No. 9196

Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, NOVEMBER 2018

CERTIFYING GASFITTER

ANSWER SCHEDULE

ANSWER 1

(a) (i) The water comes from the flue gases cooling while in the flue and condensing into water, running down the baffle to drip on the burner.

(2 marks)

(ii) It occurs more when the water heater is cold because the cold sides of the tank cool the flue gases faster than normal.

(2 marks)

(b) Any FIVE (1 mark each)

- Insulation of hot water pipework.
- Location of appliance relative to hot water usage.
- Capacity of heater compared with water demand.
- Pattern of hot water usage.
- Maintenance and servicing of appliance.
- Fluctuating gas supply. (5 marks)

Total 9 Marks

ANSWER 2

(a) Any THREE (1 mark each)

- Appliance has reached equilibrium or steady state operation.
- Burner is operating at full fire.
- Readings are taken in the centre of the flow of products of combustion.
- Measurements are taken as close as possible to the appliance. (3 marks)

(b) Any THREE (1 mark each)

- Flue gas temperature.
- Carbon dioxide to air ratio.
- Oxygen percentage.
- Carbon monoxide reading (3 marks)

Total 6 Marks

ANSWER 3

(a) 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) Any TWO (1 mark each)

- Complete a Gas Safety Certificate (GSC).
- Instruct the owner.
- Lodge an entry into the high risk database (if required). (2 marks)

(c)

Situation	Category
Installing a new gas hob in a new house.	General
Replacing a gas hob by another one of the same model.	Low
Adding a gas hob to an existing installation in a house.	High
Replacing a gas valve on a gas hob.	Low

(4 marks)

Total 12 Marks

ANSWER 4

Appliance	Daily operating time	Daily gas consumption (m^3)
LPG space heater 24,000 BTU/h	11 hours	3.09
Natural gas water heater 220 MJ/h	4 hours	22
LPG gas furnace 38 kW/h	15 hours	22.8
Natural gas commercial cooker 104 MJ/h	8 hours	20.8

Total 8 Marks

ANSWER 5

(a)
- Cross at an angle of not less than 45º.
- Have the required vertical separation. (2 marks)

(b)
- Within the middle third of the joist.
- Diameter not exceeding 20% the depth or 32 mm whichever is less (32 mm).
- Not more than three times the depth of joist from joist support (600 mm). (3 marks)

Total 5 Marks

ANSWER 6

Pipe Section	Length (m)	Main run (m)	Gas flow (MJ/h)	Nominal size
A - B	1.5	11.8 m (½ mark)	578 (½ mark)	25 (1 mark)
B – C	6		70 (½ mark)	15 (1 mark)
B – D	2.5		508 (½ mark)	25 (1 mark)
D – E	3		223 (½ mark)	20 (1 mark)
E – F	2.4		35 (½ mark)	10 (1 mark)
E – G	2.5		188 (½ mark)	20 (1 mark)
D – H	3.2		285 (½ mark)	20 (1 mark)
H – I	4		190 (½ mark)	20 (1 mark)
H – J	4.6		95 (½ mark)	15 (1 mark)

Total 14 Marks

ANSWER 7

(a)
- Test points at each appliance (to set operating pressure) and test-point after the supply regulator (to test/check operating pressures). (1 mark)
- Isolating valves at the water heater and ducted heater only. (2 marks)

(b) Any FOUR (1 mark each)
- 9 kg maximum.
- Approved cylinder connection.
- Cylinder compartment ventilated directly to outside.
- Hose 1 m maximum with no jubilee clips.
- No electrical appliance or source in the cylinder compartment. (4 marks)

Total 7 Marks

ANSWER 8

Pipe Section	Number of clips	Rod hanger size
A – B 150 mm diameter pipe	11 (1 mark)	20 (½ mark)
B – C 50 mm diameter pipe	6 (1 mark)	10 (½ mark)
B – D 65 mm diameter pipe	4 (1 mark)	12 (½ mark)
D – E 40 mm diameter pipe	8 (1 mark)	10 (½ mark)
D – F 32 mm diameter pipe	5 (1 mark)	10 (½ mark)
F – G 25 mm diameter pipe	10 (1 mark)	10 (½ mark)

Total 9 Marks

ANSWER 9

(a) Any TWO (1 mark each)
- Fire collars.
- Fire walls.
- Fire doors.
- Intumescent material.
- Other forms of fire rated sealant etc. (2 marks)

(b) Drawing to show:
- Fire band located correctly. (1 mark)
- Wraps in suitable positions. (1 mark)
- One wrap on each side of the penetration. (1 mark)
- Fire band fixed in place. (1 mark) (4 marks)

(c)
- Expands when exposed to heat and crushes plastic pipes keeping penetrations of fire separations well sealed.

(1 mark)

Total 7 Marks

ANSWER 10

(a) Vol of 40 mm pipe = 13.5 m × 1.14 = 15.39 m^3
Vol of 32 m pipe = 6.5 m × 0.79 = 5.135 m^3
Vol of 25 m pipe = 1.5 m × 0.50 = 0.75 m^3
Total = 21.275 litres (4 marks)

(b) • 0.20 kPa (1 mark)

Total 5 Marks

ANSWER 11

(a) (i) • Group controls protect multiple people from falling. Personal controls only look after individuals.

(1 mark)

(ii) Any ONE (1 mark)
- Edge protection.
- Scaffold.
- Elevating work platforms.
- Safety mesh. (1 mark)

(iii) Any ONE
- Fall restraint harness.
- Fall arrest harness. (1 mark)

(b) • 5 m. (1 mark)

(c) • The handrail height. (1 mark)

Total 5 Marks

ANSWER 12

(a) • WorkSafe. (1 mark)

(b) • 24 hours. (1 mark)

(c)
- If it is necessary to deal with an emergency (e.g. arising from damage caused by any earthquake, explosion, fire, flood, lightning, rain, slip, storm, or washout).
- The blockage or breakdown of any drain or sewer.
- The blockage or breakdown of any distribution system or network (for electricity, gas, telecommunications, or water). (1 mark)

Total 3 Marks

SECTION B

1. B 1.2 m.
2. D 2.0 kPa.
3. B 12 months.
4. A 3.5 kPa.
5. C 20 mm per m.
6. C 0.4 MJ/h/m^3.
7. D 6 mm.
8. D The allowance for a gas taking up less volume while under pressure.
9. A 0.3 m^3.
10. C 10 m^2.

Total 10 Marks