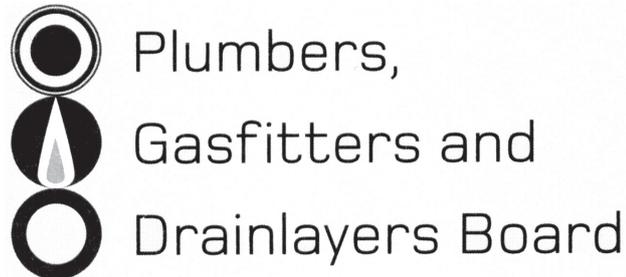


Affix label with Candidate Code
Number here.
If no label, enter candidate
Number if known

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No. 9196



REGISTRATION EXAMINATION, JUNE 2010

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.

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

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 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

QUESTION 1

(a) State THREE types of gasfitting work that require certification under the Gas Industry Regulations.

- 1 _____
- 2 _____
- 3 _____

(3 marks)

(b) State the maximum time, after completion of gasfitting, that the gasfitting certification certificate must be received by the Plumbers, Gasfitters, and Drainlayers Board.

(1 mark)

(c) List FOUR items of information that must be permanently marked on every gas appliance.

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

(2 marks)

(d) State TWO actions a gasfitter is required to take if he or she finds an unsafe gas appliance that presents a danger to life or property.

- 1 _____
- 2 _____

(2 marks)

(e) A registered gasfitter is carrying out a gasfitting installation.

State the legal requirement that must be met on completion of the work.

(1 mark)

Total 9 marks

QUESTION 2

(a) Name and briefly describe TWO methods of cathodic protection for a buried and wrapped steel gas line.

- 1 _____

- 2 _____

(2 marks)

(b) (i) If gas is metered at high pressure, state what must be done to obtain the true consumption.

(1 mark)

(ii) State TWO ways that the adjustment in (i) can be carried out.

- 1 _____
- 2 _____

(2 marks)

(c) List SIX locations in which the installation of quick connect device sockets for gas hose assemblies are prohibited under NZS 5261.

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

(3 marks)

QUESTION 2 (cont'd)

(d) Give TWO requirements regarding the installation of quick connect device sockets and connection points for hose assemblies that must be met to comply with NZS 5261.

1 _____

2 _____

(2 marks)

(e) List FIVE locations in which the installation of above ground gas pipework within a building envelope is prohibited under NZS 5261.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks)

(f) A caravan has two 9 kg LPG cylinders that are connected.

Specify FOUR requirements that the gas pipework must meet.

1 _____

2 _____

3 _____

4 _____

(4 marks)

Total 19 marks

QUESTION 3

- (a) A room measures 5.000 m × 3.200 m and has a ceiling height of 2.700 m. The heat input per cubic metre of room volume is to be 0.36 MJ/h.

Calculate the heat input required for the room in kW. Show your working.

(2 marks)

- (b) A 12 MJ flueless panel heater is to be installed in a hallway having a ceiling height of 2.400m. NZS 5261 sets a limit of 0.4 MJ/h/m³ for a flueless space heater in a hallway.

Calculate the minimum floor area the hallway can have in square metres. Show your working.

(2 marks)

- (c) An open flued gas-fired storage water heater is to be installed in a garage attached to a house.

Give FOUR specific requirements that the installation must meet for it to comply with NZS 5261.

1 _____

2 _____

3 _____

4 _____

(4 marks)

QUESTION 3 (cont'd)

- (d) A gas-fired storage water heater has been installed. A gas pipework soundness test is to be carried out.

Give the steps in the test for the installation to comply with NZS 5261.

(3 marks)

- (e) List FIVE checks, other than a pressure test, that are required before an internal gas-fired storage water heater can be certified.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks)

QUESTION 3 (cont'd)

(f) A balanced flue space heater is to be installed on an external wall of a living room.

(i) State TWO key safety factors to be considered in selecting the position for the appliance.

1 _____

2 _____

(2 marks)

(ii) Clearly draw and label a cross-sectional diagram of the heater to show the complete flueing arrangements.

(4 marks)

Total 22 marks

QUESTION 4

(a) State FIVE factors that may affect the overall efficiency of a gas-fired storage water heater system.

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

(5 marks)

(b) A registered gasfitter working under the direction of a craftsman gasfitter has installed a gas-fired continuous flow water heater.

Identify EIGHT items of information that the craftsman gasfitter should obtain about the installation to ensure that all required actions have been carried out by the registered gasfitter.

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

(4 marks)

Total 9 marks

QUESTION 5

- (a) A new commercial gas installation consists of 200 m of 50 mm pipe, with several branches to individual appliances. The installation is to use natural gas.

List, in order, the steps in the purging procedure for the installation so the procedure will comply with NZS 5261.

(6 marks)

- (b) Identify FOUR design requirements for a direct-fired make up air heater system suitable for a commercial building.

1 _____

2 _____

3 _____

4 _____

(4 marks)

QUESTION 5 (cont'd)

- (c) Some commercial appliances such as pottery kilns are normally installed without down draught diverters. As a consequence, special conditions apply to the flues of these appliances.

Give FOUR of the special conditions.

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

(2 marks)

- (d) Where several commercial catering appliances are connected to a common gas supply pipe, special gas isolation arrangements are required.

State THREE of these requirements.

- 1 _____
- 2 _____
- 3 _____

(3 marks)

Total 15 marks

QUESTION 6

(a) For each of the following burner types, state the conditions that apply to the gas and combustion air supply.

(i) Natural draught radiant burner

(ii) Forced draught nozzle mix burner

(iii) Air blast burner

(3 marks)

(b) For each of the following burner types, state where the gas/air mixing occurs.

(i) Natural draught radiant burner

(ii) Forced draught nozzle mix burner

(iii) Air blast burner

(3 marks)

(c) Give THREE possible reasons why a package burner shuts down and goes to lock out.

1 _____

2 _____

3 _____

(3 marks)

QUESTION 6 (cont'd)

(d) Describe the process of flame rod rectification.

(3 marks)

(e) An existing regulator controlling the gas supply to a burner train is required to supply a greater volume of gas and deliver a higher pressure.

Identify the TWO components of the regulator that may need to be changed and give a reason for each. Assume all other equipment is suitable for the increased throughput.

Component to be changed _____

Reason _____

Component to be changed _____

Reason _____

(4 marks)

Total 16 marks

QUESTION 7

(a) A natural draught flue is being designed for a gas appliance.

State SIX factors to be taken into account when calculating the size of the flue.

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

(3 marks)

(b) A natural draught flue for a gas appliance is being designed.

State FOUR ways in which condensation in the flue can be minimised.

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

(4 marks)

(c) The ventilation for a plant room containing gas appliances is being designed.

State TWO factors that must be considered in determining the location of the ventilation grilles.

- 1 _____

- 2 _____

(1 mark)

QUESTION 7 (cont'd)

(d) A gas boiler has been installed in a plant room. The gas boiler has an energy input of 1050 kW.

Using table 13 below, calculate the natural free ventilation area required if the ventilation is directly to outside.

Formula:
 $A = F \times T$

where

A = the minimum free ventilation area in mm²

F = the factor from table 13

T = the total gas consumption of all appliances in MJ/h

Table 13 – Ventilation

Gas appliance location	Source of ventilation	Factor F
Gas appliance in a room or enclosure, other than a plant room	Directly to outside	300
	Via an adjacent room	600
Gas appliance in a plant room	Directly to outside	150
	Via an adjacent room	300

NOTE – The term ‘directly to outside’ means any one of the following options, provided that the ventilation path is unobstructed by building material or insulation.

- (1) Directly through an outside wall (preferred option).
- (2) Through an outside wall but offset.
- (3) Into a cavity ventilated to outside.
- (4) Into an underfloor space ventilated to outside.
- (5) Into a roof space ventilated to outside.

(2 marks)

Total 10 marks

For Examiner's use only

Question number	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
Total		