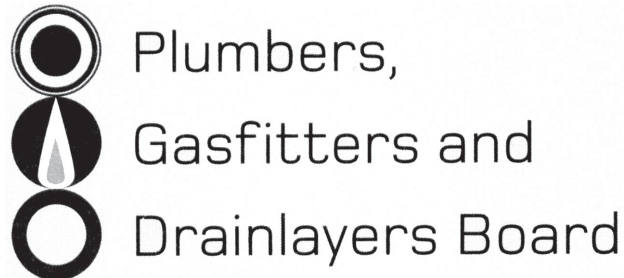


Affix label with Candidate Code
Number here.
If no label, enter candidate
Number if known

.....

No. 9196



REGISTRATION EXAMINATION, NOVEMBER 2015

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 18–21 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 November 2015 were provided with the following documents:

- AS/NZS 5601.2013 Part 1: General installations
- AS/NZS 5601.2013 Part 2: LP Gas installations in caravans and boats for non-propulsive purposes
- Gas (Safety and Measurements) Regulations 2010

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 (m³/h) = $\frac{\text{volume (m}^3\text{)} \times 3600}{\text{time (seconds)}}$

SECTION A

QUESTION 1

Complete the table below by calculating the daily consumption of gas in m³ required to supply the energy input for each appliance listed.

Heating value of natural gas = 40 MJ/m³

Heating value of LPG = 90 MJ/m³

Appliance	Daily Operating Time	Daily consumption (m ³)
LPG package burner 280 MJ/h	12 hours	
LPG space heater 38 000 BTU/h	6 hours	
Natural gas furnace 38 kW/h	7 hours	
Natural gas deep fryer 80 MJ/h	4 hours	

Total 6 marks

QUESTION 2

(a) A gas-fired storage water heater is not in operation.

Give THREE indicators that the flue has a blockage.

1 _____

2 _____

3 _____

(3 marks)

(b) Give TWO indications that the flue in (a) is blocked while the appliance is in operation.

1 _____

2 _____

(2 marks)

Total 5 marks

QUESTION 3

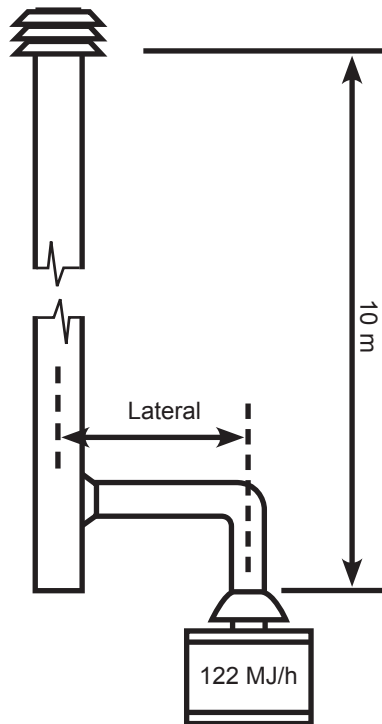
State FIVE factors that may impact on the overall efficiency of a gas-fired storage hot water system.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

Total 5 marks

QUESTION 4

- (a) The diagram below shows a gas-fired space heater fitted with a flue and a 100 mm draught diverter.



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

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

	Situation A: Lateral length 0.5 m	Situation B: Lateral length 0.8 m
Minimum flue diameter		

- (ii) Flue located in a high heat loss environment.

	Situation A: Lateral length 0.5 m	Situation B: Lateral length 0.8 m
Minimum flue diameter		

(4 marks)

QUESTION 4 (cont'd)

(b) Answer the following questions according to AS/NZS 5601 Part 1.

- (i) Name a gas appliance type which is not to be connected to a common flue which serves any other type of appliance.

(1 mark)

- (ii) When designing a common flue, give THREE reasons why the flue connector rise would need to be increased by 300 mm.

1 _____

2 _____

3 _____

(3 marks)

- (iii) Give the most critical operating condition that needs to be considered when designing a common flue.

(2 marks)

Total 10 marks

QUESTION 5

The diagram on the opposite page shows the floor plan of a house. A gas system is to be installed into the house according to the following specifications.

- Pipe material: Copper NZS 3501
- Gas type: LPG
- Installation working pressure: 3 kPa
- The pipework is to be located in the ceiling.
- Allow 2 m for any droppers required.

- (a) Using the pipe sizing graphs from AS/NZS 5601 Part 1, complete the following tables to pipe size the installation.

Installation pressure drop/m	
Length of longest run	

Pipe Section	MJ	Section Length	Diameter
A – B			
B – C			
B – D			
D – E			
D – F			
F – G			
F – H			

(16 marks)

- (b) The cylinders supplying the installation in (a) are located in an enclosure separate from the house.

An underground copper pipe (NZS 3501) is used to carry the gas 25 metres from the enclosure to the inlet regulator at the house.

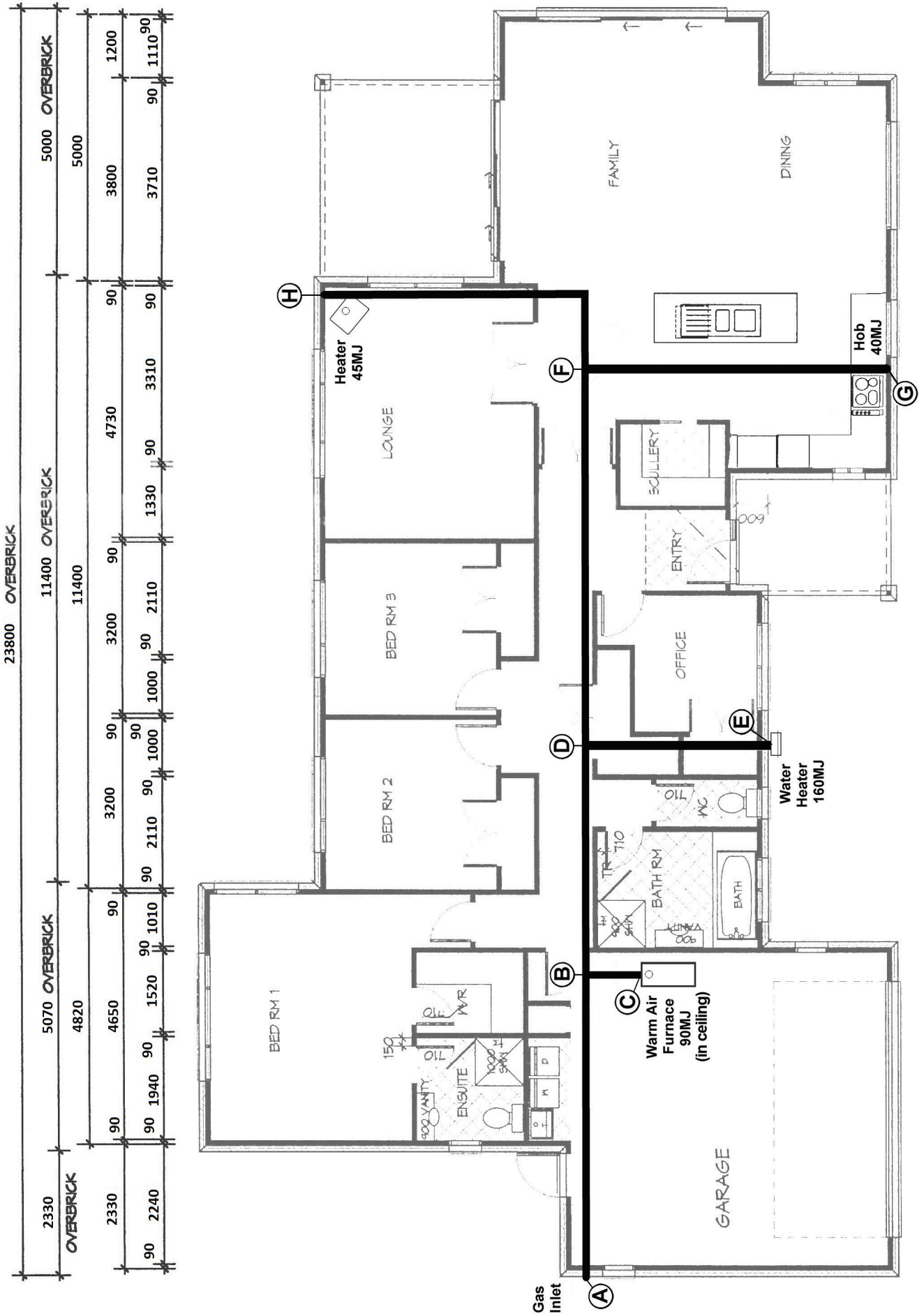
The pressure of the gas in the underground pipe will be 70 kPa. An allowable pressure drop of 10 kPa is suitable for this system.

Using the pipe sizing tables from AS/NZS 5601 Part 1, find the minimum diameter of the underground pipe.

(3 marks)

Total 19 marks

QUESTION 5 (cont'd)



QUESTION 6

- (a) AS/NZS 5601 Part 1 lists general commissioning procedures for use when manufacturers' commissioning instructions are not available.

List SIX additional procedures listed in AS/NZS 5601 Part 1 that must be followed when commissioning a domestic gas-fired freestanding cooker.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

(3 marks)

- (b) The operation of a range-hood is causing products of combustion to spill from an open-flued gas appliance.

Describe how a spillage test should be conducted.

(5 marks)

Total 8 marks

QUESTION 7

(a) A gas hob is being installed into a new kitchen. The wall behind the hob is timber-framed, and is lined with 10 mm thick plasterboard.

(i) State the minimum allowable distance between the hob and the unprotected plasterboard.

(1 mark)

(ii) Specify where on the gas hob the distance is measured from.

(1 mark)

(b) Give THREE methods of protecting the wall if the clearance is 100 mm.

1 _____

2 _____

3 _____

(3 marks)

(c) State the minimum height the wall protection must have if the clearance is 100 mm.

(1 mark)

Total 6 marks

QUESTION 8

A single occupancy sleeping compartment of a caravan has a 1.5 kW/h gas light.

Determine the minimum free area of the permanent ventilation required for the compartment in accordance with AS/NZS 5601 Part 2.

Total 4 marks

QUESTION 9

(a) List FOUR locations where pressure test points are required on an installation.

- 1 _____
- 2 _____
- 3 _____
- 4 _____

(2 marks)

(b) An installation with pressures exceeding 7 kPa is fitted with a pressure test point.

State the special feature that the pressure test point must have.

(1 mark)

Total 3 marks

QUESTION 10

(a) List FOUR items that should be included in a health and safety manual.

- 1 _____
- 2 _____
- 3 _____
- 4 _____

(2 marks)

(b) Give FIVE actions an employer must take following an incident that has resulted in serious harm.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____

(5 marks)

(c) List THREE formal documents a health and safety inspector may issue if safety concerns are found on a work site.

- 1 _____
- 2 _____
- 3 _____

(3 marks)

QUESTION 10 (cont'd)

(d) A trench is to be excavated between two buildings in a central city street.

List SIX factors about the site that need to be considered before excavation commences.

- 1 _____
- 2 _____
- 3 _____
- 4 _____
- 5 _____
- 6 _____

(6 marks)

Total 16 marks

QUESTION 11

Answer all parts of this question according to the Gas (Safety and Measurement) Regulations 2010.

- (a) Name the TWO parties that must be advised when a gasfitter finds an installation that presents immediate danger.

1 _____

2 _____

(2 marks)

- (b) State what information must be given to both of the parties in (a).

(2 marks)

- (c) The gasfitter is also required to advise one party to perform a task.

State this task.

(1 mark)

- (d) State TWO outcomes that must be achieved by following manufacturer's instructions.

1 _____

2 _____

(2 marks)

- (e) (i) State what must be verified before a gasfitter installs an appliance that requires a supplier declaration.

(1 mark)

- (ii) State where (i) can be verified.

(1 mark)

Total 9 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 gas installation has been connected to the gas supply and requires a gas safety certificate.

Within how many working days must the gas safety certificate be issued?

- A 5
- B 10
- C 15
- D 20
- E 25

2. 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.

3. A gas installation has been disconnected from the gas supply.

What is the minimum period of time after which a certificate of verification is required for reconnection?

- A 3 months.
- B 6 months.
- C 12 months.
- D 24 months.
- E 36 months.

4. According to the Gas (Safety and Measurement) Regulations 2010, what is the maximum amount an individual can be fined with if the individual falsely certifies gasfitting work?
- A \$500
 - B \$1,000
 - C \$2,000
 - D \$10,000
 - E \$30,000
-

5. 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.
-

6. Which of the following activities is not classed as notifiable work?
- A An excavation where the excavated face is steeper than 1 horizontal to 2 vertical.
 - B Working in an area classed as a confined space.
 - C A tunnel where workers work underground.
 - D Dismantling a scaffold from which a person could fall 5 m or more.
 - E An excavation which is more than 1.5 m deep and which is deeper than it is wide at the top.
-

7. When taking a flue gas analysis reading from a natural gas burner, what percentage of carbon dioxide is closest to perfect combustion?

- A 8%
- B 12%
- C 16%
- D 20%
- E 24%

9. According to AS/NZS 5601 Part 2, where high-level ventilation is required in a caravan and the ventilation is to be provided by an externally vented range hood, what is the maximum allowable distance between the range hood vent and the ceiling?

- A 25 mm.
- B 50 mm.
- C 150 mm.
- D 200 mm.
- E 400 mm.

9. 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 2.76 kPa
- C 5.0 kPa
- D 7.0 kPa
- E 14.0 kPa

Total 9 marks

For Examiner's use only

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