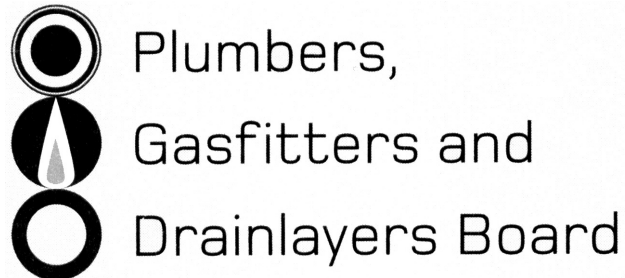


No. 9196



REGISTRATION EXAMINATION, NOVEMBER 2011  
**CERTIFYING GASFITTER**

**ANSWER SCHEDULE**



## ANSWER 1

Any TWO (1 mark each)

- (a) The chimney is not well sealed.  
The appliance manufacturer requires it.  
To provide better flue pull due to uniform shape (multiple direction changes). (2 marks)
- (b) If the temperature exceeds 300°C.  
Where mechanical damage could occur. (1 mark each, 2 marks)

**Total 4 Marks**

## ANSWER 2

- (a) 500 mm. (1 mark)
- (b) (i) When storing over 100 kg of LPG (1 mark) on one site for longer than 18 hours (1 mark). (2 mark)
- (ii) 1.5 m. (1 mark)
- (iii) Attaching a vent line to the regulator vent and running it to a suitable location. (1 mark)
- (c) Drawing to include:
- |                        |          |
|------------------------|----------|
| Flexible pigtails      | (½ mark) |
| Excess flow devices    | (½ mark) |
| Change over valve      | (½ mark) |
| Change over indicator  | (½ mark) |
| First stage regulator  | (½ mark) |
| Second stage regulator | (½ mark) |
| Regulator relief       | (½ mark) |
| Pressure test point    | (½ mark) |
| Weather proofing       | (1 mark) |
| Chains                 | (1 mark) |
| Concrete Pad           | (1 mark) |
| Drawing Clarity        | (1 mark) |

(8 marks)

**Total 13 Marks**

### ANSWER 3

- (a) Any FOUR (1 mark each)
- Gas pressure too high.
  - Blocked flue (obstruction or wind direction).
  - Flue fan (combustion fan) faulty, not performing well enough.
  - Blocked heat exchanger (partially).
  - Faulty overheat device or associated circuitry. (4 marks)
- (b) Any FOUR (1 mark each)
- Low gas pressure.
  - Faulty/dirty flame sensor probe or lead.
  - Partially blocked burner or heat exchanger.
  - Faulty earth circuit.
  - PCB Fault. (4 marks)

**Total 8 Marks**

### ANSWER 4

- (a)  $0.05 \times 40 = 2$
- $2 \times 3600 = 7200$  (2 marks)
- Energy input  $7200/70 = 102.85$  MJ/hr (1 mark)
- Energy input in kW =  $102.85/3.6 = 28.5$  kW (1 mark)
- Energy output = 80% of 28.5 = 22.83 kW (1 mark)
- (5 marks)
- (b) Energy passed would increase. (1 mark)

**Total 6 Marks**

## ANSWER 5

Nat Gas done

Pipe Section	MJ	Diameter	Pipe Section	MJ	Diameter
A - B	1135.5 (½ mark)	40 (½ mark)	I - K	196 (½ mark)	20-25 (½ mark)
B - C	210 (½ mark)	20-25 (½ mark)	H - L	451.5 (½ mark)	25-32 (½ mark)
C - D	60 (½ mark)	15-20 (½ mark)	L - M	128 (½ mark)	20 (½ mark)
C - E	150 (½ mark)	20 (½ mark)	L - N	323.5 (½ mark)	25 (½ mark)
B - F	925.5 (½ mark)	32-40 (½ mark)	N - O	31.5 (½ mark)	15 (½ mark)
F - G	150 (½ mark)	20 (½ mark)	N - P	292 (½ mark)	25 (½ mark)
F - H	775.5 (½ mark)	32 (½ mark)	P - R	96 (½ mark)	20 (½ mark)
H - I	324 (½ mark)	25 (½ mark)	P - Q	196 (½ mark)	20-25 (½ mark)
J - I	128 (½ mark)	20 (½ mark)			

Supply Pressure	2.75 kPa (1 mark)
Length of Longest Run	6 m - 7.5 m (1 mark)
Design Pressure Drop	0.275 kPa (1 mark)
Installation Pressure Drop/m	0.035 - 0.045 (1 mark)
Quantity of 15 mm Appliance Regulators	3 (½ mark)
Quantity of 20 mm Appliance Regulators	6 (½ mark)
Quantity of 15 mm Flexible Hoses	1 (½ mark)
Quantity of 20 mm Flexible Hoses	4 (½ mark)

LPG done

Pipe Section	MJ	Diameter	Pipe Section	MJ	Diameter
A - B	1194 (½ mark)	32 (½ mark)	I - K	204 (½ mark)	20 (½ mark)
B - C	222 (½ mark)	20 (½ mark)	H - L	472 (½ mark)	25 (½ mark)
C - D	62 (½ mark)	15 (½ mark)	L - M	136 (½ mark)	15-20 (½ mark)
C - E	160 (½ mark)	20 (½ mark)	L - N	336 (½ mark)	20 (½ mark)
B - F	972 (½ mark)	25-32 (½ mark)	N - O	34 (½ mark)	8-10 (½ mark)
F - G	160 (½ mark)	20 (½ mark)	N - P	302 (½ mark)	20 (½ mark)
F - H	812 (½ mark)	25 (½ mark)	P - R	98 (½ mark)	15 (½ mark)
H - I	340 (½ mark)	20 (½ mark)	P - Q	204 (½ mark)	20 (½ mark)
J - I	136 (½ mark)	15-20 (½ mark)			

Supply Pressure	3.025 kPa (1 mark)
Length of Longest Run	6 m - 7.5 m (1 mark)
Design Pressure Drop	0.3 kPa (1 mark)
Installation Pressure Drop/m	0.04 - 0.05 (1 mark)
Quantity of 15 mm Appliance Regulators	0 or 3 (½ mark)
Quantity of 20 mm Appliance Regulators	0 or 6 (½ mark)
Quantity of 15 mm Flexible Hoses	1 (½ mark)
Quantity of 20 mm Flexible Hoses	4 (½ mark)

**Total 23 marks**

## ANSWER 6

- (a)  $0.25 \div 25 = 0.01$  (1 mark)  
25 mm pipe (1 mark) (2 marks)
- (b)  $0.25 \div 25 = 0.01$  (1 mark)  
32 mm pipe (1 mark) (2 marks)
- Total 4 Marks**

## ANSWER 7

- $\pi(3.142) \times 12.5 \times 12.5 = 490.93$  (1 mark)  
 $\pi(3.142) \times 10 \times 10 = 314.2$  (1 mark)  
 $490.93 + 314.2 = 805.13$  (1 mark)  
 $805.13 \div \pi(3.142) = 256.247$  (1 mark)  
Square root of 256.247 = 16.00 (½ mark)  
R = 16 mm so diameter of common vent is 32 mm (½ mark)
- Total 5 Marks**

## ANSWER 8

- (a) The hob must be vapour sealed from the refrigerator.  
So any gas leaking from the hob cannot be ignited by the fridge burner. (2 marks)
- (b) A carbon monoxide detector must be installed.  
All appliances must have ODS systems. (2 marks)
- (c) Pop up type require the ventilation to work whether the pop top is up or down the collapsible type only requires it while erected. (1 mark)
- (d) Not subject to temperatures above 50°C.  
100 mm from an exhaust.  
Protected from ultra violet light.  
Minimised chance of rodent attack. (½ mark each), (2 marks)
- (e) 19 mm ID minimum.  
Led to outboard.  
Continuous fall.  
Positioned so it cannot be submerged. (½ mark each), (2 marks)
- Total 9 Marks**

## ANSWER 9

- (a) (i)  $41000 + 68000 = 109000$  (½ mark)  
 $109000 \times 0.00029 = 31.61 \text{ kW}$  (1 mark)  
 $2200 \times 31.61 = 69542$  (½ mark)  
 $650 \times 5 = 3250$  (½ mark)  
 $69542 + 3250 = 72792$  (½ mark) (3 marks)
- (ii)  $72792 \div 240 = 303.3 \text{ mm}$  (1 mark)
- (b) (i) Any TWO (½ mark each)  
Behind the appliance  
vented to outside  
One above the absorption fins  
One at low level (1 mark)
- (ii)  $32500 \text{ mm}^2$  free ventilation area (1 mark)
- (iii) Appliance runs all of the time (1 mark)  
Sleeping area (1 mark) (2 marks)

**Total 8 Marks**

## SECTION B

1. B Fire bricks, set in fire clay.
2. E 600 mm.
3. C Four times the weight of the cylinder.
4. D Two 15 kg cylinders.
5. E 50 mm.
6. E 5 m.
7. D  $4000 \text{ mm}^2$ .
8. B 12%.
9. B 0.6 m.
10. E  $45^\circ\text{C}$ .
11. A 20 l/s.
12. B 75 mm or D 150 mm.
13. E 1.2 m.
14. A QCC.
15. D 450 mm.
16. B 3.0 kpa.
17. A  $100 \text{ W/m}^3$ .
18. C 20 mm per 1 m.
19. A  $10 \text{ m}^3$ .
20. D 50 MJ.

**Total 20 Marks**