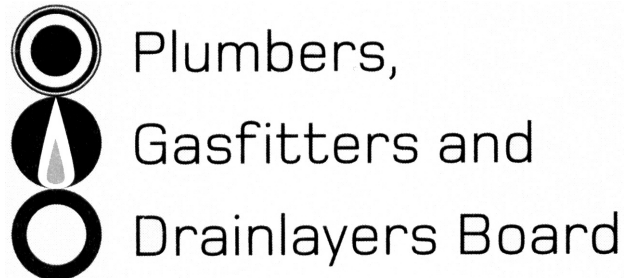


Affix label with Candidate Code
Number here.
If no label, enter candidate
Number if known

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No. 9193



REGISTRATION EXAMINATION, 2006

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 15 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 reasons for fitting a down-draught diverter.

- 1 _____
 - 2 _____
 - 3 _____
- (3 marks)

(b) What is a secondary flue pipe?

(2 marks)

(c) Name the dangerous gas produced when there is incomplete combustion of the fuel gas.

(1 mark)

(d) List SIX materials that are acceptable for manufacturing flue pipes.

- 1 _____
 - 2 _____
 - 3 _____
 - 4 _____
 - 5 _____
 - 6 _____
- (3 marks)

(e) State the minimum distance permitted from a 100 mm diameter flue without a flue liner to any combustible material.

(1 mark)

(f) What is required to be fitted to the top of a flue pipe?

(1 mark)

Total 11 marks

QUESTION 2

(a) State THREE processes by which iron gas pipes can be corroded.

- 1 _____
 - 2 _____
 - 3 _____
- (3 marks)

(b) Explain TWO methods of preventing corrosion of iron pipes.

- 1 _____

 - 2 _____

- (4 marks)

(c) Explain TWO ways a copper gas pipe can be protected when laid under a concrete slab floor.

- 1 _____

 - 2 _____

- (2 marks)

(d) State TWO essential features of supports for gas pipework running overhead through a building.

- 1 _____

 - 2 _____

- (2 marks)

Total 11 marks

QUESTION 3

- (a) A pool heater is to be located across a lawn. The gas supply pipe is to be laid under the lawn. List EIGHT steps which are necessary to lay a polyethylene gas supply line to the swimming pool heater from an existing installation.

| | |
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(8 marks)

- (b) Give THREE reasons why a polyethylene (PE) pipe must be replaced by a metal pipe before an unsleeved gas supply pipe rises above ground to connect to a gas appliance.

| | |
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(3 marks)

Total 11 marks

QUESTION 4

- (a) An LPG appliance has an energy input of 5 kW. Calculate the gas rate in m^3/hr for the appliance given the heating value of LPG is $90 \text{ MJ}/\text{m}^3$.
Note: $1 \text{ kW} = 3.6 \text{ MJ}$.

(2 marks)

- (b) A room measures 6 m by 4.5 m with a stud height of 2.7 m. Calculate the size of the space heater required for the room, given that a heat output of $0.4 \text{ MJ}/\text{m}^3$ of room volume is required for comfort conditions.

(2 marks)

QUESTION 4 (cont'd)

- (c) A commercial gas installation consists of 15 m of 50 mm diameter pipe, 30 m of 25 mm pipe, and 10 m of 15 mm pipe. Calculate the total volume of the pipework for purging and testing purposes. Give your answer in litres.

(3 marks)

Total 7 marks

QUESTION 5

- (a) A small area at one end of a warehouse requires heating to a suitable temperature for staff working for short periods at a workbench. Name the type of gas-fired heater which would be the most suitable for this application and give the reason. State where the heater should be located.

Type: _____

Reason: _____

Location: _____

(3 marks)

- (b) State TWO reasons why the Installation Standard requires there to be clearances around wall-mounted flueless heaters.

1 _____

2 _____

(2 marks)

Total 5 marks

QUESTION 6

(a) State the function of each of the following systems fitted to a package burner:

1 Gas control system

2 Air control system

3 Ignition control system

4 Flame control system

(4 marks)

(b) State the THREE steps in the operating sequence of a two-stage automatic safety shut off valve fitted to an industrial furnace.

1

2

3

(3 marks)

(c) Some appliances contain an overheat switch and a thermostat. Explain their relationship.

(1 mark)

Total 8 marks

QUESTION 7

(a) State TWO advantages of using a gas-fired radiant panel heater in a warehouse.

- 1 _____

 - 2 _____

- (2 marks)

(b) State TWO likely causes if a domestic space heater ignites explosively.

- 1 _____

 - 2 _____

- (2 marks)

(c) State TWO purposes of a gas burner injector.

- 1 _____

 - 2 _____

- (2 marks)

(d) State TWO requirements that must be met when choosing the position for an open vented flue terminal.

- 1 _____

 - 2 _____

- (2 marks)

(e) State TWO reasons for carrying out flue gas analysis on an industrial gas fired boiler.

- 1 _____

 - 2 _____

- (2 marks)

Total 10 marks

QUESTION 8

- (a) A gas installation that has several appliances is to be designed. State SIX factors to be considered when determining the pipe sizes in the installation.

- 1 _____

- 2 _____

- 3 _____

- 4 _____

- 5 _____

- 6 _____

(3 marks)

- (b) List SIX features to be considered in selecting a manual shut-off valve for a gas installation.

- 1 _____

- 2 _____

- 3 _____

- 4 _____

- 5 _____

- 6 _____

(3 marks)

QUESTION 8 (cont'd)

- (c) Explain why a gas pipe should not be used as a component of an earthing system.

(1 mark)

- (d) State what should be installed to prevent a potential difference between a metal gas pipe and earth.

(1 mark)

Total 8 marks

QUESTION 9

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

1 _____

2 _____

3 _____

(3 marks)

(b) List, in the correct order, SEVEN steps that are required to safely purge air from a new domestic gas installation with an open burner.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

(7 marks)

QUESTION 9 (cont'd)

- (c) Sketch, label and describe the appearance of a correctly adjusted pre-aerated natural gas flame.

(4 marks)

- (d) State TWO characteristics of a pre-aerated gas burner flame if the primary air inlet becomes blocked.

1 _____

2 _____

(2 marks)

- (e) Define what is meant by 'LOCK-UP' pressure in relation to a gas installation.

(1 mark)

Total 17 marks

QUESTION 10

- (a) Name and describe the TWO types of pressure test that you would carry out prior to commissioning a new gas installation.

1 _____

2 _____

(4 marks)

- (b) You are required to install a new space heater into an existing gas line. Name and describe the pressure test required prior to commencing work.

(2 marks)

- (c) State TWO sources for information on the working pressure of a gas appliance that must be supplied with the appliance.

1 _____

2 _____

(2 marks)

- (d) What other requirement, in addition to gasfitting registration and holding a current licence, is needed for a gasfitter to be able to work on the water connections of a gas fired water heater?

(1 mark)

QUESTION 10 (cont'd)

- (e) State the condition under which a registered gasfitter is permitted to test gas installation work.

(1 mark)

- (f) State TWO basic reasons required by the NZ Building Code for ventilation when gas appliances are installed.

1

2

(2 marks)

Total 12 marks

For Candidate's use

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

| Questions Answered | Marks |
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| 1 | |
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