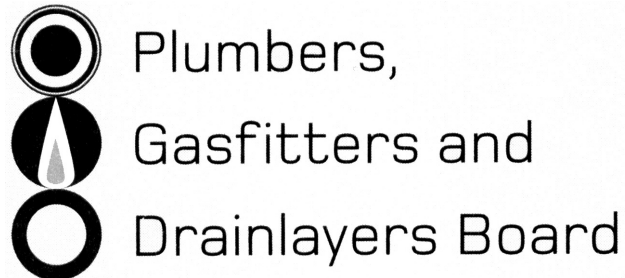


No. 9195



REGISTRATION EXAMINATION, JUNE 2013
CERTIFYING PLUMBER

ANSWER SCHEDULE

ANSWER 1

(i) 3 months (1 mark)

(ii) A fine (not exceeding \$500) (1 mark)

Total 2 marks

ANSWER 2

(a) Drawing to show hot water pipework feeding all required fixtures.

Location of pump if required.

Location of tempering valves to suit.

Location of legionella bacteria protection if required.

Location of isolating valves.

(4 marks)

(b) Total storage required = $\frac{\text{Time (seconds)} \times \text{Flow rate (l/s)} \times \text{number of showers} \times T_1}{T_2 \times \text{Peak load}}$

$$\text{Storage} = \frac{570 \times 0.1 \times 10 \times 25}{55 \times 80\%} \quad (2 \text{ marks})$$

$$= \frac{14250}{44} \quad (1 \text{ mark})$$

$$\text{Storage} = 323.86 \text{ litres} \quad (1 \text{ mark})$$

$$\text{Capacity of each cylinder } 323.86 \div 2 = 161.93 \text{ litres} \quad (1 \text{ mark})$$

(5 marks)

(c) (i) Drawing to show cylinders connected in parallel.

(2 marks)

(ii) Better flow rates achievable.

All cylinders share the work evenly.

Any unit can be isolated for maintenance with disrupting supply.

(3 marks)

- (c) (iii) Nny THREE (1 mark each)
- Supported on a platform of hardwood or other suitable material.
 - Supported by one or more load bearing walls.
 - Where sited over one wall only, the cylinder must be placed centrally over the wall.
 - The load must not be carried by ceiling joists, unless ceiling joist are directly above a wall.
 - If the load bearing wall is supported by piers the water heater should be located centrally above the pier.
 - The load should not be carried by trusses unless they have been specifically designed for the weight.
 - The cylinder must be seismically restrained.

(3 marks)

(d) Any ONE (1 mark):

- Installing a UV filter on a tempered ring main.
- Running the ring main with untempered water and tempering at each outlet.

(1 mark)

Total 18 marks

ANSWER 3

$$3 \times 3.6 \text{ KW} = 10.8\text{mJ}$$

$$10.8\text{mJ} \times 1000 = 108000 \text{ kJ} \text{ (1 mark)}$$

$$\text{Time} = \frac{750 \times 4.2 \times (70 - 40)}{108000 \times 0.94} \text{ (1 mark)}$$

$$= \frac{94500}{10152} \text{ (1 mark)}$$

$$= 9.31 \text{ hours (1 mark)}$$

Total 4 marks

ANSWER 4

(a) Any THREE (1 mark each)

- Any condition that amounts to or results in permanent loss of bodily function, or temporary severe loss of bodily function. (See HSE ACT Schedule 1 pg 79 for example injuries.)
- Amputation of body part.
- Burns requiring referral to a specialist medical practitioner or specialist outpatient clinic.
- Loss of consciousness from lack of oxygen.
- Loss of consciousness, or acute illness requiring treatment by a medical practitioner, from absorption, inhalation, or ingestion, of any substance.
- Any harm that causes the person harmed to be hospitalised for a period of 48 hours or more commencing within 7 days of the harm's occurrence.

(3 marks)

- (b) Department of Labour (1 mark)
- (c) 7 days (1 mark)
- (d) Any THREE (1 mark each)
- when authorised to do so by an inspector
 - to save the life of person
 - prevent harm to a person
 - or relieve the suffering of any person
 - to maintain the access of the general public to an essential service or utility; or
 - to prevent serious damage to or serious loss of property.

(3 marks)

Total 8 marks

ANSWER 5

- (a) Drawing to show correct vent locations and sizes for fully vented system. (7 marks)

(b) Total discharge loading for the stack	80
The maximum discharge loading allowable for any one floor level	125
Minimum diameter at point A	100 mm
Minimum diameter at point B	100 mm
Minimum diameter at point C	80 mm
Minimum height of prohibited connection –section D	600 mm
Minimum length of prohibited connection – section E	450 mm
Minimum length of section prohibited connection – section F	2500 mm
Minimum height of prohibited connection – section G	600 mm
Minimum diameter at point H	40 mm
Minimum diameter at point I	65 mm
Minimum diameter at point J	65 mm

(12 marks)

- (c) 26 l/s (1 mark)

Total 20 marks

ANSWER 6

(a) Any THREE(1 mark each)

- The space is big enough for a worker to enter to complete a task
- The space has limited entries and exits
- The space may contain a hazardous atmosphere (for example sewer gases or welding fumes etc).
- The space is constructed in a way that restricts airflow and may result in the worker running out of oxygen or becoming trapped due to the space getting smaller the further the worker enters.
- The space contains a material that could engulf the worker (sawdust or grain) and become either a breathing or fire hazard.

(3 marks)

(b) The primary contractor

(1 mark)

Total 4 marks

ANSWER 7

- Drawing to show
- Cross-sectional hollow wall with penetration
- Sleeve
- Both sides of the wall protected
- Collar/plastic/sealant

(4 marks)

Total 4 marks

ANSWER 8

(a) Any THREE (1 mark each)

- Protected from the effects of corrosive or toxic environments, and
- Protected from damage
- Have free ventilation to the atmosphere for the relief valve outlet at all times,
- Be located in an area that is not subject to ponding,
- Have the relief drain outlet located not less than 300 mm above the surrounding surface, and
- In an accessible position for maintenance and testing to AS 2845.3 or NZ backflow testing standard.
- As near as practicable to the potential source of contamination, and

(3 marks)

(b) (1 mark each)

Reduced Pressure Zone Device

Pressure Vacuum Breaker

Double check valve

(3 marks)

Total 6 marks

ANSWER 9

Any THREE (1 mark each)

- At all bends or junctions
- At the termination of piping (dead ends)
- At valves installed in the piping
- At any reducing fittings in the direction of the smaller pipe
- At changes of direction in excess of 5°
- At grades in excess of 1:5
- In accordance with manufacturer's instructions

Total 3 marks

ANSWER 10

(a) Finding correct section of AS/NZS3500 Part 1: Water services (1 mark)

Section	Diameter
A – B	65 mm
B – C	65 mm
C – D	65 mm
E – F	50 mm
G – H	40 mm

(6 marks)

- (b) Finding correct values in AS/NZS3500 Part 1: Water services. (1 mark)
- 28 × WC @ 45 litres each = 1260 (1 mark)
- 11 × Urinals @ 30 litres each = 330 (1 mark)
- Capacity = 1260 + 330 = 1590 litres (1 mark)

(4 marks)

Total 10 marks

ANSWER 11

- (a) • Filled with water to either the spill level of the highest fixture or the flood level of the lowest sanitary fixture whichever is the highest. Not to exceed 3 metres.
• Water level must be maintained without leakage for minimum of 15 minutes. (2 marks)
- (b) 75mm (1 mark)
- (c) Any THREE (1 mark each)
- The pipes are positioned according to the plan.
 - The pipes should be crimped or capped to prevent debris entering the pipe.
 - The pipe should be lagged and/sleeved to prevent contact with the concrete and provide room for expansion.
 - The pipe should supported to ensure it will exit the slab at a 90° angle to the surface of the slab.
 - Pipe hydrostatically tested.
 - The pipework has been tested/inspected (3 marks)

Total 6 marks

SECTION B

1. D 86 mm
2. C The expected wind speed in the area
3. D 110 mm
4. D 300 mm
5. B 25 mm
6. E Slop hoppers
7. C A pump
8. E Heat that is circulated through air or liquid due to differing densities.
9. D Heat that can travel through a vacuum.
10. A Heat that is transferred molecule to molecule by direct contact.
11. A Purple.
12. B 300 mm
13. A 150 mm
14. C 40 mm
15. E 2000 mm

Total 15 marks