No. 9196

Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, NOVEMBER 2014

# CERTIFYING GASFITTER

ANSWER SCHEDULE

## ANSWER 1

| Pipe Section | Number of clips | Rod hanger size |
|---|---|---|
| A – B 100 mm diameter pipe | 11 | 16 mm |
| B – C 65 mm diameter pipe | 6 | 12 mm |
| B – D 40 mm diameter pipe | 5 | 10 mm |
| D – E 25 mm diameter pipe | 9 | 10 mm |
| D – F 32 mm diameter pipe | 5 | 10 mm |
| F – G 20 mm diameter pipe | 12 | 10 mm |
| | (1 mark each) | (½ mark each) |

**Total 9 Marks**

## ANSWER 2

| **Unit 1** Length of longest run: | 12.9 – 13.9 m | | |
|---|---|---|---|
| Pipe Section | Section length | MJ | Diameter |
| A – B | 2.4 – 2.7 m | 242 | 25 mm |
| B – C | 3.3 – 3.5 m | 30 | 15 mm |
| B – D | 2.0 – 2.2 m | 212 | 25 mm |
| D – E | 6.0 – 6.1 m | 188 | 25 mm |
| D – F | 8.5 m – 9.0 m | 24 | 10 mm OR 15 mm |

| **Unit 2** Length of longest run: | 19.2 – 20.0 m | | |
|---|---|---|---|
| Pipe Section | Section length | MJ | Diameter |
| A – B | 9.0 – 9.3 m | 242 | 25 mm OR 32 mm |
| B – C | 5.9 – 6.0 m | 24 | 15 mm |
| B – D | 3.5 – 3.7 m | 218 | 25 mm OR 32 mm |
| D – E | 6.7 – 7.0 m | 188 | 25 mm |
| D – F | 5.9 m – 6.5 m | 30 | 15 mm |

| **Unit 3** Length of longest run: | 27.8 – 28.5 m | | |
|---|---|---|---|
| Pipe Section | Section length | MJ | Diameter |
| A – B | 15.8 – 16.0 m | 242 | 32 mm |
| B – C | 4.6 – 5.0 m | 30 | 15 mm OR 20 mm |
| B – D | 2.0 – 2.2 m | 212 | 25 mm OR 32 mm |
| D – E | 7.4 m – 7.5 m | 188 | 25 mm OR 32 mm |
| D – F | 10.0 – 10.3 m | 24 | 15 mm |

NB. Diameters can be found from tables or graphs. (Each entry ½ mark)

**Total 24 Marks**

## ANSWER 3

(a) (i) Any TWO (1 mark each)

- Replacement of a gas appliance with an equivalent gas appliance, except in a caravan or boat with sleeping quarters, provided the work does not involve:
  - the repositioning of pipework or flue, or
  - a change in the installation pressure, gas type, ventilation, energy consumption, or operation of the installation.
- The maintenance of fittings and appliances other than repairs following a notifiable accident.
- The replacement of instrumentation and related controls, but only if the work does not result in the repositioning or disturbance of other pipework.
- The setting of safety devices, combustion conditions, and controls that are not designed to be adjusted by a consumer or gas refueller.
- Temporary gasfitting for experimental, testing, demonstration, teaching, or research purposes in a gas engineering workshop, manufacturing facility, gas test facility, laboratory, hospital, research project, or teaching institution.

(2 marks)

(ii) Any TWO (1 mark each)

- Addition or alteration to an existing installation.
- Work not carried out in accordance with the means of compliance in the Installation Standard.
- Work on an installation that includes gas pressure-raising equipment.
- Repair work following a notifiable accident.
- Work in domestic premises where the maximum operating pressure is more than 7 kPa for natural gas or more than 14 kPa for LPG.
- Work in a building of more than three storeys which contains three or more separate dwellings.
- Work done to AS/NZS 5601.1 where the supply pressure to the installation is greater than 200 kPa.
- Work done to AS/NZS 5601.2 where the supply pressure to the installation is greater than 3 kPa.
- Work done within 20 metres of a hazardous area.
- Work done in a building in which air pressure is controlled by a mechanical ventilation system.
- Work done in a place where combustion air may be varied by mechanical means.
- Work done in a caravan or boat that contains sleeping accommodation.

(2 marks)

(iii) • General gasfitting is gasfitting that is not categorised as low-risk or high-risk work.

(1 mark)

(b)

| Situation | Risk Category |
|---|---|
| Replacing a gas hob by another one of the same model. | Low |
| Installing a new gas hob in a house. | General |
| Adding a gas hob to an existing installation in a house. | High |
| Installing a gas hob in a caravan with sleeping quarters. | High |

(4 marks)

**Total 9 Marks**

## ANSWER 4

Any TEN (½ mark for each correct operation, ½ mark for each in correct order)

1 Hot water tap is opened.
2 Min. flow rate of 2.5 lpm. The Water Flow Sensor sends a pulse signal to the PCB.
3 Fan completes a pre purge.
4 The igniter starts sparking.
5 Gas Inlet Solenoid Valves open.
6 The Proportional Gas Flow Regulating Valve allows adequate gas for ignition.
7 Gas ignites at the Burner.
8 Flame sensor detects burner flame.
9 The PCB adjusts the hot water temperature by opening and closing the Gas Solenoid Valves, the Proportional Gas Flow Regulating Valve and via the Water Flow Servo Motor to ensure the selected temperature of hot water is delivered. (Modulation)
Hot tap is closed.
10 The pulse signal from the Water Flow Sensor stops.
11 Burner flame is extinguished by closing Gas Solenoid Valves.
12 The post purge operation then commences.
13 Once the post-purge operation ends the fan stops.

**Total 10 Marks**

## ANSWER 5

(a) (i)
- With components belonging to the same system.
- Parts permitted with the written approval of the manufacturer. (2 marks)

(ii)
- A manufacturer's label is to be attached adjacent to the meter or LPG cylinders. (2 marks)

(iii)
- Operating pressure exceeding 7 kPa.
- The location of the pipe is not readily identifiable as consumer piping. (2 marks)

(iv)
- Spacings not more than 8 m. (1 mark)

(b) (i)
- Fire control room or in a prominent place. (1 mark)

(ii)
- Detail the location of all emergency manual shut off valves.
- Vermin proof and weather proof. (1 mark)

**Total 9 marks**

## ANSWER 6

(a) Certificate of Compliance
When a new installation has been completed. (2 marks)

(b) Gas Safety Certificate
After work has been completed and connected. (2 marks)

(c) Certificate of Verification
When an existing gas installation has been checked for safety. (2 marks)

**Total 6 Marks**

## ANSWER 7

(a)
- Test points at each appliance (to set operating pressure) and test-point after the supply regugulator (to test/check operating pressures). (1 mark)
- Isolating valves at the water heater and ducted heater only. (2 marks)

(b) Any FOUR (½ mark each)
- 9 kg maximum.
- Approved cylinder connection.
- Cylinder compartment ventilated directly to outside.
- Hose 1 m maximum with no jubilee clips.
- No electrical appliance or source in the cylinder compartment. (2 marks)

**Total 5 Marks**

## ANSWER 8

Any THREE (1 mark each)

- Is large enough for a worker to enter and perform assigned work.
- Has limited entries and exits.
- May contain a hazardous atmosphere, arising from chemicals, sludge or sewage.
- Is constructed so that anyone who enters could be asphyxiated or trapped by walls or floor that converge to a small cross-section, such as a hopper.
- Contains a material, such as sawdust or grain that could engulf anyone who enters.

**Total 3 Marks**

## ANSWER 9

Any FIVE (1 mark each)

- Inform the occupier that the gas supply will be turned off.
- Test the existing installation for leakage.
- Turn the gas supply off.
- Positively identify the pipe.
- Fit an earth bonding strap.
- Purge the pipe.

**Total 5 Marks**

## ANSWER 10

Any THREE (1 mark each)

- Position of power lines.
- Stability of ground.
- Operator of the cherry picker is trained.
- Availability of a suitable harness.

**Total 3 Marks**

## ANSWER 11

Any THREE (1 mark each)

- Fire collars.
- Fire wraps.
- Fire pillows.
- Mastic sealant.
- Fire-proof foams.
- Fire dampers.

**Total 3 Marks**

## ANSWER 12

Any FOUR (1 mark each)

- Appliance requirements/energy input.
- Condensate.
- Terminal location.
- Clearances.
- Laterals.
- Length of flue.
- Material of flue.
- Ventillation.
- Heat loss.

**Total 4 Marks**

## SECTION B

1. C 10 m
2. D 24 months.
3. B 12 months.
4. B 1.2 m
5. A 0.3 $m^3$.
6. D The allowance for a gas taking up less volume while under pressure.
7. C 1.5 kPa.
8. A 40 litres/second.
9. C 20 mm per M.
10. A 10 $m^3$.

**Total 10 Marks**