Affix label with Candidate Code Number here.
If no label, enter candidate Number if known

.....

No. 9196

Plumbers, Gasfitters and Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2021

CERTIFYING GASFITTER

QUESTION AND ANSWER BOOKLET

Time allowed THREE hours

INSTRUCTIONS

Check that the Candidate Code Number on your admission slip is the same as the number on the label at the top of this page.

Do not start writing until you are told to do so by the Supervisor.

Total marks for this examination: 100.

This exam booklet consists of 2 sections

Section A – Question 1 to 12

Section B – Question 1 to 10

The pass mark for this examination is 60 marks.

Write your answers and draw your sketches in this booklet. If you need more paper, use pages 28-31 at the back of this booklet. Clearly write the question number(s) if any of these pages are used.

All working in calculations must be shown.

Candidates are permitted to use the following in this examination:

Drawing instruments, approved calculators, document(s) provided.

Blue or Black pens only.

Publications, Acts, Regulations, Codes of Practice, or Standards other than the ones provided are NOT permitted in the examination room.

Check that this booklet has all of 32 pages in the correct order.

YOU MUST HAND THIS BOOKLET TO THE SUPERVISOR AT THE END OF THE EXAMINATION

USEFUL FORMULAE

Circumference of circle = $2 \times \pi \times R$ or Circumference of circle = $\pi \times D$

Area of circle = $\pi \times R^2$ or Area of circle = $0.7854 \times D^2$

Volume of cylinder = $\pi \times R^2 \times H$ or Volume of cylinder = $0.7854 \times D^2 \times H$

$$\text{Heating time (seconds)} = \frac{\text{mass of water (kg)} \times 4.2 \times \text{temp diff (ºC)} \times 100}{\text{heat energy input per hour (kJ)} \times \text{efficiency (\%)}}$$

$$\text{Correction factor} = \frac{\text{atmospheric pressure + supply pressure}}{\text{atmospheric pressure}}$$

$$\text{Gas rate (m}^3\text{/h)} = \frac{\text{volume (m}^3\text{)} \times 3600}{\text{time (seconds)}}$$

SECTION A

QUESTION 1

(a) A new appliance is to be added to an existing installation.

The installation has an operating pressure of 6.0 kPa.

Name the pressure tests and give the pressure at which each test is required to be performed throughout the course of the installation.

(8 marks)

(b) Give THREE ways that a volume of pipework larger than 30 litres may impact on the purging and testing procedures for an installation.

1

2

3

(3 marks)

Total 11 marks

INTENTIONALLY BLANK

QUESTION 2

(a) State the minimum length of time that a trainee gasfitter must work under direct supervision of his or her supervisor.

_____

(1 mark) ☐

(b) State the minimum length of time that a gasfitter working with an exemption under supervision must work under the direct supervision of his or her supervisor.

_____

(1 mark) ☐

(c) Name TWO licensing categories other than trainees and exemption holders under which workers must be supervised and have their work verified by a certifying gasfitter.

1 _____

2 _____

(2 marks) ☐

(d) Describe what is meant by the term nominated person in relation to gasfitting.

_____

(2 marks) ☐

Total 6 marks ☐

QUESTION 3

The diagram on the opposite page shows the plan of three units in a domestic dwelling.

The plan is drawn at a scale of 1:100

Using the sizing tables from AS/NZS 5601 Part 1, pipe size the gas installations for units 1 and 3.

The installation specifications include the following.
- Pipe material: Copper NZS 3501
- Installation pressure: 1.7 kPa
- Gas type: Natural gas

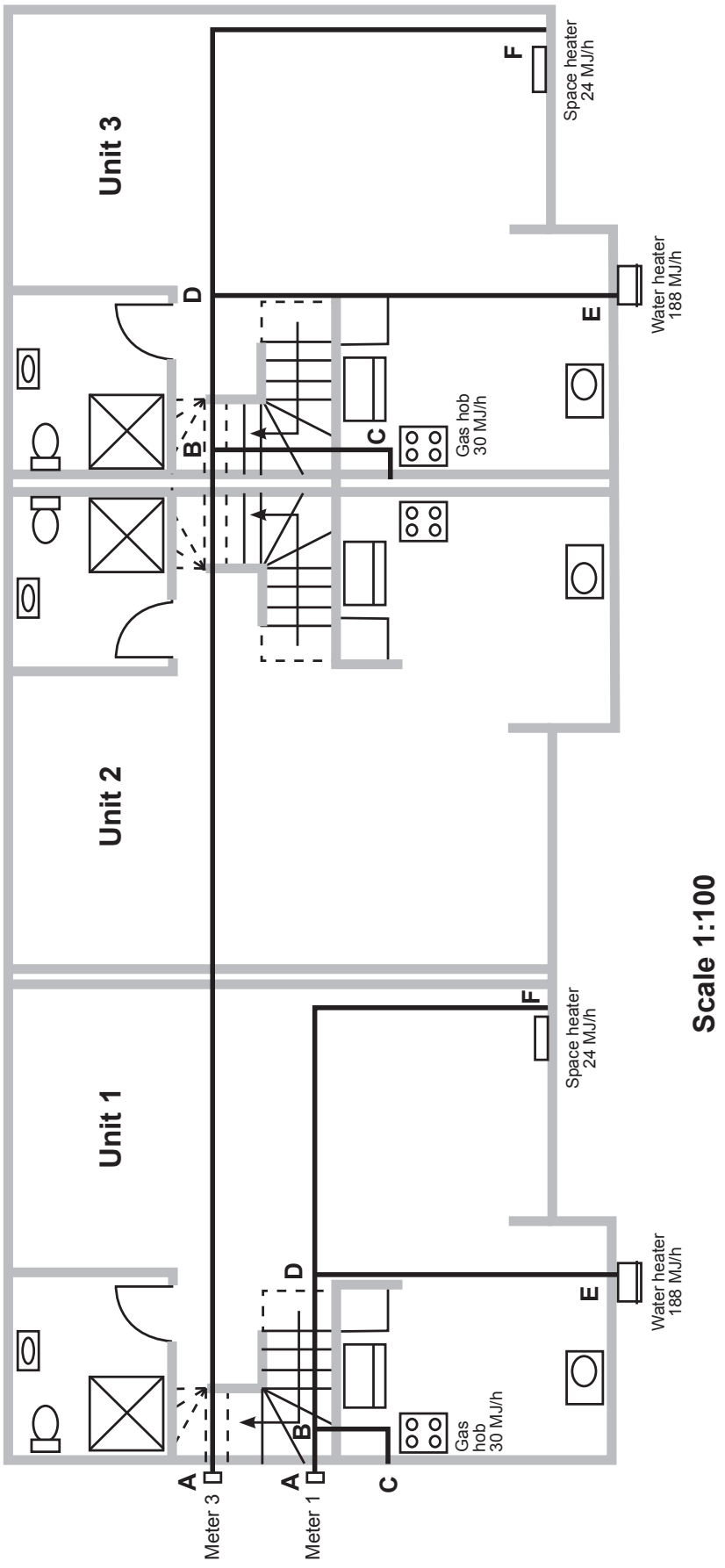
Allow 2 m for all the droppers to the water heaters, space heaters, gas hobs and gas meters.

Unit 1			
Pipe Section	Section Length (m)	MJ/h	Diameter (mm)
A – B			
B – C			
B – D			
D – E			
D – F			

Unit 3			
Pipe Section	Section Length (m)	MJ/h	Diameter (mm)
A – B			
B – C			
B – D			
D – E			
D – F			

Total 15 marks

QUESTION 3 (cont'd)



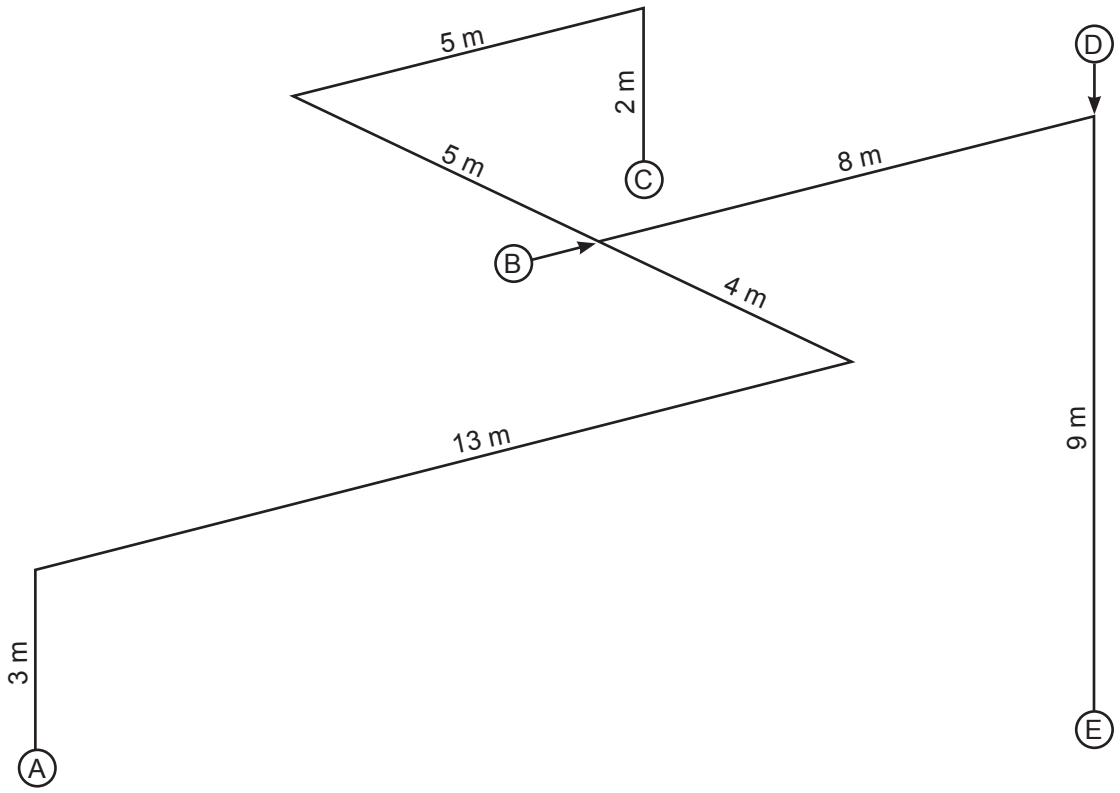
INTENTIONALLY BLANK

QUESTION 4

(a) The diagram below is a schematic of existing gas copper pipework (NZS 3501) in a building.

- Section A–B is 50 mm
- Section B–C is 25 mm
- Section B–D is 40 mm
- Section D–E is 32 mm

Find, in litres, the approximate volume of the pipework.



(4 marks)

(b) State the maximum acceptable pressure drop permitted, according to AS/NZS 5601 Part 1, when a leakage test of the installation in (a) is being undertaken.

_____

(1 mark)

Total 5 marks

INTENTIONALLY BLANK

QUESTION 5

(a) On a construction worksite, it is noticed that a work colleague has collapsed and is lying on the ground. The colleague is unresponsive.

Give the first action that must be taken.

_____

(1 mark) ☐

(b) Give THREE other actions that should be taken in this situation.

1 _____

2 _____

3 _____

(3 marks) ☐

Total 4 marks ☐

INTENTIONALLY BLANK

QUESTION 6

(a) An 8 MJ/h flueless space heater is to be installed in a hallway having a ceiling height of 2.7 m.

Calculate the minimum required floor area of the hallway.

(3 marks)

(b) A room measures 6.1 m × 3.3 m and has a ceiling height of 2.85 m.

The heat input per cubic metre of room volume is to be 0.38 MJ/h.

Calculate in kW the heat input required for the room.

(3 marks)

Total 6 marks

INTENTIONALLY BLANK

QUESTION 7

A notifiable incident is an unplanned or uncontrolled incident in the workplace that seriously exposes, endangers or threatens the health and safety of workers or others to a serious risk.

(a) Give FOUR occurrences that would be classed as notifiable incidents.

1 _____

2 _____

3 _____

4 _____

(4 marks)

(b) Give TWO actions that must be taken immediately after a notifiable incident has occurred.

1 _____

2 _____

(2 marks)

(c) A notifiable incident is classed as a notifiable event.

Give TWO other occurrences that are classed as notifiable events.

1 _____

2 _____

(2 marks)

Total 8 marks

INTENTIONALLY BLANK

QUESTION 8

(a) Give TWO requirements that must be met when an underground service is being installed and it will cross over another underground service.

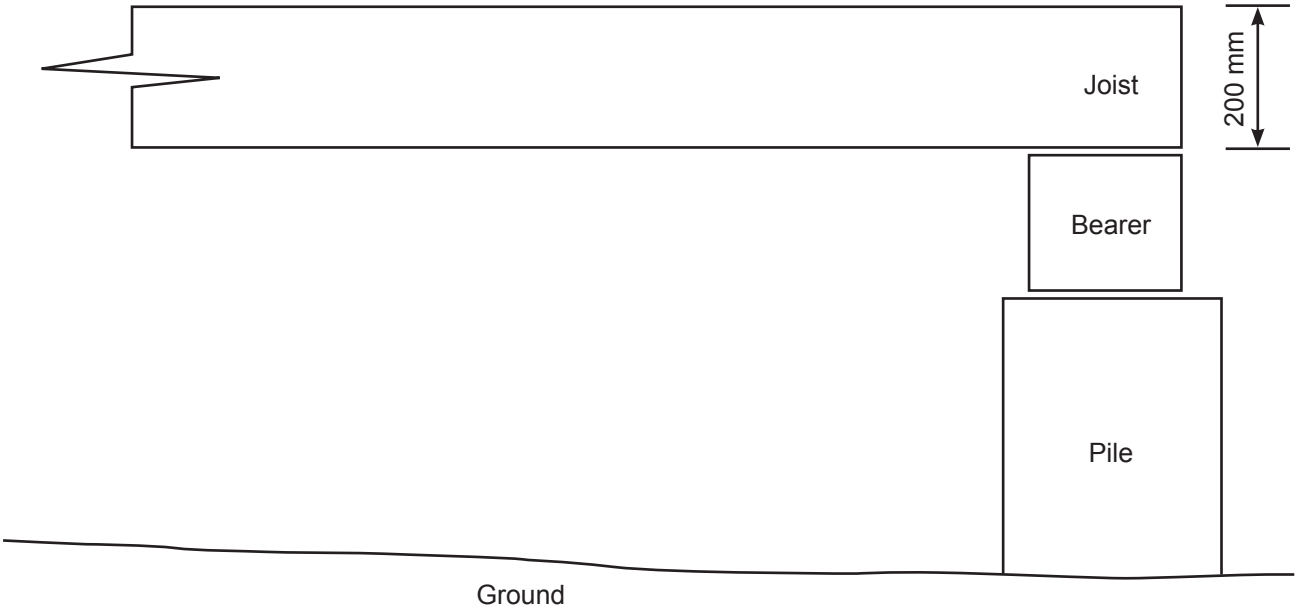
1 _____

2 _____

(2 marks)

(b) The diagram below shows part of the timber structure of a building.

On the drawing, show where holes are permitted to be drilled in the joist to accommodate pipework. Include the maximum size hole permitted to be drilled in the joist.



(3 marks)

Total 5 marks

INTENTIONALLY BLANK

QUESTION 9

An LPG cylinder is to be installed inside a building to supply a cooktop.

Give FOUR requirements that must be met with regard to the installation for it to comply with AS/NZS 5601 Part 1.

1 _____

2 _____

3 _____

4 _____

Total 4 marks

QUESTION 10

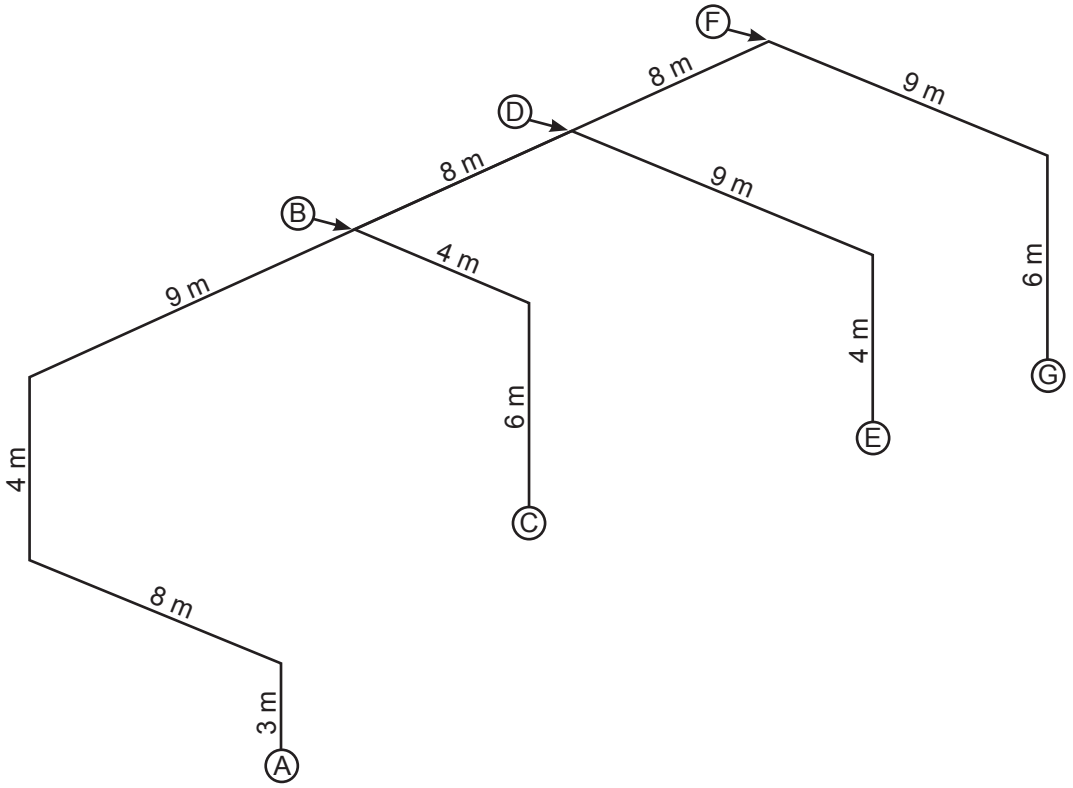
(a) The diagram below shows a plan of copper pipework to be installed in a commercial building.

Munson rings with wall brackets using rod hangers are to be used to support the pipework.

The building specifications state the following.

- Support is to be provided 100 mm from the end of each pipe.
- Three clips are to be included for each tee, each located 100 mm from the tee.
- Two clips are to be included for each bend, each located 100 mm from the bend.

The clips are to be installed to comply with the minimum requirements of AS/NZS 5601 Part 1.



Complete the following table to give the number of clips and the rod hanger sizes required for the pipework.

Pipe Section	Number of clips	Rod hanger size
A – B 150 mm diameter pipe		
B – C 50 mm diameter pipe		
B – D 65 mm diameter pipe		
D – E 40 mm diameter pipe		
D – F 32 mm diameter pipe		
F – G 25 mm diameter pipe		

(9 marks)

QUESTION 10 (cont'd)

(b) List THREE types of movement that should be allowed for when designing support for gas pipework across a workshop roof space.

1 _____

2 _____

3 _____

(3 marks)

Total 12 marks

INTENTIONALLY BLANK

QUESTION 11

(a) When performing a safety verification of an existing gas installation to NZS 5255, the standard states that the inspection must be supplemented by appropriate tests.

List TWO tests that this may include.

1 _____

2 _____

(2 marks)

(b) List TWO evaluation methods that may be used to provide evidence of compliance when a safety verification of an existing installation is being undertaken.

1 _____

2 _____

(2 marks)

(c) Complete the table below by giving the correct risk category for each situation, as defined in the Gas (Safety and Measurement) Regulations.

Situation	Category
Replacing a gas valve on an oven in a restaurant.	
Replacing a gas hob by another one of the same model.	
Adding a gas space heater to an existing installation in a house.	
Installing a gas water heater in a single-storied house under construction.	

(4 marks)

Total 8 marks

INTENTIONALLY BLANK

QUESTION 12

(a) Name a gas appliance type that is not permitted to be connected to a common flue that serves any other type of appliance.

_____

(1 mark)

(b) When designing common flues for appliances at different levels, give TWO reasons why a gasfitter may choose to use a separate flue for an appliance on the top floor rather than connect it to the common flue.

1 _____

2 _____

(2 marks)

(c) A flue connector is to be attached to a common flue. The tables from AS/NZS 5601 Part 1 allow for two 90° changes of direction.

Give THREE design alterations that allow additional changes of direction.

1 _____

2 _____

3 _____

(3 marks)

Total 6 marks

SECTION B

Answer the following multiple-choice questions by writing your answer (A, B, C, D or E) in the box provided after each one of the questions.

Each correct answer in this section of the examination is worth 1 mark.

Should your choice of answer be unclear no mark will be awarded.

1. According to AS/NZS 5601 Part 1, what is the minimum clearance permitted between an open flue terminal and another flue terminal?

   A. 200 mm.

   B. 300 mm.

   C. 500 mm.

   D. 600 mm.

   E. 1000 mm.

   ☐

2. According to AS/NZS 5601 Part 2, what is the maximum distance that a pipe support can be from an elbow?

   A. 25 mm.

   B. 50 mm.

   C. 100 mm.

   D. 150 mm.

   E. 250 mm.

   ☐

3. Which of the following New Zealand Building Code clauses provides an acceptable solution for designing and installing soaker flashings?

   A. B2

   B. E1

   C. E2

   D. G1

   E. G12

   ☐

4. LPG cylinders need to be restrained against seismic activity if they are larger than what capacity?

   A. 9 litres.

   B. 15 litres.

   C. 18 litres.

   D. 20 litres.

   E. 25 litres.

   ☐

5. According to AS/NZS 5601 Part 2, what is the minimum possible permitted free area of the total permanent ventilation for any space in a caravan that contains a gas appliance?

   A. 1000 mm^2.

   B. 2000 mm^2.

   C. 3000 mm^2.

   D. 4000 mm^2.

   E. 5000 mm^2.

   ☐

6. According to AS/NZS 5601 Part 2, what pressure should installation pipework in a caravan be pressurised to when a pipework test is being performed?

   A. 2.0 kPa.

   B. 2.75 kPa.

   C. 5.0 kPa.

   D. 7.0 kPa.

   E. 14.0 kPa.

   ☐

7. According to AS/NZS 5601 Part 1, if the maximum over-pressure is not indicated on an individual component used in a gas installation and the rated working pressure is known to be 2 kPa, which of the following would be used as the maximum over-pressure for the installation?

   A. 2 kPa.

   B. 2.5 kPa.

   C. 3 kPa.

   D. 7 kPa.

   E. 14 kPa.

   ☐

8. What is the minimum allowable diameter of a drain fitted in the base of an LPG cylinder compartment on a boat?

A. 10 mm.

B. 15 mm.

C. 19 mm.

D. 20 mm.

E. 25 mm.

☐

9. A 40 MJ storage water heater with a natural draught flue is to be installed in a cupboard.

The cupboard will be ventilated using mechanical means.

According to AS/NZS 5601 Part 1, what is the minimum rate at which the fan will need to supply air at low level?

A. 20 litres/second

B. 40 litres/second

C. 50 litres/second

D. 100 litres/second

E. 150 litres/second

☐

10. According to AS/NZS 5601 Part 2, where low-level ventilation is required in a caravan, what is the maximum allowable distance between the ventilation provided and the floor?

A. 25 mm.

B. 50 mm.

C. 100 mm.

D. 150 mm.

E. 200 mm.

☐

Total 10 marks ☐

This page is available for additional working or answers

Question number _____

This page is available for additional working or answers

Question number _____

This page is available for additional working or answers

Question number _____

This page is available for additional working or answers

Question number _____

For Examiner's use only

Question number	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
Section B		
Total		