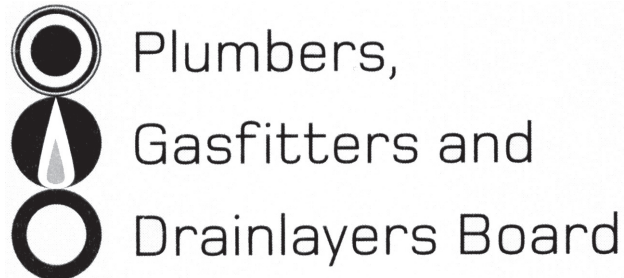


Affix label with Candidate Code
Number here.
If no label, enter candidate
Number if known

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No. 9193



REGISTRATION EXAMINATION, JUNE 2016

LICENSED 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 2016 were provided with the following documents:

- AS/NZS 5601 Part 1: General installations
- AS/NZS 5601 Part 2: LP Gas installations in caravans and boats for non-propulsive purposes

USEFUL FORMULAE

Circumference of circle = $2 \times \pi \times R$ or Circumference of circle = $\pi \times D$

Area of circle = $\pi \times R^2$ or Area of circle = $0.7854 \times D^2$

Volume of cylinder = $\pi \times R^2 \times H$ or Volume of cylinder = $0.7854 \times D^2 \times H$

Heating time = $\frac{\text{mass of water (kg)} \times 4.2 \times \text{temp diff (}^\circ\text{C)} \times 100}{\text{heat energy input per hour in kJ} \times \text{efficiency (\%)}}$

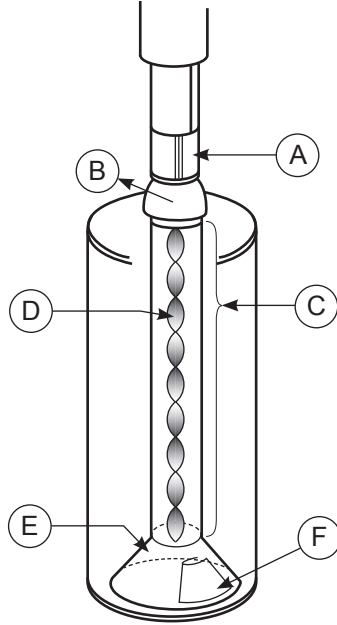
Correction factor = $\frac{\text{atmospheric pressure} + \text{supply pressure}}{\text{atmospheric pressure}}$

Gas rate (m³/h) = $\frac{\text{volume (m}^3\text{)} \times 3600}{\text{time (seconds)}}$

SECTION A

QUESTION 1

The picture below shows a gas-fired storage water heater.



Complete the table giving the name and the purpose of each part labelled A – F.

Part	Name	Purpose
A		
B		
C		
D		
E		
F		

Total 12 marks

QUESTION 2

A hob was removed from a house and taken to a workshop.

At the workshop, a faulty hotplate control valve was replaced.

- (a) Give FOUR checks/tests that must be carried out once the repaired appliance is refitted at the house.

1 _____

2 _____

3 _____

4 _____

(4 marks)

- (b) To start each hotplate, the control knob needs to be held in for 15 seconds after the burner has lit in order to the burner to operate.

Give the full name of the device that this indicates is incorporated into the appliance.

(1 mark)

- (c) When trying to light the burner the flame goes out once the control knob is released.

Give FIVE likely causes of this fault.

1 _____

2 _____

3 _____

4 _____

5 _____

(5 marks)

QUESTION 2 (cont'd)

(d) List FOUR different ignition systems used on gas appliances.

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

(2 marks)

Total 12 marks

QUESTION 3

Appliances in an existing residence are connected to an LPG twin pack.

The owner has requested the installation of four additional appliances.

- (a) Give FOUR checks regarding the existing gas supply that should be carried out before the new appliances are installed.

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

(4 marks)

- (b) According to AS/NZS 5601 Part 1, give TWO actions that must be performed on a section of pipework which is to be permanently disconnected from the installation.

- 1 _____
- 2 _____

(2 marks)

Total 6 marks

QUESTION 4

(a) Give FIVE factors to be considered when deciding the location for an LPG twin pack exchange cylinder station.

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

(5 marks)

(b) An LPG cylinder with a capacity greater than 12 litres is to be installed for public use in an area with unrestricted access.

AS/NZS 5601 Part 1 gives two recommendations regarding the location and storage of the cylinder.

Give these TWO recommendations.

- 1 _____
- 2 _____

(2 marks)

Total 7 marks

QUESTION 5

(a) Give FOUR circumstances in relation to the operation of a gas appliance that can lead to the production of excessive carbon monoxide.

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

(4 marks)

(b) Give the full name and meaning of each of the following abbreviations.

(i) UEL

Name: _____

Meaning: _____

(2 marks)

(ii) LEL

Name: _____

Meaning: _____

(2 marks)

Total 8 marks

QUESTION 6

(a) Give FOUR different situations where a gas tightness test must be performed on a gas installation.

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

(4 marks)

(b) While testing for gas tightness, a pressure drop is observed.

No leak can be located on the installation.

List THREE probable causes of the observed pressure drop.

- 1 _____
- 2 _____
- 3 _____

(3 marks)

(c) While the static pressure on an installation is being checked, the reading rises.

Give TWO probable causes of this occurring.

- 1 _____
- 2 _____

(2 marks)

Total 9 marks

QUESTION 7

- (a) According to AS/NZS 5601, Part 2, state the type of space heater that is permitted to be installed in a boat.

(1 mark)

- (b) List FOUR potential causes of damage that hose assemblies must be protected from according to AS/NZS 5601 Part 2.

1 _____

2 _____

3 _____

4 _____

(2 marks)

- (c) According to AS/NZS 5601 Part 2, give the combined free vent area required for an LPG locker which houses a 12 kg cylinder.

(2 marks)

- (d) According to AS/NZS 5601 Part 2, give the definition of the term 'readily accessible'.

(1 mark)

Total 6 marks

QUESTION 8

(a) Give THREE common situations which could lead to spillage occurring in relation to a gas appliance.

1 _____

2 _____

3 _____

(3 marks)

(b) Describe the process by which condensation forms within a flue.

(3 marks)

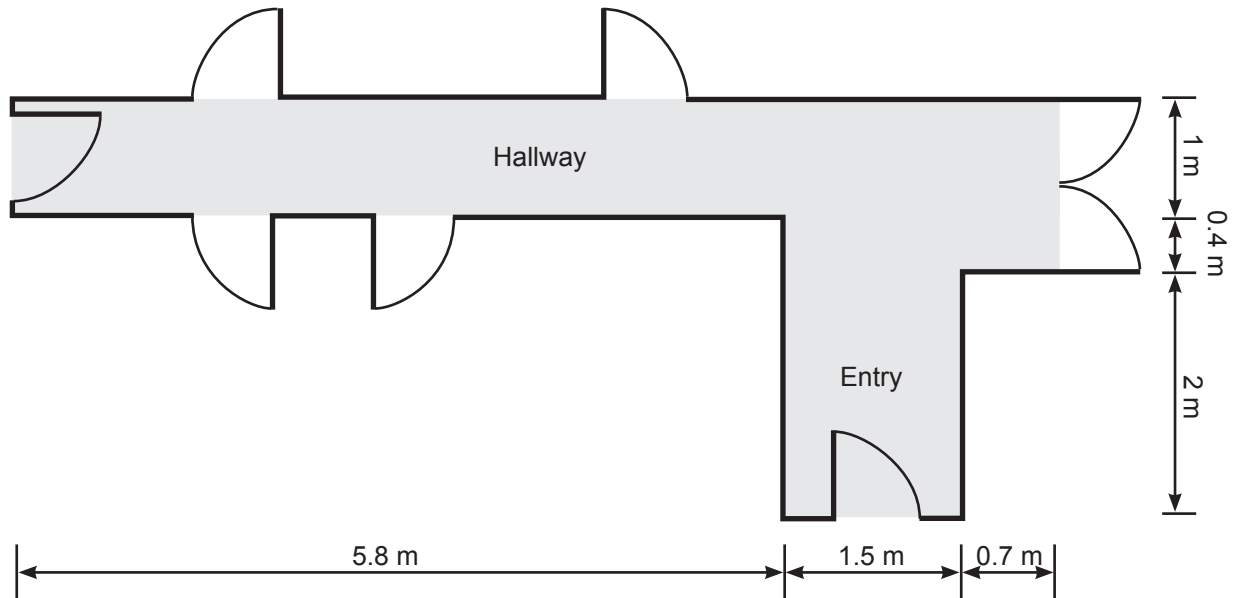
Total 6 marks

QUESTION 9

The plan below shows the hallway and entry of a house.

The hallway and entry are to be heated.

The ceiling height of the area is 2.7 m.



A flueless thermostatically controlled heater is to be installed.

Using AS/NZS 5601 Part 1, calculate the maximum permitted appliance input for the area.

Total 6 marks

QUESTION 10

Name THREE different types of regulators that may be found in a domestic gas installation, and for each type explain how it differs from other types of regulator.

(a) Name

Explanation

(2 marks)

(b) Name

Explanation

(2 marks)

(c) Name

Explanation

(2 marks)

Total 6 marks

QUESTION 11

(a) Give THREE site hazards that should be avoided when using an electrical extension lead on a building site.

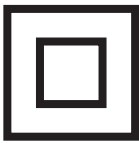
1 _____

2 _____

3 _____

(3 marks)

(b) State what the symbol below indicates in relation to power tools.



(1 mark)

Total 4 marks

QUESTION 12

A 200 mm diameter flue is to penetrate a corrugated galvanised steel roof.

Flashing in addition to a flexible boot flashing is required.

(a) Name the type of the additional flashing.

(1 mark)

(b) Name the New Zealand Building Code clause that provides an acceptable solution for this installation.

(1 mark)

Total 2 marks

QUESTION 13

(a) Sketch and label a diagram showing a solenoid valve and its components.

(3 marks)

(b) List the steps in the operational sequence of the solenoid valve in (a) when used to control the gas flow in an appliance.

(2 marks)

Total 5 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.

Should your choice of answer be unclear no mark will be awarded.

1. According to the Health and Safety in Employment Regulations, what term is used for work that is more dangerous than usual?

- A Danger work.
- B High risk work.
- C Notifiable work.
- D Restricted work.
- E Specialised work.

2. LPG is part of which family of gases?

- A 1st family.
- B 2nd family.
- C 3rd family.
- D 4th family.
- E 5th family.

3. What is the air to gas ratio for complete combustion of natural gas?

- A 10:1
- B 15:1
- C 20:1
- D 25:1
- E 50:1

4. What is the relative density of LPG?

A 0.50

B 0.65

C 0.95

D 1.25

E 1.55

5. Which of the following devices will shut off the gas supply in the event of mechanical ventilation failing to operate?

A Carbon monoxide detector.

B Fan interlock.

C Fire damper.

D Flame rectification device.

E Oxygen depletion device.

6. Which formula is used to calculate meter correction factor for pressure?

A $101.3 + (2.5 \div 101.3)$

B $(101.3 \times \text{burner pressure}) \div 101.3$

C $(101.3 + \text{supply pressure}) \div 101.3$

D $9.81 + (\text{atmospheric pressure} \div 101.3)$

E $(\text{Atmospheric pressure} + \text{heating value}) \div 101.3$

7. Which of the following is likely to cause an appliance regulator to make a chattering sound?

A The injectors of the appliance are blocked.

B The regulator is leaking.

C The regulator is not receiving enough pressure.

D The regulator breather hole has been enlarged.

E The regulator seat is jammed closed.

8. Which of the following is the vapourisation temperature for butane?

A -43°C

B -25°C

C -15°C

D -10°C

E 0°C

9. According to AS/NZS 5601 Part 1, what minimum clearance must there be between an open flue terminal and another flue terminal?

A 200 mm.

B 400 mm.

C 500 mm.

D 600 mm.

E 1000 mm.

10. According to AS/NZS 5601 Part 1, what is the maximum permitted gas consumption of an appliance where a twin wall flue is to be used in a cavity wall in a domestic location?

A 18 MJ/h.

B 24 MJ/h.

C 40 MJ/h.

D 50 MJ/h.

E 65 MJ/h.

11. According to the Gas (Safety and Measurement) Regulations, what does the abbreviation GSC stand for?

A Gas Supply Connection.

B Gas Safety Commission.

C Gas Service Company.

D Gas Specific Calibration.

E Gas Safety Certificate.

Total 11 marks

This page is available for additional working or answers

Question number _____

This page is available for additional working or answers

Question number _____

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For Examiner's use only

Question number	Marks	Marks
1		
2		
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Section B		
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