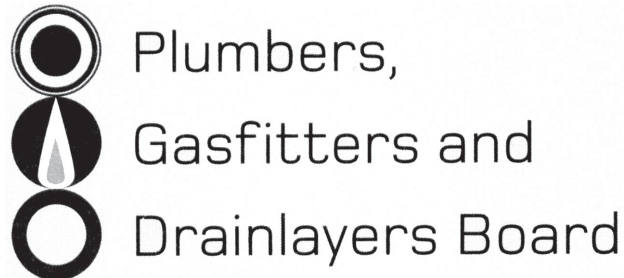


Affix label with Candidate Code  
Number here.  
If no label, enter candidate  
Number if known

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No. 9196



## REGISTRATION EXAMINATION, NOVEMBER 2014

# 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.

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 16–17 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.

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 17 pages in the correct order and that none of these pages is blank.

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

Candidates that sat this examination in November 2014 were provided with the following document:

- AS/NZS 5601.2010 Part 1: General installations

## 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 =  $0.7854 \times D^2 \times H$

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

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

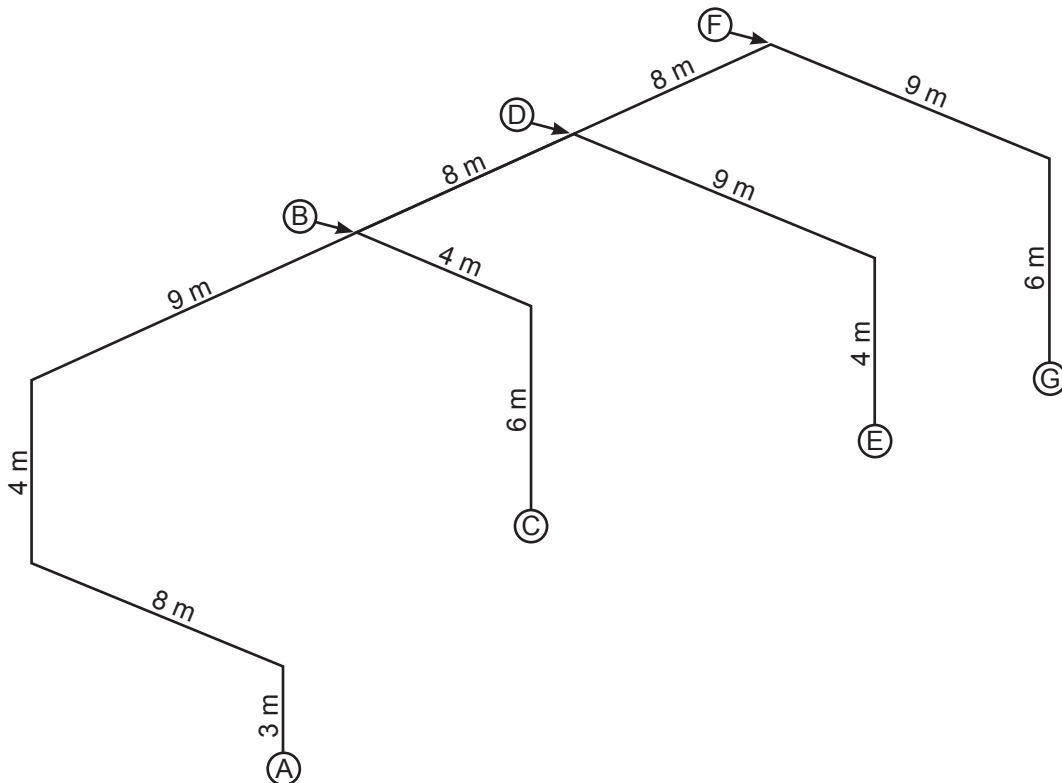
Gas rate (m<sup>3</sup>) =  $\frac{\text{volume (m}^3\text{)} \times 3600}{\text{time (seconds)}}$

## SECTION A

### QUESTION 1

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.

- 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.



Complete the following table to show the number of clips and the rod hanger sizes required for the pipework. The clips are to be installed to comply with the minimum requirements of AS/NZS 5601 Part 1.

Pipe Section	Number of clips	Rod hanger size
A – B 100 mm diameter pipe		
B – C 65 mm diameter pipe		
B – D 40 mm diameter pipe		
D – E 25 mm diameter pipe		
D – F 32 mm diameter pipe		
F – G 20 mm diameter pipe		

Total 9 marks

## QUESTION 2

- (a) The diagram on the opposite page shows the plan of three units in a domestic dwelling. The plan is drawn to a scale of 1:100.

Using AS/NZS 5601 Part 1, pipe size the gas installation for the three units shown in the plan on the following page.

- Pipe material: Copper NZS 3501
- Installation pressure: 1.7 kPa
- Gas type: natural gas

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

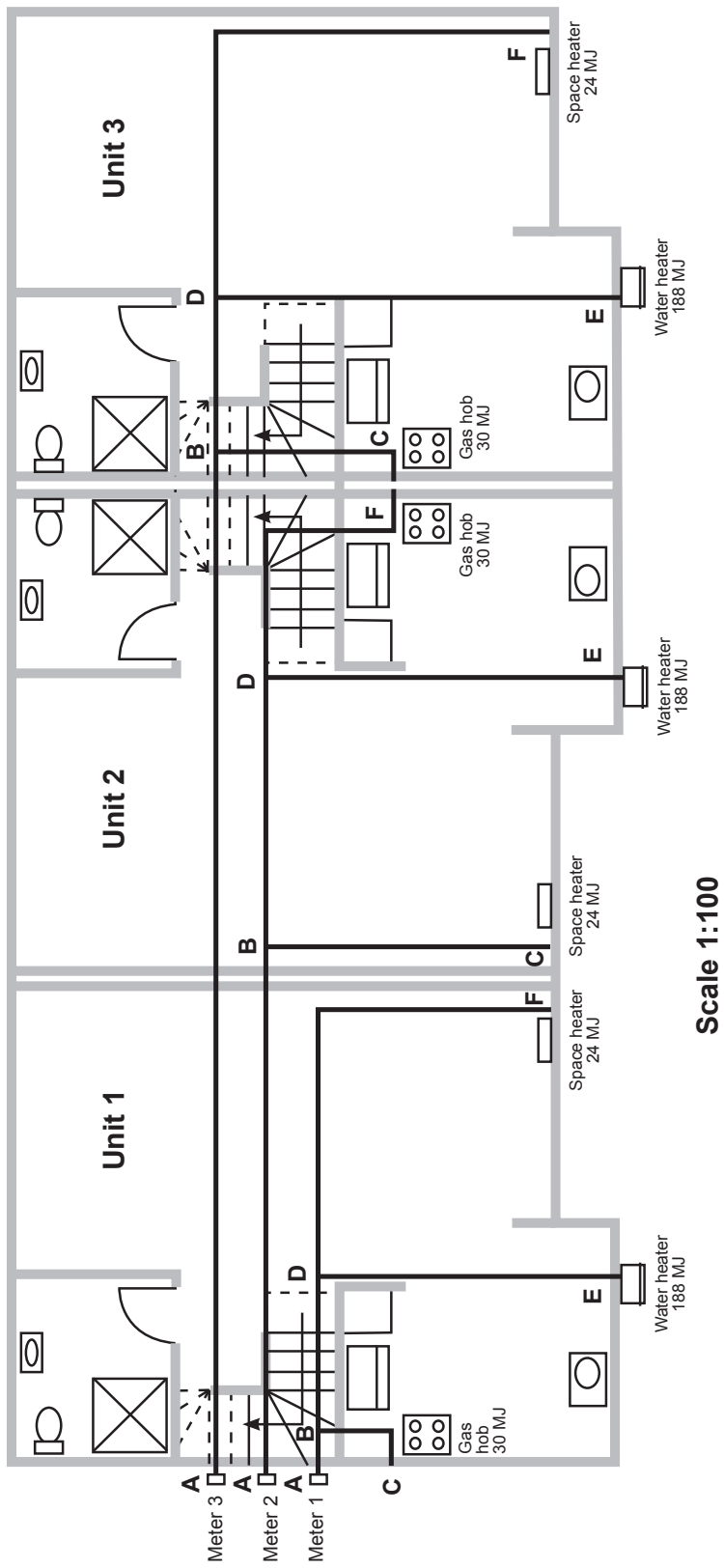
Unit 1		Length of longest run:	
Pipe Section	Section length	MJ	Diameter
A – B			
B – C			
B – D			
D – E			
D – F			

Unit 2		Length of longest run:	
Pipe Section	Section length	MJ	Diameter
A – B			
B – C			
B – D			
D – E			
D – F			

Unit 3		Length of longest run:	
Pipe Section	Section length	MJ	Diameter
A – B			
B – C			
B – D			
D – E			
D – F			

Total 24 marks

QUESTION 2 (cont'd)



### QUESTION 3

The Gas (Safety and Measurement) Regulations define the three categories of gasfitting work: low-risk, high-risk and general risk.

(a) (i) Give TWO examples of gasfitting that would be classed as low-risk.

- 1 \_\_\_\_\_  
2 \_\_\_\_\_

(2 marks)

(ii) Give TWO examples of gasfitting that would be classed as high-risk.

- 1 \_\_\_\_\_  
2 \_\_\_\_\_

(2 marks)

(iii) State what is classed as general-risk.

\_\_\_\_\_

(1 mark)

(b) The following situations relate to installations supplied by single 9 kg LPG cylinders.

Choose the correct risk category for each situation.

Situation	Risk Category
Replacing a gas hob by another one of the same model.	
Installing a new gas hob in a house.	
Adding a gas hob to an existing installation in a house.	
Installing a gas hob in a caravan with sleeping quarters.	

(4 marks)

**Total 9 marks**

#### QUESTION 4

List in order TEN steps in the operational sequence of a gas-fired electronic continuous flow water heater.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_
- 6 \_\_\_\_\_
- 7 \_\_\_\_\_
- 8 \_\_\_\_\_
- 9 \_\_\_\_\_
- 10 \_\_\_\_\_

Total 10 marks



## QUESTION 5

(a) Answer the following questions in accordance with AS/NZS 5601 Part 1.

(i) Give TWO permitted options for substituting components on a proprietary system.

1 \_\_\_\_\_

2 \_\_\_\_\_

(2 marks)

(ii) When a proprietary system is being installed, state how the product used is to be made identifiable for future alterations/additions.

\_\_\_\_\_  
\_\_\_\_\_

(2 marks)

(iii) State the TWO situations where identification markings are required on above-ground copper consumer piping installed in a multiple occupancy residential premises.

1 \_\_\_\_\_

2 \_\_\_\_\_

(2 marks)

(iv) Give the maximum spacing for identification markings in a straight section of pipework for the situation in (iii).

\_\_\_\_\_

(1 mark)

**QUESTION 5 (cont'd)**

(b) When consumer gas pipework is installed into high a rise building, a plan of the consumer piping must be displayed.

(i) State where the plan is to be displayed.

\_\_\_\_\_

(1 mark)

(ii) Give TWO requirements that the displayed plan must meet.

1 \_\_\_\_\_

2 \_\_\_\_\_

(1 mark)

**Total 9 marks**

**QUESTION 6**

Give the full name of the documents which relate to gasfitting shown below and state when each of them is to be issued.

(a) CoC

Name: \_\_\_\_\_

When Issued: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2 marks)

(b) GSC

Name: \_\_\_\_\_

When Issued: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(2 marks)

(c) CoV

Name: \_\_\_\_\_

When Issued: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

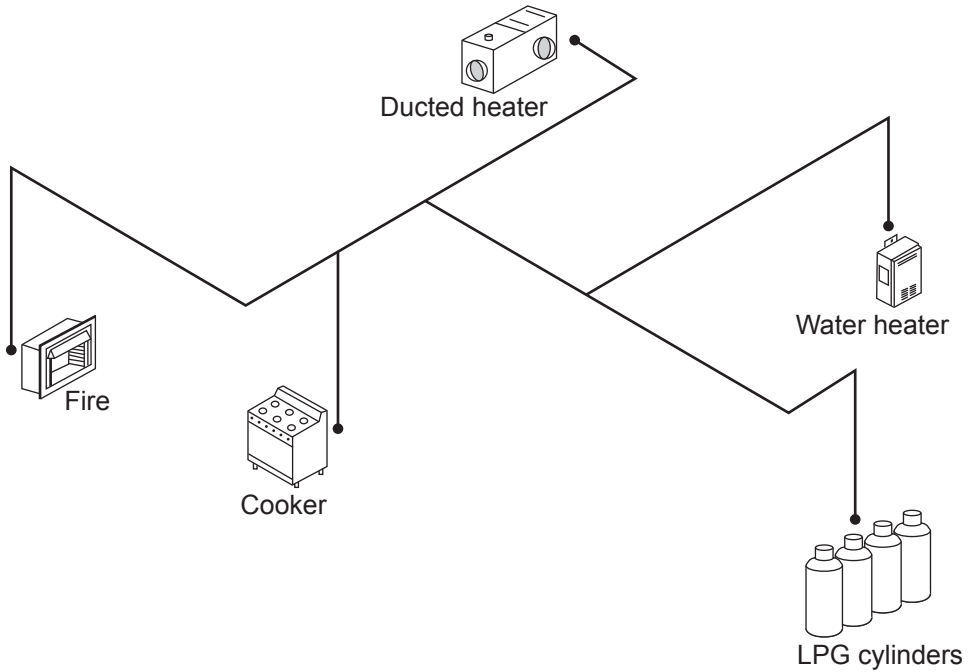
(2 marks)

**Total 6 marks**

**QUESTION 7**

(a) The diagram below shows the layout of a single residential gas installation.

On the diagram, show where pressure test points and isolating valves are required, in accordance with the minimum requirements of AS/NZS 5601 Part 1.



(3 marks)

(b) List FOUR requirements that must be met with regard to where the cylinder supplying an LPG cooktop is located inside a house, in accordance with AS/NZS 5601 Part 1.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_

(2 marks)

**Total 5 marks**

**QUESTION 8**

(a) Give THREE characteristics of a work site that determine that the site will be deemed to be a confined space.

1 \_\_\_\_\_  
\_\_\_\_\_

2 \_\_\_\_\_  
\_\_\_\_\_

3 \_\_\_\_\_  
\_\_\_\_\_

**Total 3 marks**

### QUESTION 9

A builder doing renovation work has requested that a metal pipe, which the builder believes to be a copper gas pipe, be repositioned.

Give FIVE actions to be carried out before the pipe is cut.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

**Total 5 marks**

**QUESTION 10**

Give THREE safety aspects that should be checked before using a cherry picker to access a high point on the exterior of a building.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_

**Total 3 marks**

**QUESTION 11**

Name THREE types or methods of fire-proofing a pipe penetration through a fire-cell wall.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_

**Total 3 marks**

**QUESTION 12**

Give FOUR factors that need to be considered when designing a flue system for a gas appliance.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_

**Total 4 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.

Note that should your choice of answer be unclear no mark will be awarded for that question.

1. According to AS/NZS 5601 Part 1, what length of piping is to be exceeded before the installation of reversion fittings is required on proprietary multilayer systems installed in detached dwellings?

- A 5 m
- B 7 m
- C 10 m
- D 15 m
- E 20 m

2. What is the minimum length of time that an exempted person under supervision must work in the presence of the supervisor, or a licensed person who is also working under the same supervisor?

- A 6 months
- B 12 months
- C 18 months
- D 24 months
- E 36 months

3. What is the minimum length of time that a limited certified trainee must work in the presence of the supervisor, or a licensed person who is also working under the same supervisor?

- A 6 months
- B 12 months
- C 18 months
- D 24 months
- E 36 months



4. According to AS/NZS 5601 Part 1, what should the minimum height of a natural draught flue be if it is not specified in the manufacturer's instructions?
- A 0.6 m
  - B 1.2 m
  - C 1.8 m
  - D 2.4 m
  - E 3.0 m
- 

5. According to AS/NZS 5601 Part 1, what is the largest volume a manometer (water gauge) can be used to test?
- A 0.3 m<sup>3</sup>
  - B 0.6 m<sup>3</sup>
  - C 3.0 m<sup>3</sup>
  - D 10 m<sup>3</sup>
  - E 30 m<sup>3</sup>
- 

6. Which of the following statements best describes Meter Factor?
- A An allowance which is factored into a gas volume to adjust for the calorific value of the gas.
  - B A factor of inaccuracy which is common in domestic gas meters.
  - C As gas passes through the meter energy is lost operating the dials.
  - D The allowance for a gas taking up less volume while under pressure.
  - E The factor caused by the pressure loss across the gas meter.
- 

7. Which of the following pressures is equivalent to six inches water gauge?
- A 0.6 kPa
  - B 1.2 kPa
  - C 1.5 kPa
  - D 3.0 kPa
  - E 6.0 kPa
-

8. 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

9. According to AS/NZS 5601 Part 1, which of the following specifies the minimum permitted gradient on a lateral run of flue?

- A 10 mm per m
- B 12 mm per m
- C 20 mm per m
- D 24 mm per m
- E 28 mm per m

10. A 30 MJ internal gas storage water heater is to be installed in a room using only adventitious ventilation.

According to AS/NZS 5601 Part 1, what is the minimum volume the room can have?

- A 10 m<sup>3</sup>
- B 12 m<sup>3</sup>
- C 18 m<sup>3</sup>
- D 24 m<sup>3</sup>
- E 30 m<sup>3</sup>

**Total 10 marks**

For Examiner's use only

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