No. 9193

Plumbers,
Gasfitters and
Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2011

LICENSED GASFITTER

ANSWER SCHEDULE

ANSWER 1

(a)
- To stop down draft blowing on the burner/combustion.
- To allow additional air enter the flue to assist with flue pull and dilution of flue gases.

(2 marks)

(b) Any THREE (1 mark each):
- Wind direction, obstructions near the flue terminal, disturbance of air flow around the flue terminal.
- Negative pressure within the area of the appliance is located. E.g. extraction fans drawing air back down the flue.
- Lack of flue pull/draught from design or by blockage.
- Corroded flue terminal.

(3 marks)

(c)
- To provide air for burner combustion.
- To provide air for burner dilution of flue gases in the down draft diverter/ help with flue pull.
- To keep the cupboard ambient temperature stable.

(3 marks)

Total 8 marks

ANSWER 2

(a)
- Pipework Test: A test of newly installed pipework which has the appliances and gas supply isolated from the test.
- Installation Test: A test of newly installed pipework and appliances which has the appliances connected and gas supply isolated from the test.
- Leakage Test: A test of existing pipework and appliances before work commences with the gas supply isolated from the test.

(1 mark each name, 1 mark each description),

(6 marks)

(b) Any TWO (½ mark each):
- Define the purge area.
- Clear all ignition sources.
- Do not allow smoking or cell phones in the purge area.
- Ensure good ventilation.

(1 mark)

Total 7 marks

ANSWER 3

(a) To rinse condensate from the heat exchanger because it has corrosive properties.

(2 marks)

(b) Any FOUR (1 mark each):

- No Leaks.
- Continual fall.
- Supported well.
- Terminate where it will not damage or annoy.
- Terminate where can be seen.
- Appropriate material.
- Obstruction due to frost. (4 marks)

(c) Any FOUR (1 mark each):

- New Zealand supplier.
- The appliance type (e.g. “heater” is not enough, it has to state if it is Table Top Patio Heater or Patio heater or Cabinet heater).
- The appliance model number.
- The type of gas the appliance is ready to connect to.
- Minimum and maximum gas pressure the appliance is designed to operate on.
- The appliance burner test point pressure.
- Maximum test pressure (if less 7 kPa for NG and 14 kPa for LPG).
- Input Rating in MJ or gas consumption Kg/hour
- The Standard to which the appliance was tested to. (2 marks)

Total 6 marks

ANSWER 4

L Room temperature falls below thermostat set temperature.
D Combustion air fan starts pre purge.
G Combustion chamber pressure switch activates.
E Ignition function commences.
K Gas valve opens at low rate.
F Gas ignites and flame is sensed.
J Gas valve switches to the full rate.
B Room circulation starts.
I Room temperature rises above the thermostat set temperature.
A Gas valve closes.
H Combustion air fan completes a post purge.
C Room air circulation fan turns off once appliance has cooled.

Total 6 marks

ANSWER 5

(a) Any THREE:
- Pipe Size.
- Available pressure.
- New appliance requirements.
- Meter capacity. (3 marks)

(b)
- Leakage/Installation Test.
- Soapy water leak check of any affected connections.
- Set/check high and low/bi-pass pressures.
- Check aeration/burner operation.
- Purge.

(4 marks)

Total 7 marks

ANSWER 6

(a) **Installation Working Pressure**
- The gas pressure that the installation pipework has while all appliances are working/operating.

Appliance Burner Test Point Pressure
- The gas pressure that the appliance burner has while it is working/operating or state.

Static Pressure
- The installation/appliance gas pressure that is read with no appliances working/operating.

(3 marks)

(b)
- The regulator is not locking up/shutting off and is letting by/allowing excess pressure through.
- Temperature or atmospheric conditions.

(2 marks)

Total 5 marks

ANSWER 7

(a) Any FOUR (1 mark each):
- Thermocouple faulty.
- Pilot adjusted/blocked too small.
- Thermocouple not positioned correctly in flame.
- ECO (energy cut off) is open circuit.
- Faulty electromagnet in unitrol. (4 marks)

(b) • Low flame has not been set correctly. (1 mark)

(c) Any TWO (1 mark each):
- Pilot adjusted/blocked too small.
- Burner is blocked particularly near the pilot.
- Gas pressure too low. (2 marks)

Total 7 marks

ANSWER 8

(a) (i) Thermo electric flame failure device. (1 mark)

(ii) A Button/activator.
B Valve.
C Inlet.
D Valve seat.
E Thermo electric magnet.
F Aeration.
G Pilot tube.
H Thermocouple/junction. (4 marks)

(b) (i) Flame recification flame failure device. (1 mark)

(ii) A Inlet.
B Coil.
C Valve.
D Aeration.
E Earth.
F PCB/Controller.
G Burner.
H Flame sense/electrode. (4 marks)

Total 10 marks

ANSWER 9

CO/carbon monoxide poisoning.

Total 1 mark

ANSWER 10

(b) Any ONE:
- If it is plastic coated.
- If protected with a proprietary wrapping. (1 mark)

(c)
- Purged.
- Sealed. (1 mark)

Total 2 marks

ANSWER 11

(a) Rod and Tube.
(b) Liquid/Vapour expansion.
(c) Bimetallic Coil.

Total 3 marks

ANSWER 12

- Disconnect meter and appliances.
- Use air or inert gas.
- Test installation afterwards.

Total 2 marks

ANSWER 13

Any TWO:

- Identify when a gas leak occurs.
- Identify the gas.
- The gases are naturally scentless.

Total 2 marks

ANSWER 14

ANSWER 15

(a) • To help stop the flame from lifting off the burner (to keep the flame stable). (1 mark)

(b) • Flame retention holes/ports.
• Flame retention rings.
• Flame retention shield/cover.

Total 3 marks

ANSWER 16

(a) 7 x 40 = 280MJ/h (½ mark)
280 ÷ 90 = 3.11 m^3/h (½ mark)

(b) 280 ÷ 54 = 5.185 (½ mark)
6 x 2 = 12 (½ mark)

(c) 7 x 10 = 70 (½ mark)
3.11 x 25 = 77.75 (½ mark)
Additional 7.75 m^3 (1 mark)

Total 4 marks

ANSWER 17

(a) 0.05 × 0.05 × 0.7854 15.5 (½ mark)
= 0.0304 m^3 (½ mark)

0.03 × 0.03 × 0.7854 × 18 (½ mark)
= 0.0127 m^3 (½ mark)

Total = 0.0431 m^3 (½ mark)

(b) 40 × 0.54 m^3 of gas
= 21.6MJ (½ mark)

Total 3 marks

SECTION B

1. B 300mm.
2. B 300mm.
3. E NZS 3501.
4. E 1,000 mm.
5. B They must be used as a complete entity as per the manufacturer's instruction.
6. B They must be free of damage and defects before it is reused in an installation.
7. E 1.0 mm.
8. D BS08C35 (buff).
9. C They must not be installed if the operating pressure of the installation is greater than 7kPa.
10. D 3 m.
11. A NZS 5258.
12. C 500 mm.
13. B Space heater.
14. D 1000 mm.
15. A Not less than 200 mm.
16. E Not less than 900 mm.
17. A 0.03 m^3.
18. D A temperature dependant resistor.
19. A The burner injector size is correct.
20. D Carbon dioxide.

Total 20 marks