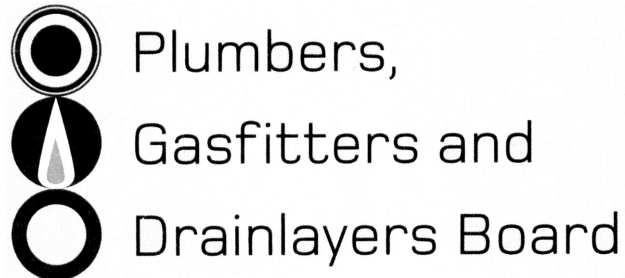


No. 9196



REGISTRATION EXAMINATION, JUNE 2020
CERTIFYING GASFITTER

ANSWER SCHEDULE

ANSWER 1

- (a) Any THREE (1 mark each)
- Dust (lint) present.
 - Flammable vapours present.
 - Appliance is installed in a confined space where alternative ventilation is not possible.
 - Ventilation or fans interfering with the combustion air.
 - Manufacturer's requirement.
- (3 marks)
- (b) (i) A hole or crack in the heat exchanger. (1 mark)
- (ii) Any TWO (1 mark each)
- Burners were incorrectly located heat exchanger was over heated.
 - Movement/expansion stresses.
 - Corrosion of the heat exchanger.

(2 marks)

Total 7 Marks

ANSWER 2

- (a) Any TWO (1 mark each)
- Excessive condensation.
 - Build-up of products of combustion or other toxic conditions.
 - Accumulation of gas from leakage.
- (1 mark)
- (b) $6 \times 2 \times 3.6 = 43.2 \text{ MJ}$ (1 mark)
 $(610 \times 43.2) = 26,352$ (1 mark)
 $(650 \times 5) = 3,250$ (1 mark)
 $26,352 + 3,250 = 29,602 \text{ mm}^2$ (1 mark) (4 marks)
- (c) Any TWO ($\frac{1}{2}$ mark each)
- Wind-actuated self-trimming cowls.
 - Rotary exhaustor heads.
 - Interlocked, fan assisted ventilation.
- (1 mark)

Total 6 Marks

ANSWER 3

(a) Any SIX (½ mark each)

- Shape of flue.
- Input rating of appliance.
- Length of the flue allowing for lateral runs.
- Material of construction – heat loss.
- Position – heat loss.
- Size of flue spigot on appliance.
- Any recommendations of appliance manufacturer.
- Termination point.

(3 marks)

(b) Any FOUR (½ mark each)

- Insulate flue.
- Protect flue from exposed area.
- Select shortest route to atmosphere.
- Avoid Offsets/ Avoid lateral runs.
- Increase flow with greater dilution.
- Selecting appropriate material for the flue.

(2 marks)

Total 5 Marks

ANSWER 4

(a) (i) Any TWO (1 mark each)

- Replacement of a gas appliance with an equivalent gas appliance, except in a caravan or boat with sleeping quarters, provided the work does not involve:
 - the repositioning of pipework or flue, or
 - a change in the installation pressure, gas type, ventilation, energy consumption, or operation of the installation.
- The maintenance of fittings and appliances other than repairs following a notifiable accident.
- The replacement of instrumentation and related controls, but only if the work does not result in the repositioning or disturbance of other pipework.
- The setting of safety devices, combustion conditions, and controls that are not designed to be adjusted by a consumer or gas refueller.
- Temporary gasfitting for experimental, testing, demonstration, teaching, or research purposes in a gas engineering workshop, manufacturing facility, gas test facility, laboratory, hospital, research project, or teaching institution. (2 marks)

- (ii)
- Addition or alteration to an existing installation.
 - Work not carried out in accordance with the means of compliance in the Installation Standard.
 - Work on an installation that includes gas pressure-raising equipment.
 - Repair work following a notifiable accident.
 - Work in domestic premises where the maximum operating pressure is more than 7 kPa for natural gas or more than 14 kPa for LPG.
 - Work in a building of more than three storeys which contains three or more separate dwellings.

- Work done to AS/NZS 5601 Part 1 where the supply pressure to the installation is greater than 200 kPa.
- Work done to AS/NZS 5601 Part 2 where the supply pressure to the installation is greater than 3 kPa.
- Work done within 20 metres of a hazardous area.
- Work done in a building in which air pressure is controlled by a mechanical ventilation system.
- Work done in a place where combustion air may be varied by mechanical means.
- Work done in a caravan or boat that contains sleeping accommodation. (2 marks)

(iii) • Gasfitting that is not categorised as low-risk or high-risk work. (1 mark)

(b)

Situation	Risk Category
Adding a gas hob to an existing installation in a house.	High
Installing a gas hob in a caravan with sleeping quarters.	High
Installing a gas hob in a new house.	General
Replacing a gas hob in a house with another one of the same model.	Low

(4 marks)

Total 9 Marks

ANSWER 5

(a) Any THREE (1 mark each)

- Leakage of gas within the installation is outside the tolerance of a soundness test or is in excess of one-fifth of the lower explosive limit.
- A pipe containing gas or intended to contain gas is not capped or securely closed to prevent leakage or flow of gas (except where ending in a burner or relief valve).
- The safety controls are inoperative or the safety controls fail.
- The flue associated with any gas appliance is incorrectly installed.
- Installed permanent ventilation required for safe operation has been closed off or is absent.

(3 marks)

(b) • The owner or occupier of the property where the danger exists.
• WorkSafe.

(2 marks)

(c) Any TWO (1 mark each)

- Details of the nature of the danger.
- How and why the gas installation or gas appliance presents an immediate danger to life or property.
- Any steps that have been taken, or that the person believes must be taken, to minimise or eliminate the danger.

(2 marks)

Total 7 Marks

ANSWER 6

- (a) • At very low temperatures butane will not evaporate and is left in the cylinder when the propane is drawn off. (2 mark)
- (b) • Change to propane enriched gas. (2 marks)
• Use a liquefied gas supply with a vaporiser.
- (c) Any TWO (1 mark each)
- The ambient temperature.
 - The size of the exposed surface area of the container.
 - The area of the container in contact with the confined liquid (wetted area).
- (2 marks)
Total 6 Marks

ANSWER 7

- (a) • Before the first tee (from the meter). (2 marks)
• Before the last tee (from the meter).
- (b) • To permit future extension or connection with non-compatible materials. (1 mark)
- (c) • BSPT (British Standard Pipe Thread) fitting between two multilayer/threaded adapters. (2 marks)
• Standard annealed copper tube between two multilayer/threaded adapters.
- (d) • A label must be attached adjacent to the meter or cylinders. (2 marks)
• The make or trade name must be shown.
- Total 7 Marks**

ANSWER 8

Pipe Section	Length (m)	Main run (m)	Gas flow (MJ/h)	Nominal size (mm)
A – B	4.5	16 m (½ mark)	401 (½ mark)	25 (1 mark)
B – C	2.3		120 (½ mark)	20 (1 mark)
B – D	3.7		281 (½ mark)	25 (1 mark)
D – E	4.4		23 (½ mark)	10 (1 mark)
D – F	2.2		258 (½ mark)	20 (1 mark)
F – G	4.5		220 (½ mark)	20 (1 mark)
F – H	5.6		38 (½ mark)	10 (1 mark)

Total 11 Marks

ANSWER 9

Any FOUR (1 mark each)

- Trainees/limited certificate holder.
- Person with exemption under supervision.
- Provisional licence holder.
- Tradesman.
- Journeyman.

Total 4 Marks

ANSWER 10

$$\text{Correction factor} = \frac{101.3 + 15}{101.3} = 1.148 \quad (1 \text{ mark})$$

$$5.2 \times 1.148 = 5.9696 \quad (1 \text{ mark})$$

$$5.9696 \times 95 = 567.11 \text{ MJ} \quad (2 \text{ marks})$$

Total 4 Marks

ANSWER 11

(a) Any EIGHT (½ mark each)

- Name and address of employer.
- Signature and name of the person completing the form.
- Job title of person completing the form.
- The location of the accident.
- The name, address and date of birth of the injured person.
- The role of the injured person –job title, employee, contractor, etc.
- Period of employment of injured person.
- Treatment of injury.
- Time and date of accident.
- Hours worked before accident occurred.
- Type of injury occurred.
- Equipment involved in accident, if any. (4 marks)

(b) • Worksafe. (1 mark)

(c) • 24 hours. (1 mark)

(d) Any FIVE (1 mark each)

- Nature of work.
- Address of worksite.
- Contractor details.
- Brief description of work.
- Due date of commencement.
- Estimated time to complete. (5 marks)

Total 11 Marks

ANSWER 12

Any SIX (1 mark each)

- The effect excavation may have on adjoining occupiers, adjacent structures.
- Affected footpath or road.
- The measures for controlling pedestrians and the safety of persons in the vicinity.
- Underground services such as electricity, drains or water reticulation.
- The nature of the soil to be excavated and its method of disposal.
- The length and nature of the haul route.
- The water table level, presence of standing or running water, possibility of flooding by surface runoff, and suitable means of disposing of discharged water.
- The time the trench is likely to be open.
- Reinstatement to original condition.

Total 6 Marks

ANSWER 13

- (a)
- To provide ventilation.
 - To provide a drainage path.
- (2 marks)
- (b) Any FOUR (½ mark each)
- Flue size.
 - Roof pitch.
 - Support.
 - Wind speed for area.
 - Distance to ridge or bottom of sheet above.
 - Material compatibility.
 - Roofing material profile.
- (2 marks)

Total 4 Marks

ANSWER 14

- (a) Room volume = $5.000 \times 3.200 \times 2.700 = 43.200 \text{ m}^3$ (1 mark)
Heat input = $43.200 \times 0.360 = 15.55 \text{ MJ/h.}$ (1 mark)
 $15.55 \text{ MJ/h} = 15.55 \div 3.6 = 4.32 \text{ kW}$ (1 mark) (3 marks)
- (b) Min room volume = $12 \div 0.4 = 30 \text{ m}^3$ (1 mark)
Min floor area = $30 \div 2.400 = 12.5 \text{ m}^2$ (1 mark) (2 marks)

Total 5 Marks

SECTION B

1. C 500 m
2. B 7 kPa
3. A A custom designed method that is not included in the Building Code but that will fulfil the requirements of the code.
4. B 80% of the length of the flexible hose.
5. C 2.0 m.
6. E 2.0 m.
7. E 6
8. D 1200 mm.
9. A Because of the corrosive nature of condensate.

Total 9 Marks