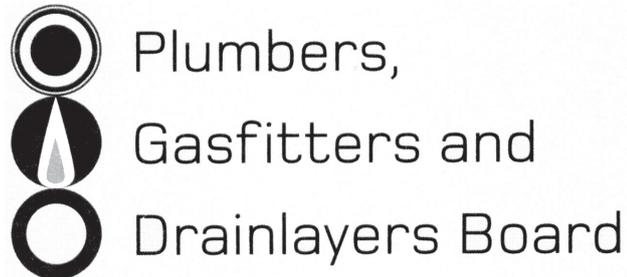


No. 9193



REGISTRATION EXAMINATION, NOVEMBER 2014
LICENSED GASFITTER

ANSWER SCHEDULE

ANSWER 1

- (a) The gas is poisonous and breathing the gas can cause damage which may be irreversible. (1 mark)
- (b) Carbon monoxide. (1 mark)
- (c) • Asphyxiation may result as breathable air is replaced in the lungs causing suffocation.
• Explosion/fire. (2 marks)
- (d) • Carbon dioxide.
• Water vapour. (2 marks)

Total 6 marks

ANSWER 2

- (a) Any THREE (1 mark each)
- The gap is too large.
 - The electrode has cracked.
 - The high tension lead has broken down.
 - The piezo assembly has broken.
 - The earth circuit for the piezo is no longer adequate. (3 marks)
- (b) • Hot surface igniter (glow coil).
• Electronic spark ignition.
• Permanent pilot (includes flash tubes). (3 marks)

(c)

Flame Failure device	Appliance type where found
TEFFD	Space heater, water heater
Rectification	An electronic gas appliance (eg heater, cooker)
UV	Package burner
Mercury vapour	Oven

(½ mark each device, ½ mark each appliance type)

(4 marks)

(d) Any FIVE (1 mark each)

- Gas control valve.
- Thermo-electric flame failure device.
- Pilot adjuster.
- Main burner regulator.
- Snap acting thermostat.
- Thermal energy cut off device.
- Integral Peizo Igniter.
- Filter.
- Pressure test points.

(5 marks)

Total 15 marks

ANSWER 3

(a) Volume of hallway = $\frac{(3.0+2.5)}{2} \times 1.6 \times 7.0$
= 30.8 m³

OR

Volume of hallway = $(2.5 \times 1.6 \times 7.0) + (\frac{1}{2} \times 0.5 \times 1.6 \times 7.0)$
= 28 + 2.8
= 30.8 m³ (2 marks)

Rating = $30.8 \times 0.4 = 12.3$ MJ/h (2 marks)

(4 marks)

(b) Vol = $0.125 \times 12 = 1.5$ m³ (1 mark)

Energy used per hour = $40 \times 1.5 = 60$ MJ/h (1 mark)

(2 marks)

(c) $1.5 \times 2 = 3$ (1 mark)

Vol of air = $3 \times 10 = 30$ m³ (1 mark)

(2 marks)

Total 8 marks

ANSWER 4

(a)	A	Phial / bulb / sensor
	B	Capillary
	C	Bellows

(1 mark each part, 3 marks)

- (b)
- The capillary tube has broken.
 - The phial is covered in lint.
 - The phial has been moved to a wrong position.

(1 mark each, 3 marks)

Total 6 marks

ANSWER 5

- (a)
- Water or debris may enter the regulator.
 - In the event of an over pressure situation the diaphragm may rupture because the relief cannot activate.

(1 mark each, 2 marks)

- (b)
- The hole is the breather vent for the space above the diaphragm. (1 mark)

- (c)
- The diaphragm would have trouble moving due to the air above it not being able to escape. (1 mark)

Total 4 marks

ANSWER 6

Clause	Title
B2	Durability
E2	External moisture
G4	Ventilation

Total 3 marks

ANSWER 7

- In brazing, two pieces of metal are joined by a third dissimilar material with a lower melting point. Melting this third material between the surfaces of the original pieces binds the pieces together. (1 mark)
- In fusion welding, the metals melt, allowing them to combine. (1 mark)

Total 2 marks

ANSWER 8

- (a) (i) Leakage test (1 mark)
- (ii) To allow any pressure or temperature fluctuations caused by preparing the test to stabilise. (1 mark)
- (iii) Installation operating pressure or 2 kPa whichever is greater. (2 marks)
- (iv) 0.35 kPa (1 mark)
- (b) Any SIX (1 mark each)
- The pressure of the test.
 - The length of time the test was.
 - The test results.
 - The address of the installation.
 - The date the test took place.
 - The consumer's name.
 - The person who performed the test.
 - The standard to which the pipework was tested.
 - The part of the installation that was tested. (6 marks)
- (c) (i) 0.8
- (ii) 1.6
- (iii) 1.05
- (iv) 0 (4 marks)
- (d) 2 kPa. (1 mark)

Total 16 marks

ANSWER 9

- (a) • Pipework size.
• Meter size.
• Installation pressure.
• Gas type. (1 mark each, 4 marks)
- (b) Any FOUR (1 mark each)
- Proximity to most frequently uses of hot water.
 - Position where flue can be installed safely.
 - Adequacy of ventilation.
 - Base of sufficient strength to support weight.
 - Proximity to a drain.
 - Position of water connections.
 - Structure to attach seismic restraint.
 - Location. (4 marks)
- Total 8 marks**

QUESTION 10

- (a) (i) Any THREE (1 mark each)
- Air for combustion drawn from outside.
 - Products of combustion discharged outside.
 - Appliance is sealed from the room.
 - Intake and discharge through common terminal. (3 marks)
- (ii) Any THREE (1 mark each)
- Air for combustion is drawn from room.
 - Products are discharged outside.
 - Flames are open to the room.
 - Has a down draught diverter. (3 marks)
- (iii) • Air for combustion is drawn from room.
• Products discharged into room.
• Flames are open to the room. (3 marks)
- (b) Any THREE (1 mark each)
- The warm products of combustion contain water vapour and are passing through the cold heat exchanger and flue. The cold surfaces are cooling the flue gases making the water vapour condense into water droplets.
- Once the heat exchanger and flue warm up, less water vapour is visible as water droplets in the flue gases. (3 marks)
- Total 12 marks**

QUESTION 11

(a) Any FOUR (1 mark each)

- Asbestos roofing.
- External cladding.
- Rope used to seal fire doors and boilers.
- Hot water pipe lagging.
- Gas flues.
- Roof flashings.
- Spray on fireproofing.
- Large water mains.
- Decorative spray-on ceilings.
- Insulation in roof spaces.
- Floor coverings.
- Asbestos cement board.

(4 marks)

(b) • Asbestos is hazardous when it becomes airborne. If inhaled, fibres can damage lungs and cause illness which can result in death.

(2 marks)

(c) Any FOUR (1 mark each)

- Any commercial logging operation or tree-felling operation.
- Work where workers could fall 5 m or more, excluding work on a two-storeyed house, or work on a power or telephone line, or work carried out from a ladder only, or maintenance or repair work of a minor or routine nature.
- The erection or dismantling of scaffolds from which a person could fall 5 m or more.
- Every excavation which is more than 1.5 m deep and which is deeper than it is wide at the top.
- Any form of tunnel or drive where workers work underground, irrespective of timbering or support.
- Those excavations where the excavated face is steeper than 1 horizontal to 2 vertical.
- Any construction work where explosives are used or stored.
- Work such as diving, where construction workers breathe air or any other gas that has been compressed or is under pressure.
- Lifts of half a tonne (500 kg) or more (a vertical distance of 5 m or more) carried out by mechanical means other than by a mobile crane, excavator or forklift.

(4 marks)

Total 10 marks

SECTION B

- 1 B 80% of the length of the hose assembly.
- 2 A A blockage in the lint trap.
- 3 D Fan interlock.
- 4 A The contamination of the air supply by products of combustion.
- 5 B 2.
- 6 E 600 mm.
- 7 C Multilayer proprietary systems.
- 8 A 25 mm.
- 9 D 500 mm.
- 10 A Quick connect device.

Total 10 marks