

Affix label with Candidate Code
Number here.
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Number if known

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No. 9193



Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2008

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, use the blank pages at the back of this booklet. Clearly write the question number 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 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

QUESTION 1

A consumer has requested that a maintenance check be carried out on a gas fired storage water heater that is installed in a cupboard. List and briefly describe TEN checks that should be carried out on the water heater installation.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

7 _____

8 _____

9 _____

10 _____

Total 10 marks

QUESTION 2

(a) A gas meter is situated in a driveway. Give TWO methods of protecting the meter from physical damage.

1 _____

2 _____

(2 marks)

(b) A gas pipe is to be concealed in a wall.

(i) Give an acceptable method of jointing the pipe.

(ii) State what must be done after jointing the pipe.

(1 mark)

(c) List THREE symptoms of carbon monoxide poisoning.

1 _____

2 _____

3 _____

(3 marks)

Total 6 marks

QUESTION 3

State TWO advantages of using polyethylene pipes (MDPE) for below ground gas pipelines.

1 _____

2 _____

Total 2 marks

QUESTION 4

(a) A steel gas pipe is to be buried below ground. The pipe is to be protected against corrosion with a tape wrapping system.

(i) State the TWO materials that should be used to wrap the pipe.

- 1 _____
- 2 _____

(ii) Give the reasons why two materials should be used to wrap the pipe.

(iii) Describe a suitable process of wrapping the pipe.

(5 marks)

(b) Give TWO reasons why a steel gas pipe should not be laid directly on the ground.

- 1 _____
- 2 _____

(2 marks)

QUESTION 4 (cont'd)

(c) A gas supply pipe is to pass through a foundation wall of a building. State FOUR requirements that must be met, and give the reason for each.

1 Requirement: _____

Reason: _____

2 Requirement: _____

Reason: _____

3 Requirement: _____

Reason: _____

4 Requirement: _____

Reason: _____

(4 marks)

(d) A gas riser pipe operating at a maximum pressure of 7kPa is to be installed in a vertical duct with other services. State FIVE requirements that must be met.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks)

(e) An insulating joint is installed in a gas pipe at the point where the pipe comes out of the ground. Give TWO reasons for this.

1 _____

2 _____

(2 marks)

Total 18 marks

QUESTION 5

The diagram opposite shows a plan for an LPG gas installation. Copper piping is to be used in the installation.

Allow a pressure drop of 0.009 kPa/m.

The energy value (input rate) of the gas is 85 MJ/m³.

1 kW = 3.6 MJ

Formula: Volume = D² x 0.7854 x L

- (a) From the diagram, calculate the index length.

(1 mark)

- (b) Using the diagram, the information provided below and figure E7 from NZS 5261 opposite, complete Table 1.

	Appliance	Input Rating
A	Cooker	14.72 kW
B	Clothes drier	4.45 kW
D	Continuous flow water heater	199 MJ
F	Flame effect fire	35 MJ
I	Continuous flow water heater	160 MJ

TABLE 1

Pipe Run	Length (m)	Gas Flow (MJ/h)	Diameter (mm)
A-C			
B-C			
C-E			
D-E			
E-G			
F-G			
G-H			
H-I			
H-J			

(10 marks)

QUESTION 5 (cont'd)

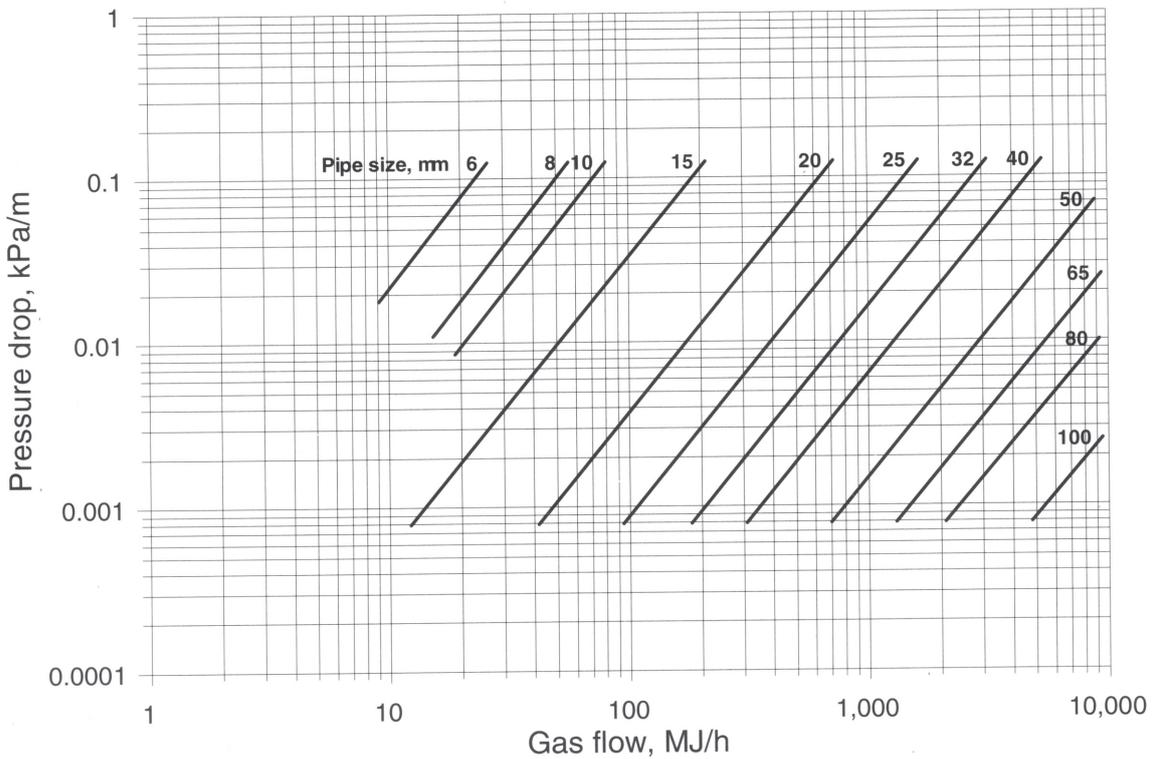
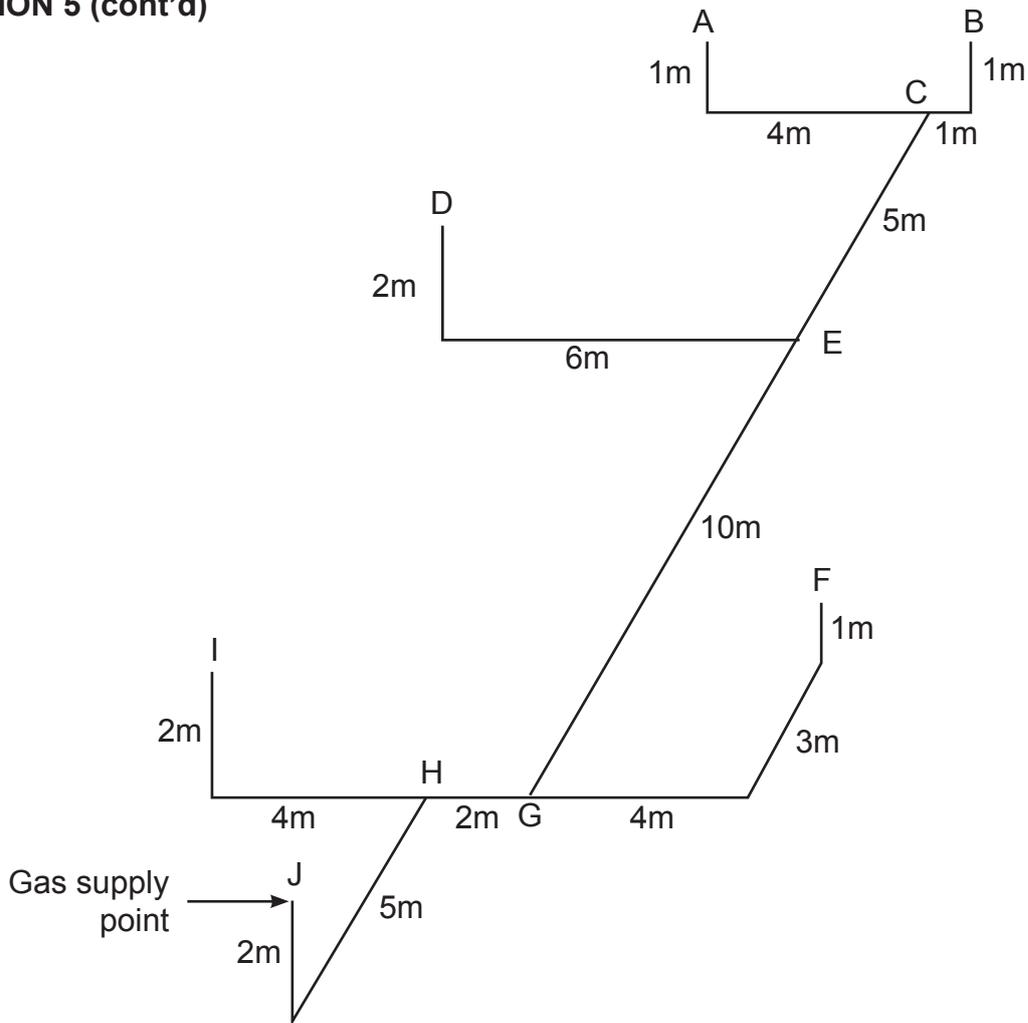


Figure E7 – Pipe sizing for LPG (propane) in copper pipe

QUESTION 5 (cont'd)

Refer to the LPG gas installation on pages 6 and 7.

- (c) Calculate the volume of the pipework for testing and purging purposes. Give your answer in litres.

(3 marks)

- (d) Calculate the volume of gas used per hour if all appliances are operating on full.

(1 mark)

Total 15 marks

QUESTION 6

With the aid of a simple sketch, describe the operation of a direct fired air heater suitable for use in a large workshop.

Description of operation

Total 5 marks

QUESTION 7

(a) State FOUR advantages of using gas fired radiant heaters in a warehouse.

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

(4 marks)

(b) List FOUR factors that affect the comfort of the occupants of a building in relation to the building's heating and ventilation system.

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

(4 marks)

Total 8 marks

QUESTION 8

Each of the controls listed in the table below is fitted to a domestic gas fired storage water heater. State the type (not make or model) of each control and its purpose.

Control	Type	Purpose
Flame failure device		
Thermostat		
Pilot adjuster		
Energy cut off device		

Total 4 marks

QUESTION 9

A new domestic gas installation is to have a working pressure of 2.75 kPa. Prior to certification, it is essential to carry out soundness tests and to adjust the gas rate for each appliance.

- (a) Briefly describe the TWO soundness tests that are required, stating the type of test, the components being tested and the test pressure(s) for each.

1

2

(6 marks)

QUESTION 9 (cont'd)

(b) An upright gas cooker has four hotplate burners, a grill and an oven. List SIX steps in the process of checking and setting the gas rate for the appliance.

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

(6 marks)

(c) The gas meter test dial shows that a volume of 0.04 m³ has passed in 3 minutes. Calculate the heat input per hour. The heating value of the gas is 90 MJ/m³. Show all working.

(2 marks)

Total 14 marks

QUESTION 10

State the purpose of an excess flow valve in a gas supply line, and explain how it operates.

Purpose: _____

Explanation: _____

Total 3 marks

QUESTION 11

(a) Describe how biogas is created.

(2 marks)

(b) List the TWO principal constituents of biogas.

1 _____

2 _____

(2 marks)

(c) List the TWO principal components of liquefied petroleum gas (LPG).

1 _____

2 _____

(2 marks)

(d) State the essential feature of an inert gas, and name one inert gas.

Essential feature: _____

Name: _____

(2 marks)

Total 8 marks

QUESTION 12

A digger breaks a gas supply line. Large volumes of gas are escaping into the atmosphere.

List SEVEN safety procedures to be followed.

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

Total 7 marks

For Examiner's use only

Question number	Marks	Marks
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
Total		