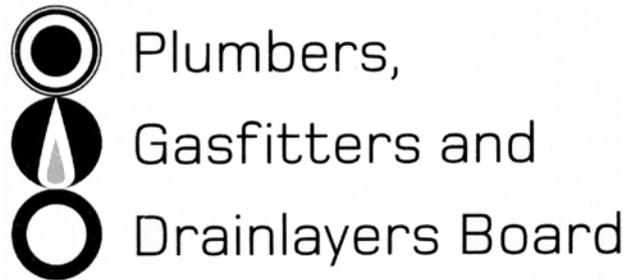


No. 9193



REGISTRATION EXAMINATION, JUNE 2015
LICENSED GASFITTER

ANSWER SCHEDULE

ANSWER 1

- (a) • Explosion
• Fire
• Asphyxiation (3 marks)

- (b) Natural gas
• Rises
• Natural gas is less dense than air (lighter) so it will rise

LPG

- Falls to the ground
- LPG is denser than air (heavier) so it will drop to the lowest point. (2 marks)

- (c) • Gas can gather and accumulate at low points rather than dissipating. (1 mark)

Total 6 marks

ANSWER 2

- (a) The maximum pressure at which an installation or any part of the installation stays safe. (1 mark)

- (b) The pressure measured of an installation while all appliances are in operation. (1 mark)

- (c) The pressure measured adjacent to the appliance burner while it is in operation. (1 mark)

- (d) The pressure measured of an installation while no appliances are in operation (1 mark)

Total 4 marks

ANSWER 3

- (a) Clearly drawn and will operate (1 mark)

- Thermo-couple
- Pilot or burners
- Electromagnet
- Iron disc (with plunger)
- Valve seat and seal
- Push button
- Spring
- Gas flow path

(½ mark each), (5 marks)

- (b) Any EIGHT (½ mark each)
- Button is pushed holding valve open
 - Flame is lit
 - Flame heats thermocouple tip
 - Current is generated powering electromagnet
 - Electromagnet holds valve open against the power of the spring
 - Let button go gas still flows
 - Flame is extinguished
 - Current stops generating
 - Electromagnet can no longer hold valve open against the power of the spring
 - Spring shuts gas supply (4 marks)
- (c)
- Flame rectification
 - Mercury vapour
 - UV (3 marks)
- Total 12 marks**

ANSWER 4

- (a) (i)
- Pipework test
 - New pipework has been installed (2 marks)
- (ii)
- Installation test
 - Appliances connected to new pipework (2 marks)
- (iii)
- Leakage test
 - Testing of an existing installation (2 marks)
- (b) Checking for leakage at connections made after a gas tightness test has been completed. (1 mark)
- (c) (i) 7 kPa (1 mark)
- (ii) 4 kPa (1 mark)
- (d)
- Pressurise the installation
 - Isolate appliances individually. Check test results to help find leaking section
 - Use leak detection solution or a gas detector to locate the leakage. (4 marks)
- (e) 0.20 kPa (1 mark)
- Total 13 marks**

ANSWER 5

- 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.
- Check for adequate water flow.

Total 5 marks

ANSWER 6

- (a) Restricts the gas flow to a predetermined limit if too much flow is detected. (2 marks)
- (b) • Pigtail on an LPG system
• LPG regulator (1 mark)
- (c) • Broken pigtail or other open end situation. (1 mark)

Total 4 marks

ANSWER 7

- (a) • The air for combustion is drawn from outside, the combustion products are expelled to outside.
• Room-sealed (2 marks)
- (b) Drawing to show;
• Outer flue: top flue over lower flue.
• Inner flue: Top flue inside lower flue. (2 marks)
- (c) • Outer flue to stop weather penetrating the flue
• Inner flue to keep condensate inside the inner flue. (2 marks)

Total 6 marks

ANSWER 8

- Disconnecting parts of metallic pipework.
- Cutting a metallic pipe in two.

Total 2 marks

ANSWER 9

- (a) (i) • The inner cone of a burner flame is touching an object (e.g. cooking pot)
• Soot appears on the object where it touches the flame (2 marks)
- (ii) • Normally expelled products of combustion are intruding on the air supply for a burner flame.
• The flame dances around excessively inhibiting complete combustion. (2 marks)
- (iii) • Insufficient primary air supplied to a burner
• The burner flame is lazy, yellow tipping and often causes soot. (2 marks)
- (iv) • Excessive primary air supplied to a burner
• Flame lift. The burner flame is harsh, pointy and often heard to roar. (2 marks)
- (b) Any TWO (1 mark each)
- The burner ports are blocked
 - The pilot flame is too small
 - The pilot is incorrectly positioned
- (2 marks)

Total 10 marks

QUESTION 10

- Fuse
 - Melts when current increases to a predetermined level, cutting off the power supply

 - Over heat switch
 - If a selected part of the appliance exceeds a predetermined temperature level, temporarily cuts off the gas supply.

 - Energy cut out
 - If the appliance exceeds a predetermined level, cuts off the gas supply.

 - Flame roll out detector
 - When flame spills from the front of the burner chamber this activates temporarily cutting off the gas supply

 - Thermal fuse
 - When flame spills from the front of the burner chamber this melts cutting off the gas supply

 - TPR valve
 - When temperature or pressure exceed a predetermined point the valve expels water to a safe location.

 - ODS Oxygen Depletion system
 - Stops gas supply if oxygen drops below a predetermined level.
- (2 marks each device and explanation)
- Tilt switch.
 - Shut off the gas if the appliance is to tip over.

Total 10 marks

QUESTION 11

Drawing to show:

- Diaphragm
- Orifice / Valve seat
- Spring
- Lever

(1 mark each)

- Relief spring
- Vent spring and valve
- Breather hole
- Filter
- Cap
- Fulcrum

(any four, 1/2 mark each)

Total 6 marks

QUESTION 12

(a) 4 min 10 seconds = 250 seconds

(1 mark)

$$0.05 \times 3600 = 180$$

(1 mark)

$$180 \div 250 = 0.72$$

(1 mark)

$$0.72 \times 40 = 28.8 \text{ MJ/h}$$

(1 mark)

(b) $28.8 \div 3.6 = 8$

(1 mark)

Total 5 marks

QUESTION 13

(a) Any FOUR (1 mark each)

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

(4 marks)

(b) • Rubber grommet or similar protection

- Penetration to be vapour-proof

(2 marks)

Total 6 marks

SECTION B

- 1 D E2.
- 2 E A device which helps prevent flame lift off.
- 3 C BS08C35 (buff).
- 4 D 800 mm.
- 5 A Condensation.
- 6 B 25 mm.
- 7 E 1,000 mm.
- 8 B 30 MJ/h.
- 9 C 5.0 m.
- 10 D 12 months.

Total 10 marks