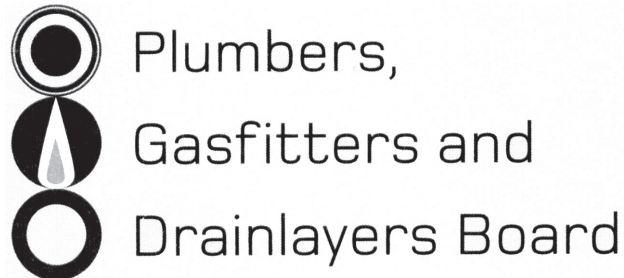


Affix label with Candidate Code  
Number here.  
If no label, enter candidate  
Number if known

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No. 9196



## REGISTRATION EXAMINATION, JUNE 2018

# 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 17-21 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 21 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 June 2018 were provided with the following documents:

- AS/NZS 5601 Part 1: General installations
- AS/NZS 5601 Part 2: LP Gas installations in caravans and boats for non-propulsive purposes
- LPG Association Code of Practice No2: Installation and maintenance of twin 45kg LPG cylinder systems

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

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

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

## SECTION A

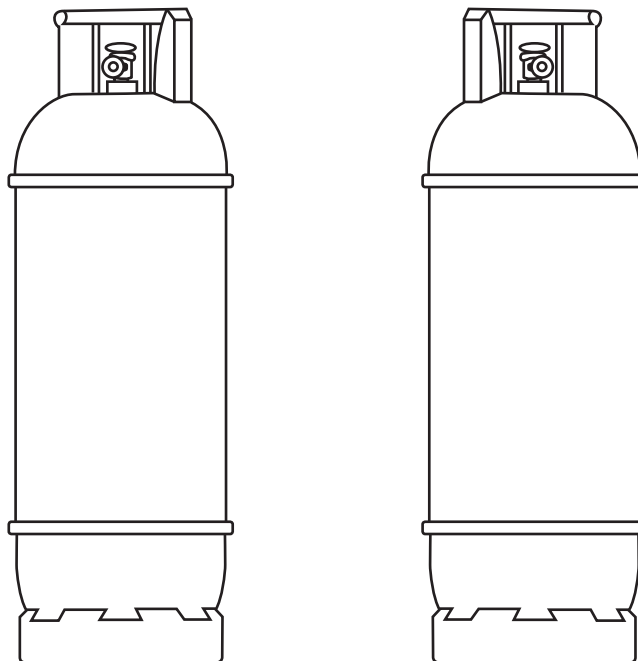
### QUESTION 1

The starter drawing below shows two 45 kg LPG cylinders.

Complete the drawing to show an LPG auto changeover two stage regulator station to suit the cylinders.

Label all main components of the flexible cylinder connections, including an auto changeover first stage regulator with separate second stage regulator. Do not include clearances.

The installation is to follow the guidelines of the LPGA Code of Practice.



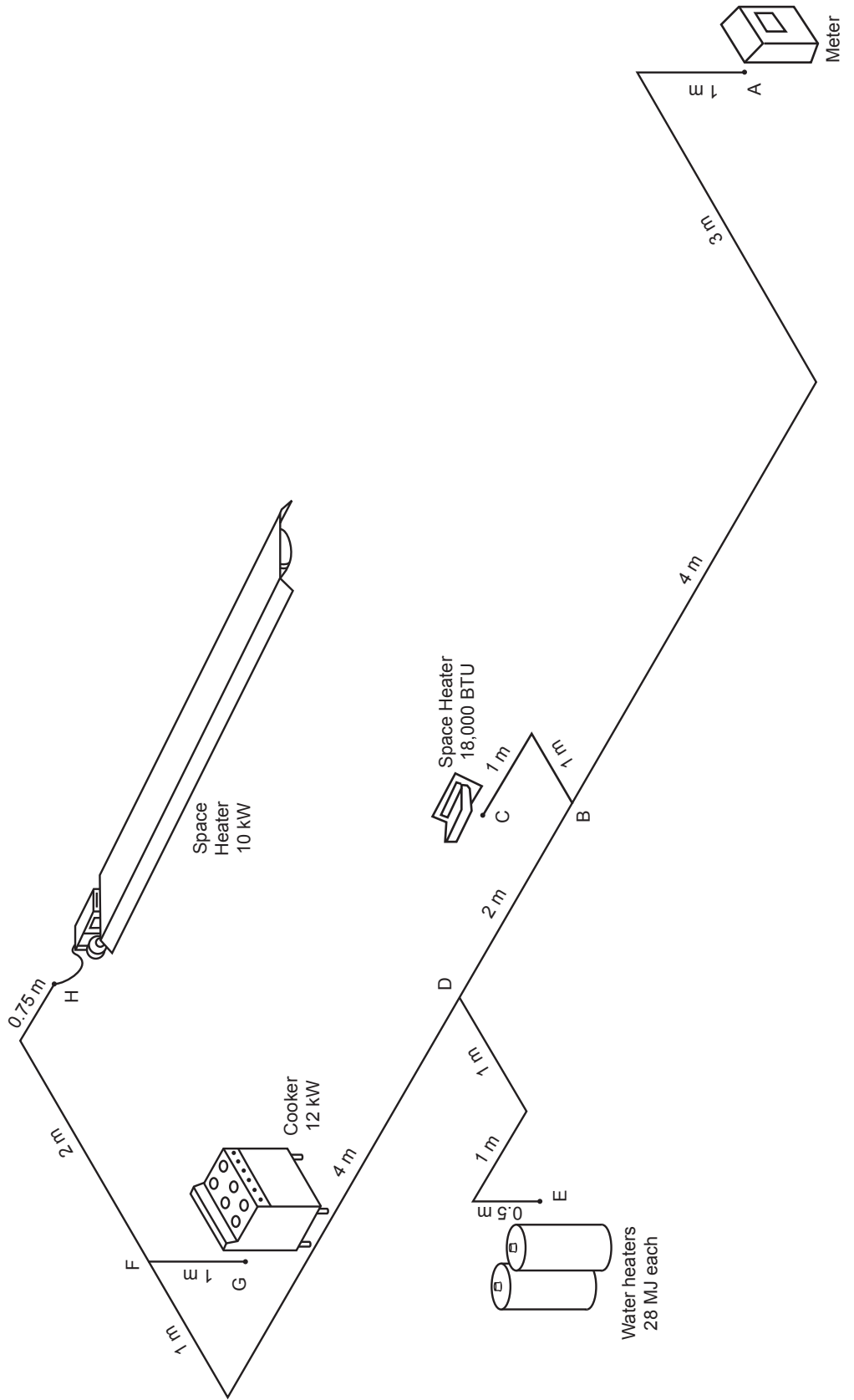
Total 7 marks

## QUESTION 2

The diagram below shows the pipework and appliances for a gas installation.

Installation details are as follows:

- Natural gas
- Copper pipe (NZS 3501)
- The installation supply pressure is 2.0 kPa.



**QUESTION 2 (cont'd)**

Use AS/NZS 5601 Part 1 Appendix F to complete the tables below to pipe size the installation. You may use either the sizing tables or the sizing graphs to answer this question.

Longest run (m)	
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Pipe Section	Length (m)	Gas flow (MJ/h)	Nominal size (mm)
A – B			
B – C			
B – D			
D – E			
D – F			
F – G			
F – H			

Total 15 marks

### QUESTION 3

- (a) NZS 5255 states that when a safety verification of an existing gas installation is being performed to NZS 5255, the inspection must be supplemented by appropriate tests.

List TWO of these tests.

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

(2 marks)

- (b) State the full name of a CoV.

\_\_\_\_\_

(1 mark)

- (c) 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)

**QUESTION 3 (cont'd)**

- (d) (i) Complete the table below by giving the category of gasfitting work, as defined in the Gas (Safety and Measurement) Regulations, for each situation.

Situation	Category
A new gas installation in a one-storey building is being completed.	
A hob is being fitted in a caravan.	
A gas appliance is being serviced.	
A gas heater is being added to an existing installation.	

(4 marks)

- (ii) Name the category of gasfitting work that requires details of the installation to be entered into an online database.

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(1 mark)

- (iii) Name the government agency that manages the online database in (ii).

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(1 mark)

**Total 11 marks**



**QUESTION 4**

- (a) 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 \_\_\_\_\_

(5 marks)

- (b) A natural gas appliance is to be converted to operate on LPG.

List SIX items that must be checked and that may need changing in the conversion.

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

(6 marks)

- (c) An installation is being converted from LPG to natural gas.

Give TWO aspects of the **installation pipework** that must be checked and that may need changing.

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

(2 marks)

**Total 13 marks**

**QUESTION 5**

(a) Give the TWO options for replacing a damaged component on a proprietary system of gas pipework in a building.

1 \_\_\_\_\_

2 \_\_\_\_\_

(2 marks)

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

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

(2 marks)

**Total 4 marks**

**QUESTION 6**

(a) State the specific compliance document that should be used for the installation of commercial catering equipment in a catering vehicle.

\_\_\_\_\_

(1 mark)

(b) Describe the TWO situations where commercial catering equipment may be installed on a combustible surface without requiring fire resistant material.

1 \_\_\_\_\_

2 \_\_\_\_\_

(2 marks)

(c) Give the minimum clearance from grease filters for each of the commercial cooking appliances below.

(i) Deep fryer

\_\_\_\_\_

(1 mark)

(ii) Griddle

\_\_\_\_\_

(1 mark)

(d) State the maximum number of commercial cooking appliances that are permitted to be connected together to form a combination cooking range.

\_\_\_\_\_

(1 mark)

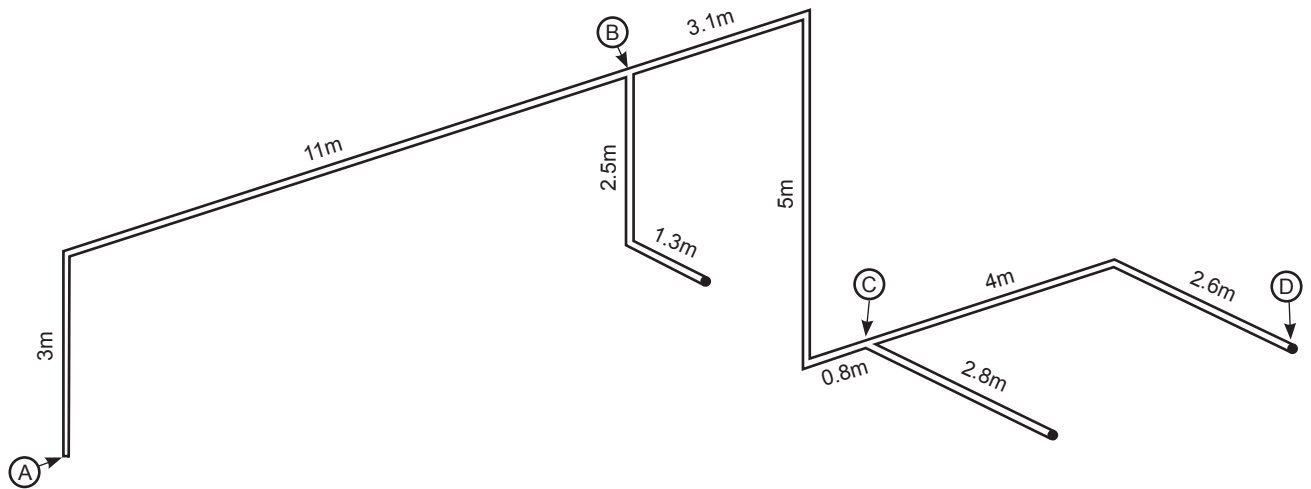
**Total 6 marks**

**QUESTION 7**

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

Calculate, in litres, the volume of the pipework.

- The pipe between points A and B is 40 mm.
- The pipe between points B and C is 32 mm.
- The pipe between points C and D is 25 mm.
- All other pipework is 20 mm.




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(5 marks)

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

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(1 mark)

**Total 6 marks**

## QUESTION 8

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

(a) Give THREE different possible reasons for this.

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

(3 marks)

(b) Give the first action that should be taken in this situation.

\_\_\_\_\_

(1 mark)

(c) Name TWO items of workplace safety documentation that may need to be completed in this situation.

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

(2 marks)

(d) The work colleague requires hospitalisation for immediate medical attention.

Name the government agency must be notified of this occurrence.

\_\_\_\_\_

(1 mark)

**QUESTION 8 (cont'd)**

(e) Give FIVE items of information that are to be provided on a particular hazardous (notifiable work) form.

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

(5 marks)

**Total 12 marks**

**QUESTION 9**

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

The installation has an operating pressure of 5.0 kPa.

State the types of pressure tests required to be performed throughout the course of the work, giving the test pressure for each.

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(8 marks)

(b) The gas installation operating pressure for an existing installation is to be increased from 1.8 kPa to 3.5 kPa.

List the required checks or tests that should be carried out during the process of changing the pressure.

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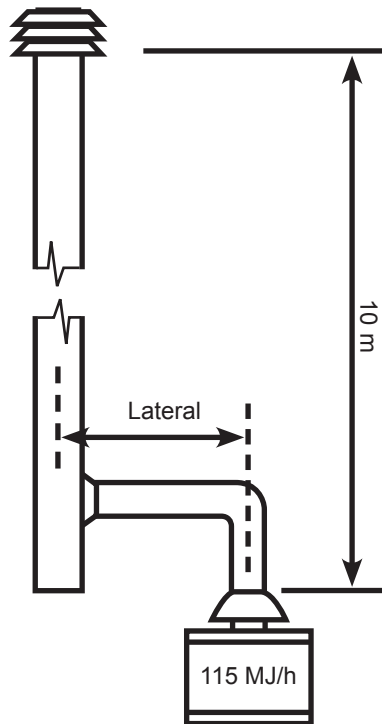
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(3 marks)

**Total 11 marks**

**QUESTION 10**

A flue for a gas fired space heater with a 100 mm draught diverter is to be installed, as shown in the diagram below.



Using the information from the diagram, complete the following tables by giving the minimum size of the flue for each situation according to AS/NZS 5601 Part 1.

(a) Flue located in a low heat loss environment.

	Situation A: Lateral length 0.6 m	Situation B: Lateral length 1.5 m
Minimum flue diameter		

(b) Flue located in a high heat loss environment.

	Situation A: Lateral length 0.6 m	Situation B: Lateral length 1.5 m
Minimum flue diameter		

**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.

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

1. A rectangular flue with the cross-sectional dimensions 75 mm × 200 mm is the equivalent of which circular flue diameter as specified in AS/NZS 5601 Part 1?

A 100 mm.

B 125 mm.

C 150 mm.

D 175 mm.

E 200 mm.

2. Gas installation pipework over what volume is defined as 'large'?

A 18 litres.

B 20 litres.

C 24 litres.

D 30 litres.

E 32 litres.

3. 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.

4. According to AS/NZS 5601 Part 2, what pressure should an installation in a caravan be pressurised to when testing for gas tightness?

- A 2.0 kPa.
- B 2.75 kPa.
- C 5.0 kPa.
- D 7.0 kPa.
- E 14.0 kPa.

5. 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

6. What two parties should be notified in the event that an unsafe gas installation is found?

- A The gas supplier and the owner/occupier.
- B The owner/occupier and Energy Safety.
- C The local territorial authority and the owner/occupier.
- D The owner/occupier and the Plumbers, Gasfitters and Drainlayers Board.
- E The Plumbers, Gasfitters and Drainlayers Board and Energy Safety.

7. According to AS/NZS 5601 Part 1, what is the nominal vaporisation capacity of a 45 kg LPG cylinder at 10°C?

- A 90 MJ/h.
- B 108 MJ/h.
- C 122 MJ/h.
- D 164 MJ/h.
- E 240 MJ/h.

8. What is the minimum length of time that an exempted person under supervision must work in the presence of the supervisor or a nominated person?
- A 6 months.
  - B 12 months.
  - C 18 months.
  - D 24 months.
  - E 36 months.

9. 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>.

10. Which of the following describes where consumer gas piping is not permitted to be installed?
- A Attached to a wooden fence.
  - B On the underside of a wooden deck.
  - C Across a roof.
  - D Under a paved area.
  - E Exposed to coastal conditions.

11. Hose assemblies for gas appliances must not exceed which length?
- A 1.2 m.
  - B 1.8 m.
  - C 2.0 m.
  - D 2.5 m.
  - E 3.0 m.

**Total 11 marks**

For Examiner's use only

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