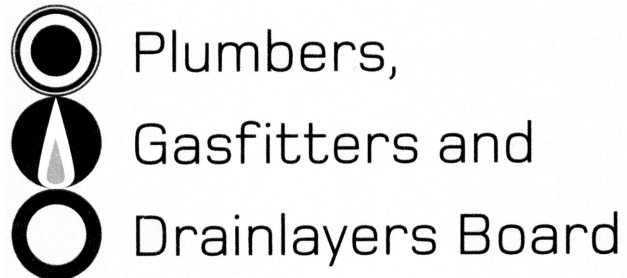


No. 9193



REGISTRATION EXAMINATION, NOVEMBER 2011
LICENSED GASFITTER

ANSWER SCHEDULE

ANSWER 1

Any FOUR (1 mark each)

- Filter.
- Insulator.
- Over pressure shut off.
- Over pressure relief.
- Connection union.
- Test point.

Total 4 marks

ANSWER 2

- (a) (i) 7 kPa (1 mark)
- (ii) 3 kPa (1 mark)
- (iii) 3 kPa (1 mark)
- (b) 7.5 kPa (1 mark)

Total 4 marks

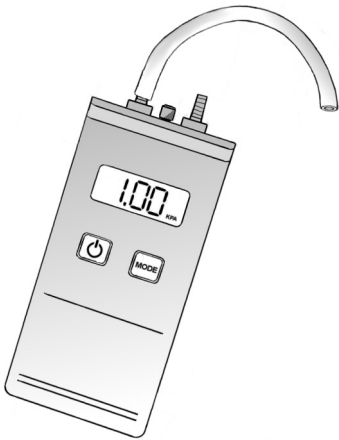
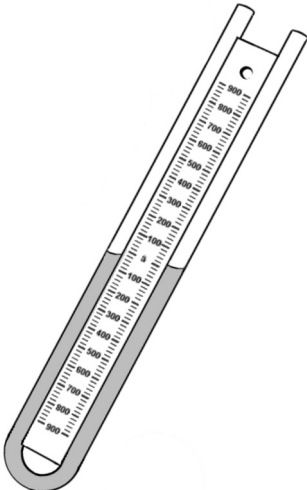
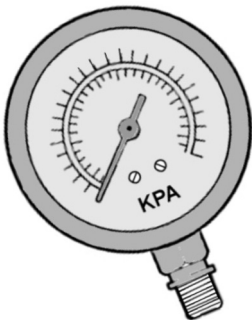
ANSWER 3

- (a) Drawing to include (½ mark each)
- Electrical connections
 - Magnetic coil
 - Plunger
 - Spring
 - Valve
 - Seat
- 1 mark if not functional (3 marks)
- (b) Power energises the coil creating a magnetic field which attracts the plunger and lifts it off of the valve seat allowing gas to flow. Once power stops the spring pushes the plunger against the valve seat stopping gas flow.

(2 marks)

Total 5 marks

ANSWER 4

	<p>Name: Digital manometer</p> <p>An advantage of this gauge (Any ONE):</p> <ul style="list-style-type: none"> • Small Size • Accuracy • Can test higher pressures • Various units • Easy to read <p>A disadvantage of this gauge (Any ONE):</p> <ul style="list-style-type: none"> • Cost • Fragile • Needs calibration • Reliant on batteries
	<p>Name: Water gauge / U gauge</p> <p>An advantage of this gauge (Any ONE):</p> <ul style="list-style-type: none"> • Reliable • Robust • Doesn't need calibration <p>A disadvantage of this gauge (Any ONE):</p> <ul style="list-style-type: none"> • Large size • Water can spill • Only reads low pressures • More difficult to read • Limited precision
	<p>Name: Bourdon gauge</p> <p>An advantage of this gauge (Any ONE):</p> <ul style="list-style-type: none"> • Can be used for a range of pressures • Small • Robust • Easy to read • Installed in place <p>A disadvantage of this gauge (Any ONE):</p> <ul style="list-style-type: none"> • Needs calibration • Mechanical prone to failure • Must be threaded into pipework

(1 mark each name, 1 mark each advantage, 1 mark each disadvantage)

Total 9 marks

ANSWER 5

(a) ½ mark each step

- Turn heater on/ allow it to heat up.
- Light a smoke stick/rag or similar.
- Hold near the down draught diverter.
- Check smoke flows up flue not into room.

(2 marks)

(b) ½ mark each step

- Turn heater on/ allow it to heat up.
- Hold a mirror or other shiny cold surface near the front/top of the appliance.
- Look for condensation to form on the mirror.
- This indicates products of combustion spilling into the room.

(2 marks)

Total 4 marks

ANSWER 6

½ mark each

- Flue clearances.
- Egress and mechanical damage.
- Location of services (power, water, gas).
- Structure for mounting strength.
- Air quality around the appliance/environment.
- Clearance to flammable environments.

Total 3 marks

ANSWER 7

A	Pressure relief	G	First stage regulator
B	Shut-off valve	H	Drip leg
C	POL/left hand thread/cylinder connection	I	Drain / test point
D	Pigtails	J	Second stage regulator
E	Change over valve	K	Relief vent
F	Indicator	L	Outlet

Total 6 marks

ANSWER 8

(a) Any THREE (1 mark each)

- Thermocouple burnt out. Pilot flame too hot.
- Positioned incorrectly in the flame. Not hot enough.
- Dirty pilot flame too small.
- Faulty thermocouple assembly.
- Thermocouple not connected to valve correctly.

(3 marks)

(b) Any THREE (1 mark each)

- Lack of gas supply/blocked burner.
- Sensor positioned incorrectly in the flame.
- Sensor has decayed or is dirty.
- Loose electrical connections.
- Faulty PCB (control board).

(2 marks)

Total 5 marks

ANSWER 9

(a) Soaker flashing

(1 mark)

(b) E2 External Moisture

(1 mark)

Total 2 marks

ANSWER 10

- (a)
- Protect the hose from damage when pulling the cooker out.
 - Stop the cooker from tipping forward.

(1 mark each, 2 marks)

- (b)
- To facilitate maintenance.
 - To separate buildings.
 - To separate occupancies within a building.
 - To separate floors in multi-storied non-residential buildings.

(½ mark each, 2 marks)

Total 4 marks

ANSWER 11

(a) At least 500 mm above the neighbouring structure.

(1 mark)

(b) At least 1000 mm.

(1 mark)

(c) When appliance installation instructions deem it to be suitable.

(1 mark)

Total 3 marks

ANSWER 12

The appliance may lack required combustion air and the flue draught may be stalled possibly drawing flue gases back into the area.

Total 1 mark

ANSWER 13

Area = 9.02 m² (2 marks)

Vol = 21.648 m³ (1 mark)

Input = 21.648 × 0.4 MJ/h = 8.4 MJ/h (1 mark)

Total 4 marks

ANSWER 14

Any FOUR (1 mark each)

- Working loose.
- Abrasion.
- Work hardening.
- Corrosion.
- Mechanical damage.

Total 4 marks

ANSWER 15

A	Flue	E	Room circulation fan
B	Burner	F	Heat exchanger
C	Combustion fan	G	Condensate drain
D	Return air / Air in	H	Flow / Air out

(½ mark each, 4 marks)

Total 4 marks

ANSWER 16

- (a) A vaporiser heats liquid fuel causing it to change to a vapour at a much faster rate than it could naturally.

(1 mark)

- (b) A vaporiser may be required where large quantities of gas are required or low temperatures hinder natural vaporisation of fuel.

(1 mark)

Total 2 marks

ANSWER 17

Any TWO (½ mark each)

- Carbon dioxide.
- Nitrous oxide.
- (Water vapour.)

Total 1 mark

ANSWER 18

$$10.2 \times 3.6 = 36.72 \text{ MJ/h}$$

(1 mark)

$$36.72 \div 40 \text{ MJ/m}^3 = 0.918 \text{ m}^3/\text{h}$$

(1 mark)

Total 2 marks

ANSWER 19

- (a) Moisture is trapped in the air when it touches the cool surface of the window the drop in temperature (dew point) causes the water vapour to change state and appear as water.

(2 marks)

- (b) The products of combustion include significant quantities of water vapour which increases the moisture content of the air.

(1 mark)

Total 3 marks

ANSWER 20

- (a)
- Thermostat phial incorrectly positioned.
 - Thermostat phial is coated in dust/lint.
 - Capillary or other component has leaked out the liquid of the thermostat.

(1 mark each, 3 marks)

- (b) Any FOUR (½ mark each)

- Fuses.
- Flame Failure.
- Tip Over switch.
- Overheat cut out.
- ODS oxygen depletion system.

(2 marks)

- (c) If the flame failure device were to cease working it will stop gas flow.

(1 mark)

Total 6 marks

ANSWER 21

- A Phial/ bulb.
- B Capillary tube.
- C Bellows.

Total 2 marks

SECTION B

1. C 3rd Family.
2. D 5% - 15%.
3. E 1.55
4. A Ethane and methane.
5. C NZS 5261 Part 1.
6. E 750 mm.
7. D 90% the length of the hose assembly.
8. B 0.9 m.
9. A A blockage in the lint trap.
10. D Particles scouring action on the internal bore of the pipe.
11. C The combustion portion of the heater is room sealed.
12. A 150 mm.
13. E Fan interlock.
14. D Have at least 1 m of unlagged metallic pipe connected to the heater.
15. D 1000 mm.
16. B The bottom of the wok is impinging on the burner flame.
17. A The contamination of air supply to a burner by products of combustion.
18. E The regulator diaphragm has ruptured.
19. B The fumes of the chemicals can damage the heater if passing through the burner.
20. C $\text{Appliance heat output} \div \text{heat input}$.

Total 20 marks

