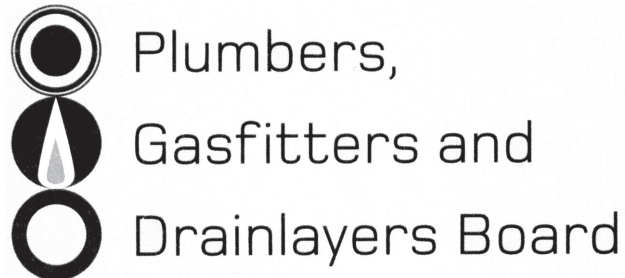


No. 9196



REGISTRATION EXAMINATION, JUNE 2014  
**CERTIFYING GASFITTER**

**ANSWER SCHEDULE**

## ANSWER 1

Any THREE (1 mark each)

- The Health Act.
- The Plumbers Gasfitters and Drainlayers Act.
- The Building Act.
- The Gas Act.

**Total 3 Marks**

## ANSWER 2

Maximum outlet operating pressure LPG	3.5 kPa
Maximum outlet operating pressure natural gas	1.5 kPa

**Total 2 Marks**

## ANSWER 3

- (a)  $0.05 \times 3600 = 180$  (1 mark)  
 $180 \div 42 = 4.28 \text{ m}^3$  (1 mark)  
Energy input =  $4.28 \times 40 = 171.42 \text{ MJ}$  (1 mark)  
 $(101.3 + 11) \div 101.3 = 1.108 \text{ MJ}$  (1 mark)  
Corrected energy input =  $171.42 \times 1.108 = 189 \text{ MJ}$  (1 mark)  
(5 marks)
- (b) Output = 85% of 189 = 160 (1 mark)  
 $160 \div 3.6 = 44.6 \text{ kW}$  (1 mark)  
(2 marks)

**Total 7 Marks**

## ANSWER 4

- (a)  $20,000 \times 4 = 80,000$  (1 mark)  
 $80,000 \div 1600 = 50$  (1 mark)  
50 mm (1 mark)  
Top and bottom (1 mark) (4 marks)
- (b) • To allow room for vaporisation in the cylinder.  
• To allow for expansion due to increases in temperature. (2 marks)

- (c) Diagram to show:
- Slabs.
  - 1st and 2nd stage regulators.
  - Pigtails.
  - Excess flow in pigtails.
  - Chains.
  - Test point.
  - Drip Leg.

(7 marks)

**Total 13 Marks**

**ANSWER 5**

Pipe Section	Length Metres	Main Run m	Gas Flow (MJ/h)	Nominal Size
A – B	5	31.8	1346	50 mm
B – C	1.5		24	10 mm
B – D	3.5		1322	50 mm
D – E	1.5		24	10 mm
D – F	3.7		1298	50 mm
F – G	1.5		24	10 mm
F – H	5.3		1274	50 mm
H – I	2		440	32 mm
H – J	3		834	40 mm
J – K	3		626	32 mm
K – L	2		422	32 mm
L – M	1		62	20 mm
J – N	5		208	25 mm
N – O	4		160	20 mm
N – P	2.5		48	15 mm
P – Q	1.5		24	10 mm
P – R	3.8	24	10 mm	

(½ mark)

(½ mark each)

(1 mark each)

**Total 26 Marks**

**ANSWER 6**

- (a) Vol. of 9 m 25 mm diam. pipe =  $\pi \times 0.0125^2 \times 9 = 0.00442 \text{ m}^3$   
 Vol. of 12 m 25 mm diam. pipe =  $\pi \times 0.0125^2 \times 12 = 0.00589 \text{ m}^3$   
 Vol. of 32 mm diam. pipe =  $\pi \times 0.016^2 \times 8 = 0.00643 \text{ m}^3$   
 Vol. of 40 mm diam. pipe =  $\pi \times 0.020^2 \times 16 = 0.02011 \text{ m}^3$  (4 marks)

- (b) • The pipework is over 30 litres and is defined as a large volume.  
 • Should be purged to outside atmosphere.  
 • The purge outlet should be at least 6 m away from any ignition source and well clear of any opening into a building.

(2 marks)

**Total 6 marks**

## ANSWER 7

(a)

Plant room Appliances	Minimum supply airflow Mechanical L/s	Location of supply opening	Minimum size of natural exhaust opening mm <sup>3</sup> (directly to outside)	Location of exhaust opening
Continuous flow water heater 220 MJ (Forced draft)	$220 \times 0.3$ = 66 litres/s	At or below burner level	$220 \times 150$ = 33000	Other side to promote crossflow of air
Natural draft Heating unit 150 MJ (atmospheric)	$150 \times 0.5$ = 75 litres/s	At or below burner level	$150 \times 150$ 22500	Above the downdraught diverter

(2 marks)                      (1 mark)                      (2 marks)                      (1 mark)

(6 marks)

- (b)
- No appliances are deprived of air required for combustion or draught diverter dilution.
  - The air pressure is not less than atmospheric at a gas appliance.
- (1 mark)

**Total 7 Marks**

## ANSWER 8

- (a) EITHER
- Structure built at ground level and lifted into position on completion.
- OR
- Long-handled tools be used from ground level. (1 mark)
- (b)
- Edge protection.
  - Guard-railed work platform (e.g., scaffold or elevating work platforms).
  - Total restraint system to prevent a fall occurring. (2 marks)
- (c)
- Fall arrest system.
  - Nets or air bags to minimise the impact of a fall.
  - Where unguarded trestles or platforms are used, or the work will be done from a ladder or stilts, the risk of harm shall be minimised through management controls and the provision of appropriate training. Management controls include effective housekeeping protocols and clear procedures for safe use of the equipment. (3 marks)

(d) Any FIVE (1 mark each)

- Lack of or inadequate planning and hazard assessment.
- Inadequate supervision.
- Insufficient training for the task being carried out.
- Incorrect protection or equipment choices.
- Incorrect use or set-up of equipment including personal protective equipment.
- Unwillingness to change the way a task is carried out when a safer alternative is identified.
- Suitable equipment being unavailable.

(4 marks)

**Total 10 Marks**

## **ANSWER 9**

(a) (i) EITHER

- Group controls protect multiple people from falling. The best work methods are those that don't require any active judgement by the workers to keep themselves safe, such as edge protection, scaffold, and elevating work platforms.

OR

- Personal controls only look after individuals and rely on active judgement by the user for them to work safely (e.g., fall restraint harness and fall arrest).

(2 marks)

(ii) Any TWO (1 mark each)

- Scaffolding.
- Edge protection.
- Mechanical access plant.
- Safety mesh or net.

(2 marks)

(iii) Any TWO (1 mark each)

- Temporary work platforms.
- Harness systems.
- Inflating air suits.

(2 marks)

(b) Any FOUR (1 mark each)

- Be erected by a competent person and used in accordance to the manufacturer's specifications.
- Remain level and plumb at all times.
- Be kept at least one metre from open floor edges and openings unless the edge is protected to prevent the scaffold tipping.
- Never be accessed until all the castors are locked to prevent movement.
- Never be moved while anyone is on it.
- Be clear from overhead power lines.

(4 marks)

**Total 10 Marks**

## ANSWER 10

- (a) • Cross at an angle of not less than 45%.  
• Have the required vertical separation. (2 marks)
- (b) • Within the middle third of the joist.  
• Diameter not exceeding 20% the depth or 32 mm whichever is less (32 mm).  
• Not more than three times the depth of joist from joist support (600 mm). (3 marks)

**Total 5 Marks**

## SECTION B

1. C 500 mm.
2. B 6 mm.
3. D 1000 mm.
4. E Because of the corrosive nature of condensate.
5. B The valve will not operate quickly enough in the event of flame loss.
6. E The baffle collapses into the burner chamber blocking the primary flue.
7. D QCC.
8. D 450 mm.
9. B A custom designed method that is not included in the building code but will fulfil the requirements of the code.
10. E 560 mm.
11. D 3.0 kPa

**Total 11 Marks**