

Affix label with Candidate Code
Number here.
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Number if known

No. 9193



Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2007

GASFITTING

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, ask the Supervisor for extra sheets. Write your Candidate Code Number and the number 9193 on any extra sheets used, and attach them to this booklet. **NO SEPARATE ANSWER BOOKLET IS TO BE USED.** Write the number of extra sheets used in the box on the last page of this booklet. Write NIL if you have not used any.

All working in calculations must be shown.

Candidates are permitted to use the following in this examination:

Drawing instruments, approved calculators

The following are NOT permitted in the examination room:

Any publications, Acts, Regulations, Codes of Practice, or Standards

Check that this booklet has all of 12 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

QUESTION 1

(a) To comply with NZS 3604, state THREE conditions that determine the position and size of a hole to be drilled through a wooden floor joist for a gas pipe.

1 _____

2 _____

3 _____

(3 marks)

(b) To comply with NZS 5261, state SIX conditions that must be met when a gas pipe is embedded directly within a concrete floor slab.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

(6 marks)

QUESTION 1 (cont'd)

(c) To comply with NZS 5261, state THREE requirements for an underground gas pipe that passes through the outer wall of a building.

- 1 _____
- 2 _____
- 3 _____

(3 marks)

(d) List FOUR types of fittings that are unsuitable for joining gas installation pipes, as specified in NZS 5261.

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

(2 marks)

(e) Why must the gas velocity be restricted in gas pipework?

(1 mark)

Total 15 marks

QUESTION 2

(a) Name and describe TWO tests used to determine how well a natural draught flue is working.

Name _____

Description _____

Name _____

Description _____

(4 marks)

(b) State FOUR factors to be considered in selecting the position for an open flue terminal.

1 _____

2 _____

3 _____

4 _____

(2 marks)

(c) State TWO possible dangers if the heat exchanger of a domestic warm air heating unit has a hole in it.

1 _____

2 _____

(2 marks)

Total 8 marks

QUESTION 3

- (a) List SIX individual components that are incorporated in a multi-function gas control valve fitted to a domestic gas fired storage water heater.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

(6 marks)

- (b) State THREE reasons for providing ventilation for a gas fired water heater installed in a cupboard.

1 _____

2 _____

3 _____

(3 marks)

Total 9 marks

QUESTION 4

(a) Give TWO reasons why polyethylene pipes should not be used above ground.

1 _____

2 _____

(2 marks)

(b) State the purpose of a pigtail on an LPG installation, and state where it should be located.

Purpose _____

Location _____

(2 marks)

(c) State THREE advantages of using polyethylene pipe instead of steel pipe for underground gas service lines.

1 _____

2 _____

3 _____

(3 marks)

Total 7 marks

QUESTION 5

- (a) Complete the line diagram below, using correct symbols, to show the gas meter and associated equipment that are required to connect a metal gas service riser pipe to a domestic installation. Label each component.



(5 marks)

- (b) Give TWO reasons why it is necessary to position the gas meter clear of openings into the house.

1 _____

2 _____

(2 marks)

- (c) If the gas meter test dial shows an advance of 0.025 m³ in 30 seconds, calculate the hourly gas rate.

(2 marks)

QUESTION 5 (cont'd)

(d) State why is it necessary to use a bridging strap when removing a gas meter.

(1 mark)

(e) Draw a diagram to show all the requirements, including depths, for a polyethylene gas pipe operating at 100 kPa laid under a lawn within a private property.

(3 marks)

Total 13 marks

QUESTION 6

(a) Describe the operation of a balanced flue fitted to a space heater.

(4 marks)

(b) Describe the operation of a thermo-electric flame failure device fitted to a space-heating appliance.

(4 marks)

c) State FOUR likely causes of flames that are emerging from the top of the radiants of a flued gas space heater. (Assume that the gas rate to the appliance is correctly set.)

1

2

3

4

(4 marks)

Total 12 marks

QUESTION 7

(a) List FOUR components that would normally be provided by the gas supplier as part of the metering set for a domestic dwelling.

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

(4 marks)

(b) Describe the opening and closing actions for an automatic safety shut-off valve fitted to an industrial gas burner train that does not have a separate pilot supply.

- _____
- _____
- _____

(2 marks)

(c) State FOUR functions of a programmable control unit (PCU) on a package burner.

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

(4 marks)

QUESTION 7 (cont'd)

- (d) By deleting the incorrect word in each box in the following table, indicate the status of the equipment in each stage of the operating sequence for an automatic gas burner.

Stage	Fan	Igniter	Flame Detector	Pilot Burner Control Valve	Main Burner Control Valve
Pre-purge	On / Off	On / Off	On / Off	Open / Closed	Open / Closed
Start flame establishment	On / Off	On / Off	On / Off	Open / Closed	Open / Closed
Start flame proving	On / Off	On / Off	On / Off	Open / Closed	Open / Closed
Main flame establishment	On / Off	On / Off	On / Off	Open / Closed	Open / Closed
Full operation	On / Off	On / Off	On / Off	Open / Closed	Open / Closed
Post-purge	On / Off	On / Off	On / Off	Open / Closed	Open / Closed

(6 marks)

- (e) Sketch a cross section of a device suitable for providing reverse flow protection in a gas line. Indicate the normal direction of flow.

(3 marks)

Total 19 marks

QUESTION 8

(a) State why it is important to ventilate a confined space when there has been a gas leak.

(2 marks)

(b) State TWO characteristics of a gas flame when the primary air is closed off.

1

2

(2 marks)

(c) State TWO reasons for odourising natural gas or liquefied petroleum gas.

1

2

(1 mark)

(d) Name the dangerous gas produced when there is incomplete combustion.

(1 mark)

(e) Name the TWO principle constituents of biogas.

1

2

(2 marks)

Total 8 marks

QUESTION 9

(a) List FIVE prohibited locations for installation of quick connect device sockets (bayonet fittings) for gas hose assemblies.

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

(5 marks)

(b) Name, in full, FOUR Acts of Parliament under which gasfitters operate.

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

(4 marks)

Total 9 marks

For Candidate's use

Number of EXTRA sheets used (write NIL if none have been used).	
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For Examiner's use only

Questions Answered	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
8		
9		
Total		