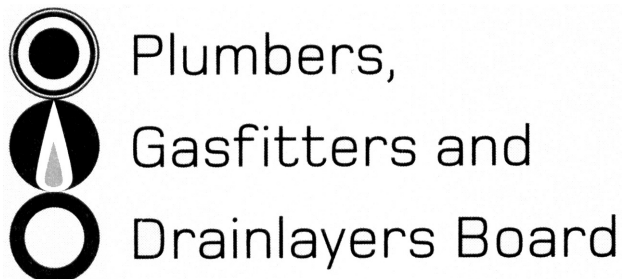


Affix label with Candidate Code
Number here.
If no label, enter candidate
Number if known

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No. 9196



REGISTRATION EXAMINATION, JUNE 2012

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 June 2012 were provided with the following documents:

- New Zealand Building Code clause E2 External Moisture
- Gas (Safety and Measurements) Regulations 2010
- NZS 5261 Gas Installation

SECTION A

QUESTION 1

Answer the following questions in relation to NZS 5261 Gas Installation.

- (a) List FOUR requirements that must be met when consumer gas pipe is to be installed in a ventilating duct.

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

(2 marks)

- (b) Give the TWO types of gas valves that are suitable for emergency shut off valves on a hot water boiler.

- 1 _____
- 2 _____

(1 mark)

- (c) List FOUR installation requirements that must be met by the valves in (b).

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

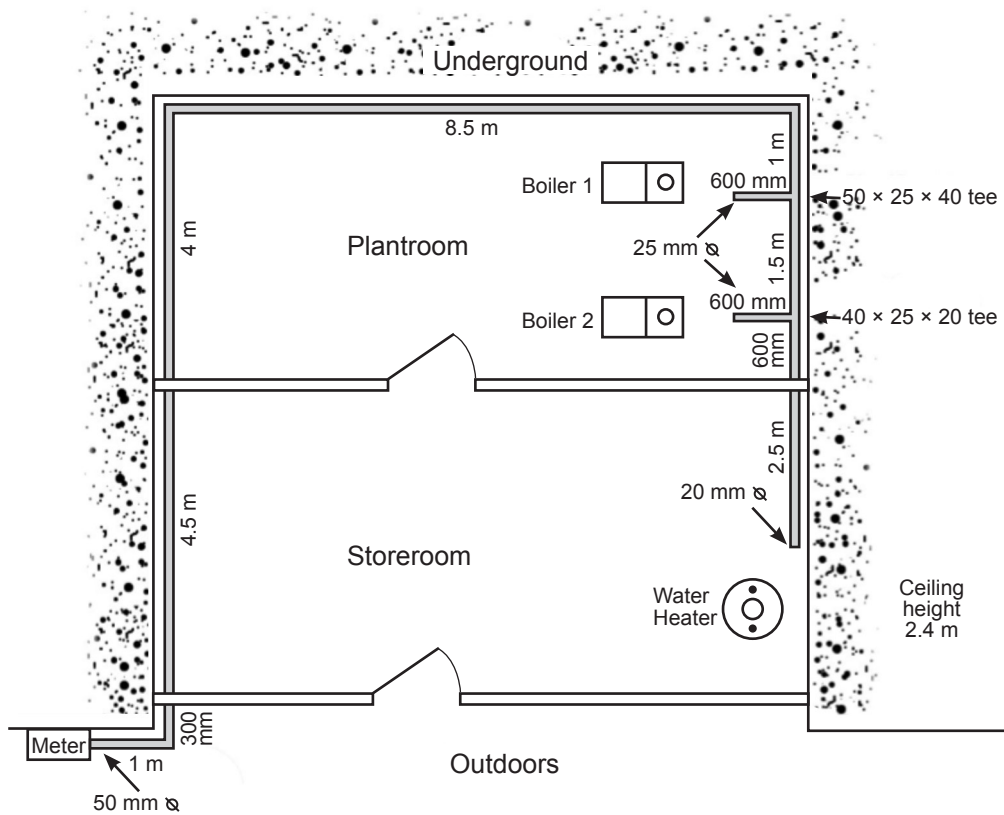
(2 marks)

Total 5 marks

QUESTION 2

(a) The diagram below shows a plan view of the basement of a commercial building. Clips are required for copper pipework that is to be installed in the basement.

- 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.
- A clip is to be placed on each side of any wall penetration 100 mm from the penetration.



Complete the following table to show the minimum of clips required for the pipework. The clips are to be installed to comply with NZS 5261 Gas Installation.

Size	Quantity	Size	Quantity
50 mm		25 mm	
40 mm		20 mm	

(4 marks)

QUESTION 2 (cont'd)

(b) The following gas appliances are to be installed as shown on the plan in (a).

- Boiler 1 180 MJ/h
- Boiler 2 180 MJ/h
- Water Heater 60 MJ/h

The ventilation is to be natural ventilation in accordance with the minimum requirements of NZS 5261 Gas Installation.

Specify the number, size and location of each vent required.

(6 marks)

(c) State where test points are required on a gas installation according to NZS 5261 Gas Installation.

(2 marks)

Total 12 marks

QUESTION 3

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

Heating value of natural gas = 40 MJ/m³

Heating value of LPG = 90 MJ/m³

Appliance	Daily Operating Time	Daily m ³ consumption
Natural gas, package burner 350 MJ/h	8 hours	
LPG, Cooker 140 MJ/h	3 hours	
Natural gas, furnace 120 MJ/h	5 hours	
LPG, Space heater 35 MJ/h	4 hours	

Total 4 marks

QUESTION 4

(a) Give FOUR reasons why an appliance would require combustion air to be ducted from outside.

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

(4 marks)

(b) A fault has developed on a gas oven. After the oven has been running for around 20 minutes it shuts the gas off and must be manually restarted.

Give THREE likely causes for the fault.

- 1 _____

- 2 _____

- 3 _____

(3 marks)

Total 7 marks

QUESTION 5

The plan on the opposite page shows a proposed natural gas installation for a new warehouse.

The wall mounted radiant heaters consume 24 MJ/h.

The suspended radiant tube heaters consume 72 MJ/h.

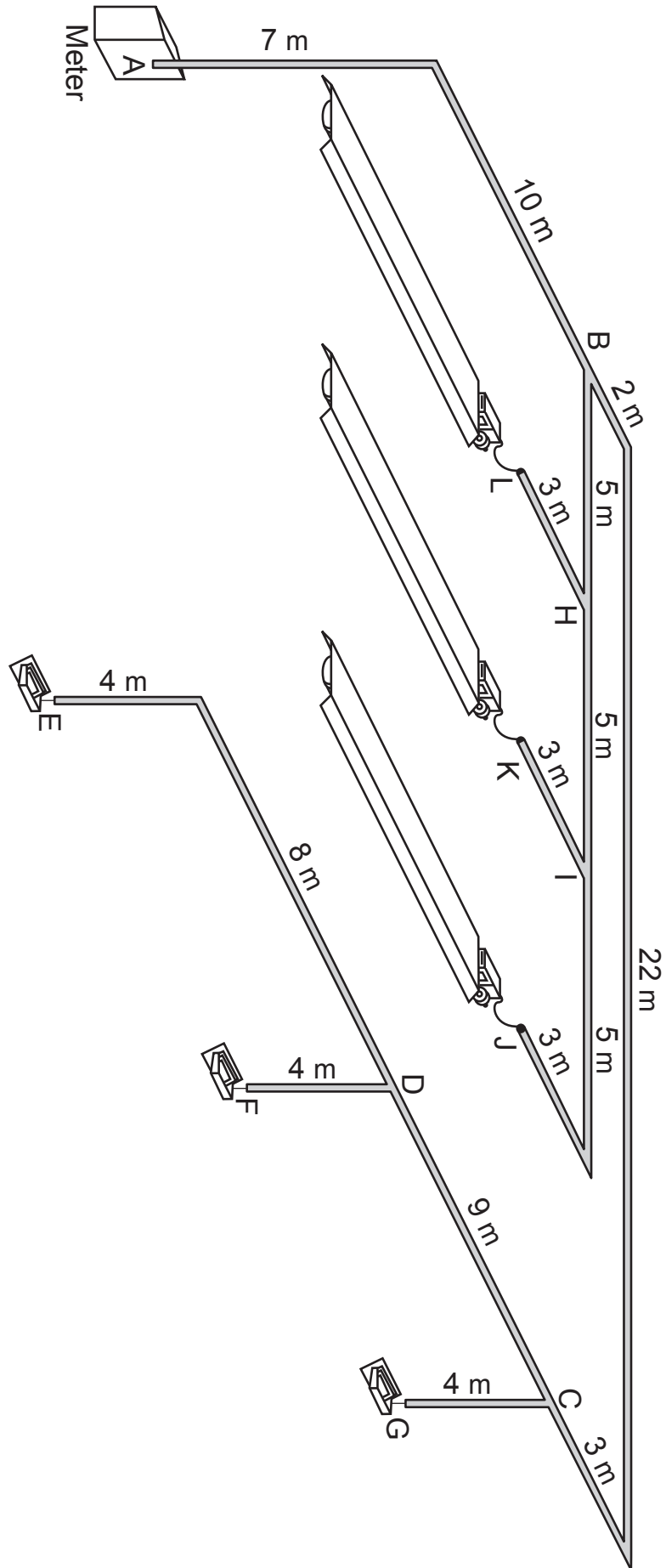
Using NZS 5261, pipe size the installation for copper pipe with a supply pressure of 2.3 kPa.

Section	MJ	Pipe Size	Section	MJ	Pipe Size
A-B			B-C		
B-H			C-G		
H-L			C-D		
H-I			D-F		
I-K			D-E		
I-J					

Length of longest run	
Design pressure drop	
Installation pressure drop/m	

Total 19 marks

QUESTION 5 (cont'd)



QUESTION 6

Answer the following questions in accordance with New Zealand Building Code Clause E2/AS1 External Moisture.

- (a) A corrugated iron roof has a pitch of 15° . The maximum wind speed expected for the location is 45 metres per second. A 150 mm gas application flue has been installed penetrating 500 mm below the ridge.

Sketch a diagram showing the flashing requirements for the installation. Show all measurements.

(8 marks)

QUESTION 6 (cont'd)

- (b) A 100 mm galvanised gas dryer vent is being installed to penetrate the external wall of a wooden framed house with brick cladding.

List the steps required to ensure that the penetration is weather tight.

(3 marks)

- (c) Give the TWO conditions that are required to be met for the use of flexible flashing tape to comply with New Zealand Building Code clause E2/AS1 External Moisture.

1 _____

2 _____

(2 marks)

Total 13 marks

QUESTION 7

(a) List FOUR kinds of gasfitting that require certification according to the Gas (Safety and Measurement) Regulations 2010.

1 _____

2 _____

3 _____

4 _____

(4 marks)

(b) List TWO kinds of gasfitting that are deemed to be exempt from certification according to the Gas (Safety and Measurement) Regulations 2010.

1 _____

2 _____

(2 marks)

(c) Name TWO different types of safety system that are designed to prevent harm to persons working at height, and state how each system achieves its purpose.

1 _____

2 _____

(4 marks)

Total 10 marks

QUESTION 8

Answer the following questions in relation to NZS 5261 Gas Installation.

- (a) Copper pipe work conveying gas at 8.5 kPa is to be installed in a rectangular cavity in the ceiling of a building. Each end of the cavity measures 2.8 m by 3 m.

Determine the ventilation requirements for the cavity.

(3 marks)

- (b) List FOUR aspects related to an installation that must be taken into account before the suitability of a proprietary piping system can be confirmed.

1 _____

2 _____

3 _____

4 _____

(2 marks)

Total 5 marks

QUESTION 9

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

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

(2 marks)

(b) List FIVE actions required of an employer following an event which has resulted in serious harm.

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

(5 marks)

Total 7 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 in this section of the examination no marks will be awarded for that question.

1. Other than a portable space heater, when is it permissible for a gas appliance fitted with wheels and a flexible hose to not be fitted with a device that will restrict the movement of the appliance?

- A When it has a mass of 20 kg or less.
- B When it is installed in a commercial kitchen.
- C When the mass of the appliance exceeds 30 kg.
- D When the width of the appliance exceeds its height.
- E When it is installed below an air extraction unit.

2. When an appliance is fitted with a 500 mm flexible hose, a fitted restraint device should restrict the movement to not greater than what measurement?

- A 250 mm.
- B 300 mm.
- C 350 mm.
- D 450 mm.
- E 500 mm.

3. NZS 5261 Gas Installation states that marker tape should be located at which of the following measurements?

- A 150 mm - 300 mm below finished ground level.
- B 300 mm - 350 mm below finished ground level.
- C 100 mm - 200 mm above the buried service.
- D 200 mm - 300 mm above the buried service.
- E 300 mm - 400 mm above the buried service.

4. According to NZS 5261 Gas Installation, what is the minimum depth a pipe conveying gas at 30 PSI under a driveway should be?
- A 300 mm.
 - B 450 mm.
 - C 600 mm.
 - D 650 mm.
 - E 800 mm.
-

5. An appliance regulator is not required for LPG appliances so long as the consumer piping pressure does not exceed what pressure?
- A 3.5 kPa.
 - B 5 kPa.
 - C 7 kPa.
 - D 10 kPa.
 - E 14 kPa.
-

6. According to NZS 5428, what is the maximum length of high pressure flexible piping allowed between a cylinder and the regulator?
- A 600 mm.
 - B 900 mm.
 - C 1000 mm.
 - D 1200 mm.
 - E 1500 mm.
-

7. According to the Gas (Safety and Measurement) Regulations 2010, within what time after finishing a gas installation must a gas certification be completed?
- A 5 working days.
 - B 10 working days.
 - C 15 working days.
 - D 20 working days.
 - E 60 working days.
-

8. According to the Gas (Safety and Measurement) Regulations 2010, once certification of gasfitting has been completed an original of the certificate must be supplied to the Plumbers, Gasfitters and Drainlayers Board within how many days?

- A 5 days.
- B 10 days.
- C 15 days.
- D 20 days.
- E 60 days.

9. According to NZS 5261 Gas Installation, why must flues not be located in ventilation shafts?

- A The flue heat could increase the temperature of the ventilation air.
- B The ventilation air could cool the flue, interfering with flue draught.
- C The seal between the flue and the ventilation shaft could leak due to expansion.
- D Any flue gases that may leak from the flue could be spread within the building.
- E The flue could be an obstruction, interfering with air movement within the ventilation shaft.

10. According to NZS 5261 Gas Installation, what is the correct sequence of the controls on the inlet side of a gas pressure raising device?

- A Manual shut-off valve, non-return valve, manual reset low pressure switch.
- B Manual shut-off valve, manual reset low pressure switch, non-return valve.
- C Non- return valve, manual reset low pressure switch, manual shut-off valve.
- D Manual reset low pressure switch, manual shut-off valve, non-return valve.
- E Manual reset low pressure switch, non-return valve, manual shut-off valve.

11. According to NZS 5261 Gas Installation, a power flue which discharges up to 4 m from ground level must be designed to ensure what maximum concentration of carbon dioxide of the flue gases?

- A 1%.
- B 8%.
- C 12%.
- D 15%.
- E 25%.

12. According to NZS 5261 Gas Installation, what increase in design capacity may be allowed for when designing a natural draught flue if the flue is to be an enclosed or insulated low heat loss flue?

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

13. The flue sizing tables included in NZS 5261 Gas Installation have been calculated for approximately what percentage down draught diverter dilution air?

- A 25%.
- B 50%.
- C 75%.
- D 80%.
- E 100%.

14. According to NZS 5261 Gas Installation, what is the diameter of the smallest circular natural draught flue pipe permitted?

- A 50 mm.
- B 55 mm.
- C 65 mm.
- D 75 mm.
- E 90 mm.

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

16. Every employer shall take all practicable steps to ensure means are provided to prevent an employee from falling where the employee may fall more than what height?

- A 2 m.
- B 2.5 m.
- C 3 m.
- D 3.5 m.
- E 5 m.

17. What is the minimum distance from the ground of a bayonet fitting that is to be located outdoors must be?

- A 200 mm.
- B 300 mm.
- C 400 mm.
- D 500 mm.
- E 600 mm.

18. According to NZS 5261 Gas Installation, which of the following is the minimum clearance between a single wall, rectangular, metal flue and an unprotected combustible surface?

- A 25 mm.
- B 50 mm.
- C 75 mm.
- D 300 mm.
- E 450 mm.

Total 18 marks

For Examiner's use only

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