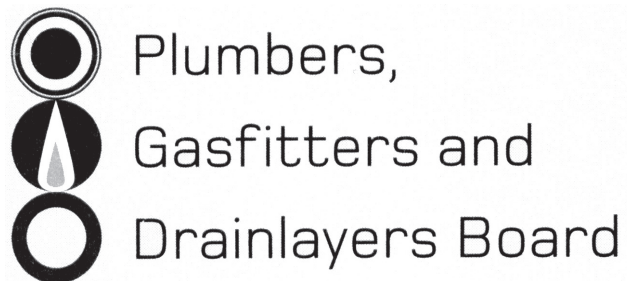


No. 9193



REGISTRATION EXAMINATION, NOVEMBER 2010
LICENSED GASFITTER

ANSWER SCHEDULE

ANSWER 1

- (a) To stop the flow of gas in the event of too much gas flow through the system. (2 marks)
- (b) It is a normally open valve which closes automatically when a predetermined flow rate in a particular direction is exceeded (1 mark)
- (c) A flexible hose bursting on an LPG cylinder pigtail (or an example marked on their own merit). (1 mark)
- Total 4 marks**

ANSWER 2

- (a) Ministry of Economic Development. (1 mark)
- (b) Either Energy Safety or ES (1 mark)
- Total 2 marks**

ANSWER 3

Any FOUR (½ mark each)

Thermo Electric Flame Failure Device (TEFFD)
Flame Rectification
Mercury Vapour Valve/Liquid expansion
Ultra Violet Photo Sensitive Cell
Infra-red sensing

Total 2 marks

ANSWER 4

Any TEN (½ mark each)

- Remove covers or panels from the gas appliance.
- Clean out the gas appliance air intakes (primary air ports) and ventilation openings of dust, spiders webs, etc.
- Remove the burner (if possible) and clean out ports, check for corrosion.
- Refit the burner.
- Visually check wires and electrical connections.
- Visually check for signs of scorching.
- Check the ignitor for positioning, security, wear and rust.
- Check operation of controls for sticking, damage and wear.
- Ensure the draught diverter is clear of obstructions, and check flue for draught using smoke while gas appliance is still cold.
- Check the location of flue terminal, to ensure that it has not been affected by building activity or vegetation growth since installation.
- Check the gas appliance position in relation to combustible materials or room type to ensure that safety has not been affected by building alterations or redecoration since installation.
- Check the room size and ventilation requirements against 2.5.7.
- Ensure the room or enclosure is not used to store flammable goods or chemicals, as fumes could be drawn in with combustion air and create toxic or corrosive chemicals.
- Locate the data plate and ensure that the gas appliance is suitable for its situation, and is correct for the stipulated gas type.
- Recommission the appliance in accordance with the manufacturer's relevant instructions or, in the absence of instructions, Appendix H Guidelines for Gas Appliance Commissioning, of this Standard.
- Check operation of the water valves.
- Check that the temperature/pressure relief valve or pressure relief valve is not dripping, or the open vent is not overflowing.
- Check operation of the thermostat.
- Soundness test.

Total 5 marks

ANSWER 5

Any FOUR (1 mark each)

- Check power supply to appliance is working.
- Check controllers are turned on. (if fitted).
- Check gas valves is on.
- Remove check and clean the water filter.
- Check if any error codes are displayed.
- Consult the service manual or manufacturer.
- Check the incoming gas pressure.
- Check for adequate water pressure.

Total 4 marks

ANSWER 6

ATMOSPHERIC BURNER.

A system where all the air for combustion is introduced by the inspirating effect of the gas or the natural draught in the combustion chamber or a combination of the two without mechanical assistance.

(1 mark)

FORCED DRAUGHT BURNER.

A system where all or part of the air for combustion is introduced by providing positive pressure in the combustion chamber by mechanical means.

(1 mark)

INDUCED DRAUGHT BURNER.

A system where all or part of the air for combustion is introduced by providing suction in the combustion chamber by mechanical means.

(1 mark)

Total 3 marks

ANSWER 7

- (a) To dampen/soften the movement of the diaphragm to make a smoother flow of gas as supply and demand changes.

(2 marks)

- (b) (i) Blocked hole stops the diaphragm from moving.

(1 mark)

- (ii) Enlarged hole will allow the diaphragm to move too quickly causing valve to open and close fast causing valve chatter (buzzing sound).

(1 mark)

Total 4 marks

ANSWER 8

BALANCED FLUE.

A flue system in which the combustion products are discharged at the same height and atmospheric pressure as the combustion air inlet of a room sealed appliance.

(1 mark)

COMMON FLUE.

A flue system designed to carry combustion products from two or more appliances.

(1 mark)

NATURAL DRAUGHT FLUE.

A flue in which the draught is provided by the buoyancy effect of the hot gases in it.

(1 mark)

OPEN FLUE.

A flue system containing a draught diverter or canopy.

(1 mark)

POWER FLUE.

A flue system in which combustion products are removed from the gas appliance by a fan in the flue.

(1 mark)

ROOM-SEALED GAS APPLIANCE.

A gas appliance designed so that air for combustion does not enter from, or combustion products enter into, the room in which the gas appliance is located.

(1 mark)

PORTABLE GAS APPLIANCE.

A gas appliance designed to be carried by the user from place to place, as required.

(1 mark)

MOBILE GAS APPLIANCE.

A gas appliance fitted with wheels which is designed to be easily moved by one person.

(1 mark)

Total 8 marks

ANSWER 9

THERMOSTAT TYPE	DESCRIPTION OF HOW THE THERMOSTAT FUNCTIONS	APPLIANCE COMMONLY USED IN
Thermistor	2 marks ½ mark each: A temperature dependant resistor. As the <u>temperature</u> increases the <u>resistance</u> in the Thermistor likewise increases. Therefore any <u>current</u> passed through the Thermistor will indicate the temperature through use of a <u>PCB, CPU or Electronic Control Board</u> .	½ mark <u>Electronic</u> Controlled ½ mark for: Any gas-fired appliance.
Liquid expansion (vapour filled)	2 marks ½ mark each: Vapour or liquid is in a <u>bulb, probe or phial</u> , when heated the vapour <u>expands</u> increasing the pressure within the phial and down a small <u>capillary tube</u> to expand a <u>bellows</u> pushing open a gas valve.	1 mark for any: Cooker, Space Heater, Deep Fryer
Coil	2 marks ½ mark each: A strip of metal often in a <u>coil or spring</u> shape is made of two <u>dissimilar metals</u> which expand at different rates. When the bi-metallic coil is warmed it will <u>twist or bend</u> operating a mercury operated or electrical <u>switch</u> . On/Off operating.	1 mark for any: Warm Air Furnaces, Space Heaters,
Rod and tube	2 marks ½ mark each: A <u>steel rod</u> is fixed at one end inside a <u>copper or brass tube</u> . The copper tube expands as it warms growing longer. The steel rod <u>does not expand at the same rate</u> as the copper tube and as it is <u>fixed at one end</u> to the copper it moves up and down the tube as the temperature changes. The rod was holding a valve open and when it moves away it allows the valve to close.	1 mark for any: Storage Water Heaters, Very old cookers

Total 12 marks

ANSWER 10

- A Cowl /Terminal (½ mark)
- B Support bracket (½ mark)
- C Ceiling plate (½ mark)
- D Secondary flue or inner flue (½ mark)
- E Disconnection sleeve (½ mark)
- F Down draft diverter (½ mark)
- G Primary flue or heat exchanger (½ mark)
- H Baffle (½ mark)
- I Combustion Chamber (½ mark)
- J Burner (½ mark)

Total 5 marks

ANSWER 11

Any FOUR (1 mark each)

- Lack of oxygen through a lack of, or having undersized, ventilation.
- Flame chilling resulting from draught, flame lift off or under aeration.
- Blocked, partially blocked, undersized or incorrect installation of the flue.
- Vitiating.
- Lightback.
- Blocked burner.

Total 4 marks

ANSWER 12

(a) The maximum lateral (horizontal) run is 50% of the vertical height of the flue. (2 marks)

(b) 2 m. (1 mark)

Total 3 marks

ANSWER 13

Any FOUR (1 mark each)

- Inadequate pipe sizing.
- Blockage in pipework due to dust (corrosion), water, or other material.
- Addition of a high consumption appliance increasing demand without re-sizing the pipework.
- Fault at point of supply (meter, supply regulator, cylinder empty).
- Fault upstream of point of supply – service capacity or cylinder size/evaporation.
- An over-rated gas appliance.

Total 4 marks

ANSWER 14

(a) Any TWO (1 mark each)

- Centrally located
- Hallway
- Away from people/toilets
- Low level

(2 marks)

(b) Any FOUR (½ mark each)

- Draw the air back from the outlets evenly
- Draw cooler air from the floor level
- Less noise disturbance for occupants
- Less draft disturbance
- Efficient use of warmth
- Prevent circulation of smells

(2 marks)

Total 4 marks

ANSWER 15

Vol of gas = $45 \div 95 = 0.47 \text{ m}^3$ (1 mark)

Vol of air = $0.47 \times 25 = 11.75 \text{ m}^3$ (1 mark)

Vol of oxygen = 20% of 11.75 = 2.35 m³ (1 mark)

Total 3 marks

ANSWER 16

Any SIX (1 mark each)

- Mixing tube
- Injector
- Gas inlet
- Primary aeration
- Flame retention
- Aeration adjustment
- Flame retention
- Inner zone
- Intermediate zone
- Outer zone

Total 6 marks

ANSWER 17

• Isolate sections of the installation (1 mark)

• Soapy water OR bubble liquid OR electronic test (1 mark)

Total 2 marks

ANSWER 18

• Turn the appliance off (½ mark)

• Remove the pressure test point (½ mark)

• Attach an appropriate pressure gauge (½ mark)

• Relight the appliance and set to run at full (½ mark)

• Take the reading (½ mark)

• Turn the appliance off (½ mark)

• Remove the gauge and refit test point (½ mark)

• Soap Test for leaks where necessary (½ mark)

Total 4 marks

SECTION B

1. D Gas Measurement System.
2. B WARNING. Provide ventilation when cooker is in use. Do not use for space heating.
3. D It must have a minimum character height of 4 mm.
4. B 100 kilograms.
5. A Storage and Handling of LP Gas.
6. B Gas Appliance Safety.
7. E Between 20 and 35 mV.
8. A 15 kg maximum each cylinder.
9. A At 10% of the LEL.
10. B At low level above the floor.
11. E For a fixed amount of gas kept at a fixed temperature, pressure and volume are inversely proportional.
12. B At constant pressure the volume of a gas increases or decreases by the same factor as its temperature increases or decreases.
13. D There is the possibility to interchange between the gases without the need to change the injector size.
14. C Condensation.
15. A $(101.3 + \text{supply pressure}) \div 101.3$
16. A On the rear wall of the motor home.
17. A Burner injector sizes.
18. A Appliances that are likely to discharge a combustible mixture.
19. C Energy Cut Out.
20. B An electrical current is partially rectified as it passes through a flame, then travels back to the control board.
21. B 5%

