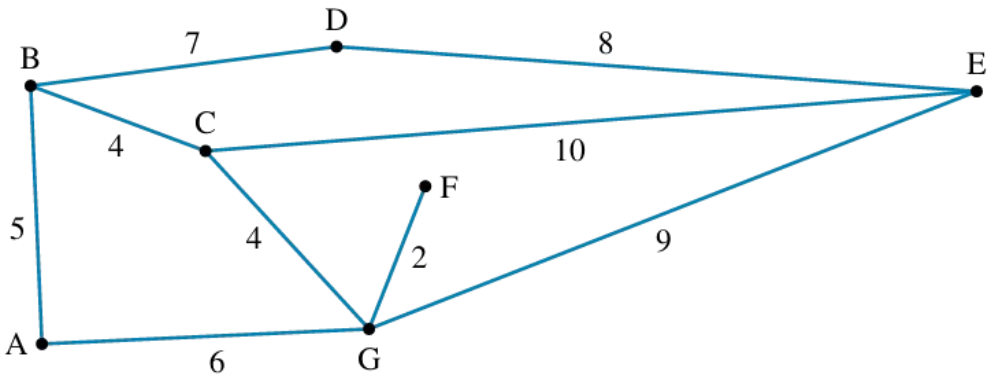
QUESTION 19 (3 marks)

Consider the graph below when completing the question.



Determine the shortest path from A to E and state its length.

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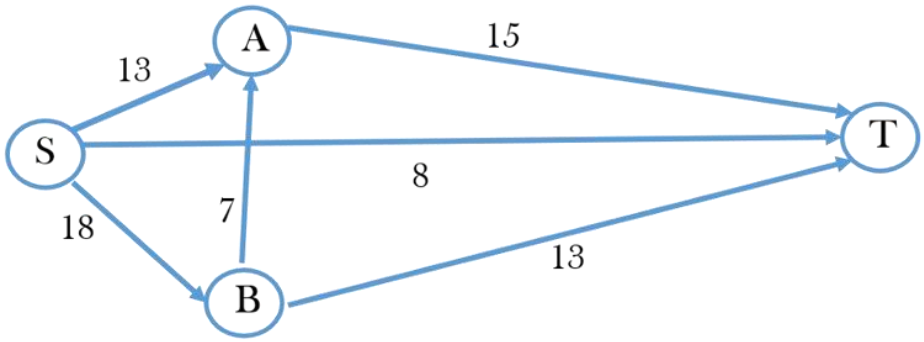
QUESTION 20 (4 marks)

The network below illustrates a series of pipelines, where the units represent the rate of water flow (L/sec).



Use the maximum flow / minimum cut method to determine the maximum flow through the network from source to sink.

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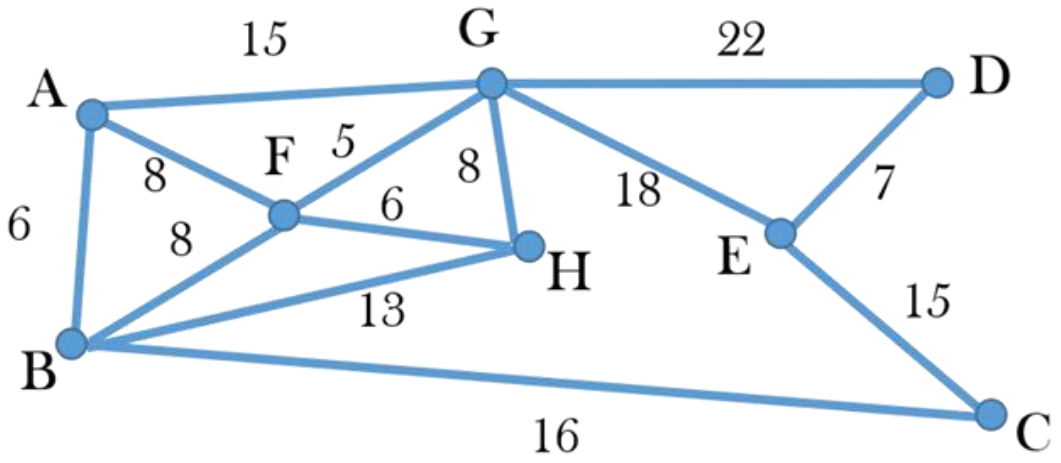
QUESTION 21 (4 marks)

The following network below illustrates the cost per thousand to shelter the walkway between buildings.
Determine the minimum spanning tree, hence calculate the minimised cost of providing shelter between all buildings.



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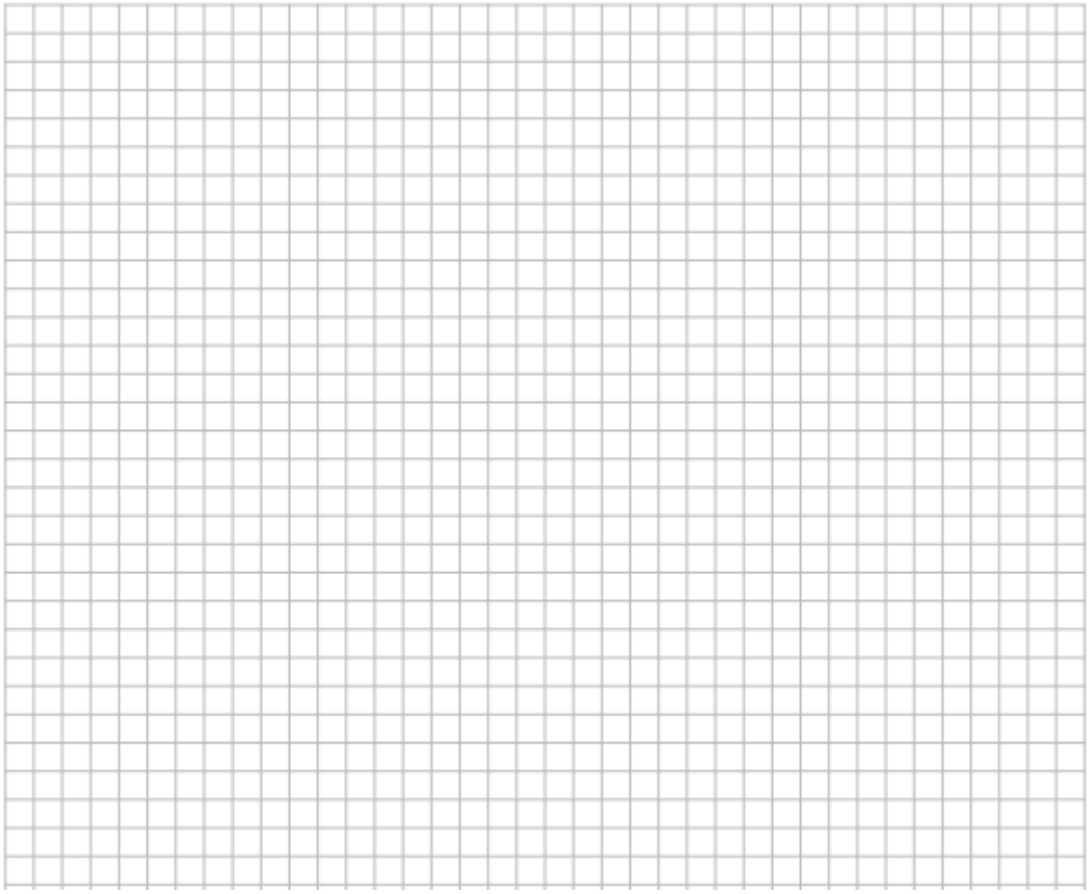
QUESTION 22 (3 marks)

A student's caloric intake is tracked for 9 days, and data is provided in the table below:

Day	1	2	3	4	5	6	7	8	9
Caloric Intake	3115	2855	2900	3510	4275	2935	2200	5885	3100

Construct a time series plot and describe the relationship.



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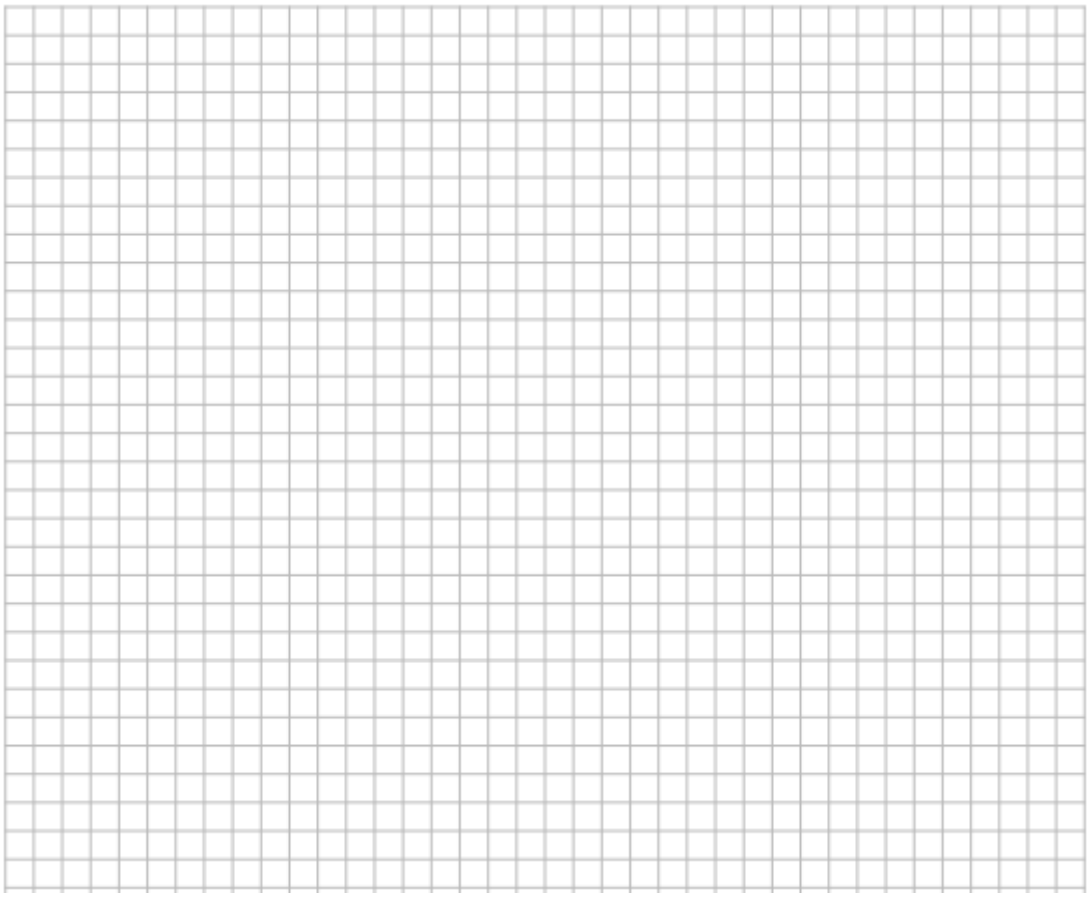
QUESTION 23 (5 marks)

A sequence has been defined as $t_{n+1} = t_n + 4, t_1 = 5$. Determine the rule in the form of $t_{n+1} = t_1 + d(n-1)$. Hence, determine and plot the first 6 terms on the graph below.



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QUESTION 24 (3 marks)

Sarah departs from Brisbane, Australia (UTC +10) on Tuesday at 8:15pm on a flight to Perth, Australia (UTC +12). The flight takes 6 hours and 20 minutes.

Determine the local day and time of arrival.

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QUESTION 25 (4 marks)

David borrows $25 000 from a financial institution on a reducing balance loan of 7.50% per annum, compounding monthly, for 8 years with monthly repayments of $500.95.

Construct the recurrence relation to model this scenario, hence determine the loan amount after 6 months.

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END OF PAPER 1

ADDITIONAL PAGE FOR STUDENT RESPONSES

Write the question number you are responding to.

Do not write outside this box

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Write the question number you are responding to.

Do not write outside this box

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