No. 9196

Plumbers, Gasfitters and Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2019

CERTIFYING GASFITTER

ANSWER SCHEDULE

ANSWER 1

(a) (i) 25,000 BTU × 0.001055 = 26.375 MJ/h (1 mark)
From AS/NZS 5601: 610 × 26.375 = 16,088.75 (1 mark)
From AS/NZS 5601: 650 × 3 = 1950 (1 mark)
Ventilation opening area = 16,088.75 + 1950 = 18,038.75 mm^2 (1 mark)
(4 marks)

(ii) Ventilation opening height = 18,038.75 ÷ 200 = 90.4 mm (1 mark)

(b) (i) Any TWO (1 mark each)
- Behind the appliance
- Vented to outside
- One above the absorption fins
- One at low level

(2 marks)

(ii) 32,500 mm^2 free ventilation area (1 mark)

Total 8 Marks

ANSWER 2

(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)

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

- 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) • General gasfitting is gasfitting that is not categorised as low-risk or high-risk work.

(1 mark)

(b) (i) • Certifying Gasfitter (1 mark)

(ii) Any SIX (1 mark each)

- That the work has been done lawfully and safely, and the information on the certificate is correct.
- That the work has been done in accordance with means of compliance in AS/NZS 5601 Part 1 or 2.
- Whether the work has been done in accordance with the certified design for the gas installation.
- Which other Standards were complied with (if this was required).
- Whether the work done relied on any manufacturer's instructions.
- The type of gas the installation is safe to connect to.
- The gas pressure that the installation is safe to connect to.
- Which parts of the installation, if any, are safe to connect to a gas supply.
- The location of the gas installation.
- Describe the work done and who did what, if different work was done by different people.
- The name and registration number of the person issuing the certificate.
- The name and registration number of any other person who did any of the gasfitting work under supervision.
- The date(s) on which the work was done.
- Be signed and dated by the person issuing the certificate.
- Display the Authentication Mark.
- Include a copy or reference to the manufacturer's instructions and certified design used for the work. This may be a reference to where the documents can be found by electronic means (e.g. a website).

(6 marks)

(b) (iii)
- Gas Safety Certificate (GSC).
- Entry into the High Risk Data Base.

(2 marks)

Total 14 Marks

ANSWER 3

(a) Correction factor = $\frac{101.3 + 9}{101.3}$ = 1.088 (1 mark)

12.45 × 1.088 = 13.55 (1 mark)

13.55 × 40 = 542 MJ (2 marks)

(4 marks)

(b) 542 × 80% = 433.6 (1 mark)

(c) 12.45 × 10 = 124.5 m^3/h (of air) (1 mark)

124.5 × 20% = 24.9 m^3 (1 mark)

(2 marks)

Total 7 Marks

ANSWER 4

(a)

Description of work	Notifiable Work Y/N
A trench which is 2 metres deep and 1.5 metres wide at the top	Yes
Working in a confined space	No
Working on a scaffold where the handrail is 5 metres high	Yes
Working on a residential property which is known to contain asbestos containing materials	No
Work in which a person wears a face mask with filter canisters	No
Working in an area where the temperature exceeds 45ºC	No

(6 marks)

(b) Any THREE (1 mark eaach)
- Not intended for human occupation but is large enough for a worker to enter and perform assigned work.
- Has limited entries and exits.
- May contain a hazardous atmosphere, arising from chemicals, sludge or sewage;
- Is constructed so that anyone who enters could be asphyxiated or trapped by walls or floor that converge to a small cross-section, such as a hopper;
- Contains a material, such as sawdust or grain that could engulf anyone who enters.

(3 marks)

Total 9 Marks

ANSWER 5

(a) EITHER

Using tables

6 m × 1.14 = 6.84 (1 mark)

2 m × 0.79 = 1.58 (1 mark)

7.7 m × 0.50 = 3.85 (1 mark)

Total = 6.84 + 1.58 + 3.85 = 12.27 litres (1 mark)

OR

By calculation

$\pi \times 0.02^2 \times 6 = 0.00754\ m^3$ (1 mark)

$\pi \times 0.016^2 \times 2 = 0.00161\ m^3$ (1 mark)

$\pi \times 0.0125^2 \times 7.7 = 0.00378\ m^3$ (1 mark)

$= 0.01293\ m^3 = 12.93$ litres (1 mark) (4 marks)

(b) 0.35 kPa (1 mark)

Total 5 Marks

ANSWER 6

(a) Any THREE (1 mark each)

- Excavation and Shafts for Foundations.
- Hazardous Substances.
- Noise in the Workplace.
- Operator protective structures on self-propelled mobile mechanical plant.
- Installation and maintenance of LPG multi-cylinder systems.
- Installation and maintenance of twin 45 kg LPG cylinder systems.
- Code of Practice for LPGA Compliance 100 kg to 300 kg.
- Guide for Safety with Underground Services. (3 marks)

(b) To give preferred work practice or arrangements. (1 mark)

(c) Observance of a relevant code of practice may be considered as evidence of good practice in a court.

(1 mark)

Total 5 Marks

ANSWER 7

(a) Any four (1 mark each)

- A substance escaping.
- Gas or steam escaping.
- An implosion, explosion or fire.
- The collapse of a structure.
- The collapse or failure of an excavation.
- Electric shock.
- The fall or release from height of anything.
- Other incidents outlined in other regulations. (4 marks)

(b) Any TWO (1 mark each)

- Preserve the site.
- Notify WorkSafe.
- Keep records. (2 marks)

(c)
- Notifiable illness or injury.
- Death. (2 marks)

Total 8 Marks

ANSWER 8

(a)

Pipe Section	Number of clips
A - B	3
B - C	2
C - D	3
B - E	13
E - F	3
F - G	6

(6 marks)

(b)
- Prefabricated clips of either the same material as or of a material compatible with, the pipe.
- Fastened with nuts and bolts, rivetts or screws. (2 marks)

Total 8 Marks

ANSWER 9

EITHER

Using tables:

Main/longest run	15.5 m (1 mark)

Pipe Section	Length (meters)	Gas flow (MJ/h)	Nominal size (mm)
A - B	7.5	234 (1 mark)	20 (1 mark)
B - C	5	43.2 (1 mark)	15 (1 mark)
B - D	2	190.8 (1 mark)	20 (1 mark)
D - E	2.5	162 (1 mark)	20 (1 mark)
D - F	6	28.8 (1 mark)	10 (1 mark)

OR

Using graphs:

Pipe Section	Length (meters)	Gas flow (MJ/h)	Nominal size (mm)
A - B			
B - C			
B - D			
D - E			
D - F			

Total 11 Marks

ANSWER 10

(a) Any FOUR (1 mark each)

- Blocked flue.
- Lack of ventilation.
- Too many bends.
- Disturbed air at cowl.
- Flue too small.
- Increased gas pressure.
- Cracked heat exchanger. (4 marks)

(b) Any FOUR (1 mark each)

- The flue is blocked causing incomplete combustion.
- The aeration for the burner could be blocked with lint.
- The mixing tube could be blocked.
- The burner ports could have enlarged or corroded.
- The gas pressure may be incorrect.
- The radiant may be incorrectly positioned. (4 marks)

(c)
- Excessive heat loss reduces the motive force of the flue products.
- Causes condensation. (2 marks)

Total 10 Marks

ANSWER 11

(a)
- To stop the spread of fire and smoke from one fire cell to another. (2 marks)

(b)
- In the event of a fire the fire collar expands crushing the pipe sealing the penetration.

(2 marks)

Total 4 Marks

SECTION B

1. A 10 m^3
2. A When the size of the roof penetration is greater than 85 mm diameter.
3. B 6 months.
4. D QCC.
5. E Appliances with atmospheric burners joined to the same flue as appliances with forced draught burners.
6. C 3 kPA.
7. A 7 kPA.
8. A 19 mm.
9. C 19 mm.
10. A 20 litres/second.
11. E Energy Safety.

Total 11 Marks