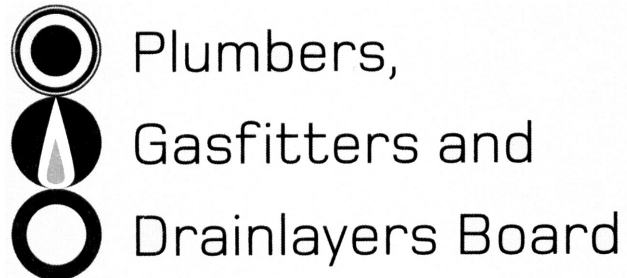


No. 9193



REGISTRATION EXAMINATION, NOVEMBER 2012
LICENSED GASFITTER

ANSWER SCHEDULE

ANSWER 1

- (a) 101.3 kPa (1 mark)
- (b) 1 15°C
2 Sea level (2 marks)
- (c) The pressure of the atmosphere pressing onto the earth's surface. (1 mark)
- (d) 1 Temperature.
2 Altitude.
3 Weather. (3 marks)
- (e) Gauge pressure plus atmospheric pressure. (1 mark)

Total 8 marks

ANSWER 2

- (a) Blocked flue/heat exchanger.
Combustion products or heat spilling out combustion chamber opening. (2 marks)
- (b) ECO (Energy Cut Off). (1 mark)
- (c) Any TWO (1 mark each)
- Fire risk down draught diverter must be clear.
 - Inhibit ventilation for flue dilution and ambient temperature.
 - Down draught diverter may not perform adequately. (2 marks)
- (d) Pilot flame too small
- The thermocouple may not be able to generate sufficient mV.
- Pilot flame too large
- The tip will be over heated and shorten the life of the thermocouple. (2 marks)
- (e)
- The button is manually depressed holding the valve open permitting gas flow.
 - The pilot is ignited.
 - The button is held down.
 - The pilot flame heats the thermocouple tip.
 - Sufficient mV is generated to hold the valve against the electromagnet.
 - The button is released.
 - When the flame goes out the lack of heat stops mV generation.
 - The spring pushes the valve closed stopping gas flow when insufficient mV is available to hold the valve open. (4 marks)

Total 11 marks

ANSWER 3

Stabilisation Time	Test Time	Test Pressure	Pressure Loss
2 minutes	5 minutes	7.5 kPa	Nil

(3 marks)

(b) Any THREE (1 mark each)

- Pipework still cooling.
- Sun or cloud.
- Atmospheric pressure fluctuations.
- Leaking test gear.
- People interfering with the pipework while test is in progress.

(3 marks)

(c) Any THREE (1 mark each)

- Leakage test before commencing.
- Pipework test on new or altered pipework.
- Installation or leakage test.
- Final connection test.

(4 marks)

Total 10 marks

ANSWER 4

Any TWO (1 mark each)

- To ensure any leakage around the cylinders cannot enter the boat.
- Ventilation cannot be installed at low level in the boat.
- LPG is heavier than air and if it were to leak into the boat it cannot escape to atmosphere and will gather in the bottom of the boat.
- Limited space on the deck.

Total 2 marks

ANSWER 5

(a) Adventitious

- Existing air movement throughout an area (gaps, openings and normal building ventilation).

Natural

- Permanent openings provided to encourage air movement.

Mechanical

- Via use of a fan or other mechanical air movement device or system. (3 marks)

(b) • Incomplete combustion.

- Creation of corrosive products.

(2 marks)

Total 5 marks

ANSWER 6

Any THREE (2 marks each – 1 mark for the material, 1 mark for the limitation)

- Copper – Not below ground unless protected.
- Galvanised Steel /Iron – Not below ground unless protected.
- Black Steel/Iron – Must be protected against corrosion in all situations.
- Polyethylene – Not above ground unless shielded.
- Macro- composite (PE/Al) – Not exposed to UV.

Total 6 marks

ANSWER 7

Office volume = $3 \times 2 \times 3 = 18 \text{ m}^3$ (1 mark)

Workshop volume = $3,142 \times 36 = 113.112$ (1 mark)

$113.112 \times 18 = 2036.016$
 $2036.016 \div 2 = 1018.008$ (1 mark)

$1018.008 + 18 = 1036.008$ (1 mark)

Heat input = Room vol \times 0.36 = 1036.008×0.36 (1 mark)

= 372.962 MJ/h (1 mark)

Total 6 marks

ANSWER 8

(a) Any TWO (1 mark each)

- Quick to install.
- Light weight.
- Easily change direction.
- Sound dampening properties.

(2 marks)

Any TWO (1 mark each)

- Damage resistant mechanical.
- Self-supporting over straight runs.
- Weather and environment resistant.
- Smoother interior.

(2 marks)

Total 4 marks

ANSWER 9

(a) Any FOUR (1 mark each)

- To ensure safe start up.
- To ensure safe operation.
- To check safety controls.
- To check operating controls.

(4 marks)

- (b)
- Incomplete combustion, over-gassing and under-aeration (lack of air).
 - The gas consumption will not match the data plate information.

(2 marks)

Total 6 marks

ANSWER 10

Drawing to include:

- Burner. (½ mark)
- Combustion chamber. (1 mark)
- Combustion air pathway. (1 mark)
- Combustion gases pathway. (1 mark)
- Room sealed. (2 marks)
- Terminal. (½ mark)

Total 6 marks

ANSWER 11

(a) Items of information	Unit
Example: <i>Speed</i>	Example: <i>km/hr</i>
Gas appliance energy consumption	MJ/hr or kW
Heating value of a gas	MJ/m ³
Gas appliance efficiency	%
Carbon monoxide in a room	ppm or %
Thermal expansion	mm/°
Flame speed	m/sec

(1 mark each answer – 6 marks)

- (b) (i) 29.54 MJ
(ii) 1.24 kPa

(1 mark)

(1 mark)

Total 8 marks

ANSWER 12

Fulcrum	L	Regulator loading spring	G
Orifice	B	Pressure relief spring	D
Filter	A	Breather	I
Diaphragm	C	Regulator adjustment screw	E
Relief vent valve	J	Regulator valve	M

(½ mark each)

Total 5 marks

ANSWER 13

(a) $15 \times 3.6 = 54$ (1 mark)

$\frac{54}{90} = 0.6 \text{ m}^3$ (1 mark)

(2 marks)

(b) 12.3 kW

(1 mark)

Total 3 marks

SECTION B

1. E The injectors are the wrong size.
2. A A burner could extinguish.
3. D An explosion could occur within the pipework.
4. E AS/NZS 5601.2
5. B Mercaptan.
6. A 2%
7. D LPG and air.
8. E Carbon dioxide and methane.
9. A 7 kPa
10. B 25 mm
11. E 50 mm
12. B 32 mm
13. B 300 mm
14. E 100 mm
15. A Should.
16. B 8 m
17. A A ceiling space.
18. E 3 m
19. D 600 mm
20. D An AC electrical current is partially rectified to DC as it passes through.

Total 20 marks