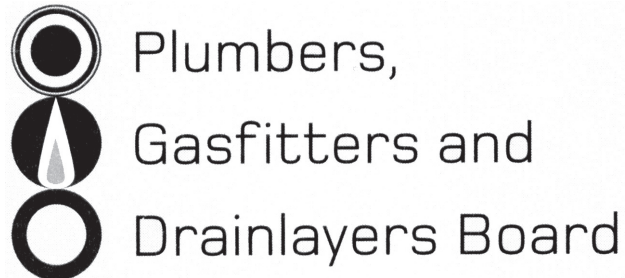


No. 9193



REGISTRATION EXAMINATION, JUNE 2016
LICENSED GASFITTER

ANSWER SCHEDULE

ANSWER 1

Part	Name	Purpose
A	Slip Ring	A disconnection point so the flue can be disconnected from the appliance without applying excessive stress to the flue.
B	Down Draught Diverter	To stop down draught from entering the appliance and allow air to enter the flue system to aid with flue momentum
C	Heat exchanger/ Primary flue	To allow heat to be conducted between the hot flue gases and the water jacket.
D	Flue Baffle	To slow down the flue gases to achieve the greatest heat transmission possible before allowing the gases to pass up the flue.
E	Combustion Chamber	To contain the combustion process and direct the products of combustion into the primary flue
F	Burner access opening	To allow access to the burner and allow air for combustion to enter the combustion chamber.

Total 12 marks

ANSWER 2

- (a) Any FOUR (1 mark each)
- Leakage/installation test.
 - Soapy water leak check of any affected connections.
 - Set/check high and low/bi-pass pressures.
 - Check aeration/burner operation.
 - Check that the air is purged from the gas line. (4 marks)
- (b) • Thermo Electric Flame Failure Device (1 mark)
- (c) Any FIVE (1 mark each)
- Thermocouple faulty.
 - Incorrect gas pressure.
 - Thermocouple not positioned correctly in flame.
 - Loose connections on the thermocouple.
 - Faulty electromagnet in flame failure device.
 - The burner may have blocked ports which stop the flame wrapping right around the burner.
 - The aeration may be incorrectly set causing flame lift. (5 marks)
- (d) Any FOUR (1 mark each)
- Piezo.
 - Electronic spark.
 - HIS/Glow coil.
 - Matches/manual ignition.
 - Flash tubes.
 - Permanent pilot (2 marks)

Total 12 marks

ANSWER 3

(a) Any FOUR (1 mark each)

- Pipe size.
- Available pressure.
- New appliance requirements.
- Supply capacity of the cylinders.
- Capacity of the regulator.

(4 marks)

(b) Any TWO (1 mark each)

- Purge the pipework
- Seal the pipework

(2 marks)

Total 5 marks

ANSWER 4

(a) Any FIVE (1 mark each)

- Clearances from cylinders to ignition sources.
- Clearances from cylinders to openings.
- Regulator vent clearances.
- Drainage away from cylinder base.
- Firm stable base.
- Vehicular traffic.
- Ease of access for exchange.

(5 marks)

(b) Any TWO (1 mark each)

- Enclosed in a lockable cage or cylinder valves and regulator covered by metal hood.
- Pipework arranged to protect against damage.

(2 marks)

Total 5 marks

ANSWER 5

(a) 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.
- Incorrect setting of the gas pressure.
- Insufficient primary aeration.
- Flame impingement.

(4 marks)

(b) (i) Name: Upper Explosive Limit
Meaning: The highest percentage of gas in air at which combustion can be self-sustaining
(2 marks)

(ii) Name: Lower Explosive Limit
Meaning: The lowest percentage of gas in air at which combustion can be self-sustaining
(2 marks)

Total 8 marks

ANSWER 6

(a) Any FOUR (1 mark each)

- New pipework.
- New appliances.
- Before work commences (existing installation).
- Reinstatement of a gas supply (after being disconnected for a period of time).
- After work has been done on an installation.

(4 marks)

(b) Any THREE (1 mark each)

- Temperature appliances cooling after use.
- Atmospheric conditions change.
- Pipe installation is being tampered with during the test.
- Faulty test equipment.

(3 marks)

(c) Any TWO (1 mark each)

- Atmospheric conditions changing.
- The supply regulator is letting by.
- Temperature changing.

(2 marks)

Total 9 marks

ANSWER 7

(a) • Room sealed (1 mark)

(b) Any FOUR (1 mark each)

- Temperatures above 65°C.
- Rodent attack.
- Engine exhaust system.
- Ultra violet light.
- Electrical service.
- Metallic structure.
- Mechanical damage

(2 marks)

(c) • 12000 mm² (2 marks)

(d) • Access can be gained without hazard, undue difficulty, or use of a tool. (1 mark)

Total 6 marks

ANSWER 8

(a) Any THREE (1 mark each)

- Extract fan in the same area as the appliance.
- Down draught on the flue.
- Blocked flue.
- Lack of ventilation.
- Incorrectly designed flue.

(3 marks)

(b) One of the products of combustion is water vapour. As the water vapour passes through the flue it cools down and changes state into water drops as it touches the cold sides of the flue.

(3 marks)

Total 6 marks

ANSWER 9

(a) $1 \text{ m} \times 5.8 \text{ m} \times 2.7 \text{ m} = 15.66$ (1 mark)

$1.5 \text{ m} \times 3.4 \text{ m} \times 2.7 \text{ m} = 13.77$ (1 mark)

$0.7 \text{ m} \times 1.4 \text{ m} \times 2.7 \text{ m} = 2.646$ (1 mark)

$2.646 + 13.77 + 15.66 = 32.076 \text{ m}^3$ (1 mark)

$32.076 \times 0.4 = 12.83 \text{ MJ/h}$ (2 marks)

Total 6 marks

ANSWER 10

(a) Name

- Auto-change-over regulator, two-stage regulator.

Explanation

Any ONE (1 mark)

- Automatically changes from one supply cylinder to a reserve when supply pressure drops.
- Two regulators to give a more precise pressure. (1 mark)

(b) Name

- Service regulator. OPSO regulator. (1 mark)

Explanation

Any ONE (1 mark)

- Over pressure relief, Filter, Insulator.
- Will stop gas supply for manual reset in an over pressure situation. (1 mark)

(c) Name

- Appliance regulator. (1 mark)

Explanation

- Easily adjustable and often with incorporated test points. (1 mark)

Total 6 marks

ANSWER 11

- (a) Any THREE (1 mark each)
- Overloaded circuits.
 - Flexible extension cords being damaged by sharp edges.
 - Electrical equipment being used in wet conditions.
 - Tripping.
 - Vehicular traffic. (3 marks)
- (b) • Double insulated (1 mark)
- Total 4 marks**

ANSWER 12

- (a) Soaker flashing (1 mark)
- (b) E2 External Moisture (1 mark)
- Total 2 marks**

ANSWER 13

- (a) Diagram to show (½ mark each)
- Electrical connections
 - Magnetic coil
 - Plunger
 - Spring
 - Valve
 - Seat (3 marks)
- (b) Power energises the coil, creating a magnetic field which attracts the plunger and lifts it off the valve seat allowing gas to flow. Once power stops, the spring pushes the plunger against the valve seat, stopping gas flow. (1 mark)
- Total 2 marks**

SECTION B

1. C Notifiable work
2. C 3rd family
3. A 10:1
4. E 1.55
5. B Fan interlock
6. C $(101.3 + \text{supply pressure}) \div 101.3$
7. D The regulator breather hole has been enlarged.
8. E 0°C
9. A 200 mm
10. D 50 MJ/h
11. E Gas Safety Certificate

Total 11 marks