No. 9196

Plumbers, Gasfitters and Drainlayers Board

REGISTRATION EXAMINATION, JUNE 2017

CERTIFYING GASFITTER

ANSWER SCHEDULE

ANSWER 1

(a)
- To provide ventilation.
- To prevent external moisture being accumulated or transferred. (2 marks)

(b) (i)
- Fire resistance.
- Bracing.
- Sound proofing.
- Wet lining. (2 marks)

(ii)
- Colour of the board.
- Labels/stamping/thickness. (2 marks)

Total 6 Marks

ANSWER 2

(a) Any THREE (1 mark each)
- Position of power lines.
- Suitability of surrounding ground.
- Operator of the cherry picker is trained.
- Availability of a suitable harness. (3 marks)

(b)
- Advise the owner or occupier.
- Advise the Secretary of Energy/Energy Safety Service. (2 marks)

Total 5 Marks

ANSWER 3

Supply Pressure	2.42 kPa (1 mark)
Length of Longest Run	6.5 m – 7.5 m (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)

Pipe section	MJ/h	Diameter (mm)	Pipe section	MJ/h	Diameter (mm)
A - B	1135.5 (½ mark)	40 (½ mark)	I - K	196 (½ mark)	20 (½ mark)
B - C	210 (½ mark)	25 (½ mark)	H - L	451.5 (½ mark)	32 (½ mark)
C - D	60 (½ mark)	15 (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)	40 (½ mark)	N - O	31.5 (½ mark)	10 (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 (½ mark)
I - J	128 (½ mark)	20 (½ mark)			

Total 21 Marks

ANSWER 4

(3.142) × 12.5 x 12.5 = 490.93 (1 mark)
490.93 + 490.93 = 981.86 (1 mark)
981.86 ÷ (3.142) = 312.49 (1 mark)
Square root of 312.49 = 17.67 (1 mark)
Radius = 17.67 mm. Diameter = 35.34 mm. Minimum diameter 40 mm. (1 mark)

Total 5 Marks

ANSWER 5

Appliance	Daily operating time	Consumption (m^3/day)
Natural gas, package burner 95 kW	8 hours	68.4
LPG, cooker 140 MJ/h	3 hours	4.6
Natural gas, furnace 113,750 BTU	5 hours	15
Natural gas, space heater 35 MJ/h	4 hours	3.5

Total 4 marks

ANSWER 6

(a) Figure (i) the same size as the vent outlet connection on the regulator. (1 mark)

Figure (ii) one pipe size larger than the vent outlet connection on the regulator. (1 mark)

(b) 1 Orifice
To allow a greater flow for less differential pressure

2 Spring
To provide greater resistance to valve movement (4 marks)

Total 6 Marks

ANSWER 7

(a) (i) 26 000 BTU = 27.43 MJ (1 mark)
Code references: 650, 610 (1 mark)
From the code
Area = (610 × 27.43) + (650 × no. of occupants) (1 mark)
= (610 × 27.43) + (650 × 4)
= 19332.3 mm^2 (1 mark)

(ii) Height = area/width = 19332.3/300
= 64.4 mm (1 mark)

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

- Behind the appliance
- Vented to outside
- One above the absorption fins
- One at low level (2 marks)

(ii) 32 500 mm^2 (1 mark)

Total 8 Marks

ANSWER 8

180 litres of water has mass 180 kg

Temp. diff. = 70 - 18 = 52ºC

45 MJ/h = 45 000 kJ/h

$$\text{Heating time} = \frac{\text{mass of water} \times 4.2 \times \text{temp. diff.}}{\text{heat energy input per hour} \times \text{efficiency} \times 100}$$

$$= \frac{180 \times 4.2 \times 52 \times 100}{45\,000 \times 78}$$

= 1.12 hours

= 67 minutes

Total 6 Marks

ANSWER 9

(a)

Flue Section	Minimum Size
A	125 mm
B	125 mm
C	100 mm
D	75 mm
E	75 mm

(5 marks)

(b) Any FOUR (½ mark each)

- Insulate flue.
- Protect flue from exposed area.
- Select shortest route to atmosphere.
- Avoid offsets/avoid lateral runs.
- Increase flow with greater dilution.
- Use appropriate material for the flue. (2 marks)

Total 7 Marks

ANSWER 10

(a) 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.

(3 marks)

(b)

Description of work	Notifiable Work Y/N
Working in an area where the temperature exceeds 45ºC	N
Working in a confined space	N
Working on a scaffold which is over 5 metres high	Y
A trench which is 2 metres deep and 4 metres wide at the top	N
Work on the roof of a 2 storey residential building which is 6 metres high.	N
Work in which a person wears a face mask with filter canisters	N
Using a 3.5 meter high mobile scaffold on a commercial site	N
Working on a residential property which is known to contain asbestos containing materials	N

(½ mark each, 4 marks)

Total 9 Marks

ANSWER 11

(a) Any SIX (1 mark each)

- That the work has been done lawfully and safely, and the information on the certificate is correct.
- That the work has been done in accordance with means of compliance in AS/NZS 5601 Part 1 or 2.
- Whether the work has been done in accordance with the certified design for the gas installation.
- Which other Standards were complied with (if this was required).
- Whether the work done relied on any manufacturer's instructions.
- The type of gas the installation is safe to connect to.
- The gas pressure that the installation is safe to connect to.
- Which parts of the installation, if any, are safe to connect to a gas supply.
- The location of the gas installation.
- Describe the work done and who did what, if different work was done by different people
- The name and registration number of the person issuing the certificate.
- The name and registration number of any other person who did any of the gasfitting work under supervision.
- The date(s) on which the work was done.
- Be signed and dated by the person issuing the certificate.
- Display the Authentication Mark.

include a copy or reference to the manufacturer's instructions and certified design used for the work. This may be a reference to where the documents can be found by electronic means (e.g. a website).

(6 marks)

(b)
- Complete a Gas Safety Certificate (GSC).
- Instruct the owner.
- Lodge an entry into the high rise database. (2 marks)

Total 9 Marks

ANSWER 12

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

(b)
- Spacings not more than 8 mm. (1 mark)

(c)
- Where the operating pressure exceeds 7 kPa. (1 mark)

(d)
- The piping must have a quarter turn, manual shut off vavle for each occupancy
- The valves must be accessable, and where practicable, external to the occupancy.
- A durable permanent sign must be located adjacent to each valve, with the wording GAS VALVE.

(3 marks)

Total 7 Marks

SECTION B

1.	E	2.0 m.
2.	D	7.0 kPa.
3.	C	20 mm per m.
4.	D	450 mm.
5.	B	6 mm.
6.	C	440°C.
7.	D	50 MJ/h.
8.	A	20 litres/second.
9.	E	6.
10.	B	50 mm.

Total 10 Marks