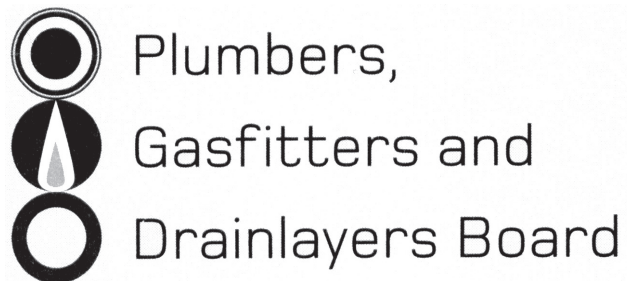


No. 9192



REGISTRATION EXAMINATION, NOVEMBER 2010
LICENSED PLUMBER

ANSWER SCHEDULE

ANSWER 1

(a) Hard water (1 mark)

(b) Complaint (1 mark)

Any ONE – (1 mark)

- Soap not lathering
- Staining
- Calcium deposits

Remedy (1 mark)

Any ONE – (1 mark)

- Water conditioner.
- Water softener
- Ion exchangers
- Heating water above 70°C

Total 3 marks

ANSWER 2

Any TWO (½ mark each)

- Internal bending spring is used
- Anneal the copper tube beforehand.
- Sand

Total 1 mark

ANSWER 3

Any ONE – (1 mark)

(a)

- Dissimilar metals
- electrolysis
- galvanic cell action

 (1 mark)

(b) The copper will corrode, corrosion (1 mark)

Total 2 marks

ANSWER 4

The copper can become fatigued/work hardened causing it to fracture or split

Total 1 mark

ANSWER 5

- (a) Electrical earth continuity would be severed, creating a possible risk of electric shock (1 mark)
- (b) Connect a permanent bonding strap joining both ends of the metal pipe (1 mark)
- Total 2 marks**

ANSWER 6

State the definition of the following terms

- (a) Hydrostatic – is water/fluid at rest, not moving (1 mark)
- (b) Hydraulics – is water/fluid moving (1 mark)
- (c) Velocity – Quantity measured in meters per second, Speed (1 mark)
- (d) Erosion – Transporting (wearing away) of solids (1 mark)
- Total 4 marks**

ANSWER 7

Any FIVE – (1 mark each)

- The scaffold is firm with braces fitted correctly
- The mobile scaffold is set up on firm level ground
- All wheels on the scaffold are locked with the wheels are turned out
- The decking on the scaffold is fully planked out and secure
- Access is from a ladder within the frames of the scaffold never climb up the outside
- Scaffold does not exceed the height restriction (the scaffold should be no higher than 3× the width of the base and 1.5× the length of the base at the narrowest point)
- Check for overhead power lines
- Another means of fall prevention (such as a safety harness) is used where guardrails can't be fitted.
- Use kick guards/toe boards.

Total 5 marks

ANSWER 8

$$\begin{aligned} &= 25 \times 0.0000166 \times (59 - 15) && \text{(substitution 1 mark)} \\ &= 25 \times 0.0000166 \times 44 && \text{(calculation 1 mark)} \\ &= 0.01826 \text{ m} && \text{(conversion 1 mark)} \\ \text{ANSWER} &= 18.26 \text{ mm} && \text{(1 mark)} \end{aligned}$$

Total 4 marks

ANSWER 9

$$3.5 \times 9.81 = 34.335 \text{ kPa}$$

Calculation/answer

(Process 1 mark)

(1 mark)

Total 2 marks

ANSWER 10

(a) Floor Waste – for accidental overflow or cleaning wash down.

(1 mark)

(b) 1 To receive discharge from sanitary fixtures

2 To receive accidental spillage

(2 marks)

Total 3 marks

ANSWER 11

3 Metres

Total 1 mark

ANSWER 12

Drawing

(1 mark)

Correct hot tempered lines

(1 mark)

Correct hot un-tempered lines

(1 mark)

Correct cold lines

(1 mark)

Pipe work labelled

(1 mark)

Total 5 marks

ANSWER 13

(a) Drawing to include:

– Primary heat source

– Heat exchanger

– Secondary heated system

No heat exchange system: 0 marks

(3 marks)

(b) The primary heat source heats a fluid contained within a coil. This coil of hot fluid radiates the heat to the secondary system. The fluid within the coil does not come into contact with the fluid in the secondary system

(2 marks)

Total 5 marks

ANSWER 14

- (a) The first check valve is fouled/faulty. The excess pressure is relieved from the reduced pressure zone. (2 marks)
- (b) The second check valve is fouled. Supply pressure has dropped. Any downstream excess pressure is relieved before it can enter the water main. (2 marks)
- (c) Normal operation with water flowing. Check valve one and check valve two are both open, reduced pressure zone not relieving. (2 marks)

Total 6 marks

ANSWER 15

- (a) (i) High (1 mark)
(ii) Low (1 mark)
(iii) Medium (1 mark)
- (b) In a toxic environment (1 mark)
- (c) • As close as practicable to the potential source of contamination (1 mark)
• In an accessible position for maintenance and testing (1 mark)

Total 6 marks

ANSWER 16

Self-siphonage: Flowing water tends to cause air to move with it. The more rapid the flow of water from a sanitary fixture into the pipe, the nearer to the full bore will be the flow in this pipe. If water does flow full bore in the pipe, air in the pipe will be driven before it. This air movement reduces air pressure in the pipe between the trap seal and the flow. If this situation is great enough, atmospheric pressure in the room will force the water out of the trap seal.

(2 marks)

Induced siphonage: When water flows down a vertical pipe, it forms a vortex and the water spirals down the wall of the pipe. The water flowing past a lower branch pipe reduces the pressure in the lower pipe to lower than the atmospheric pressure in the lower room. The atmospheric pressure differential will force the seal to siphon from the lower pipe trap.

(2 marks)

Compression: A discharge flowing full bore in a less graded section of a combined waste pipe if followed closely by a faster full bore discharge down a vertical section will cause air and gases between the two discharges to compress. This causes the water seal in any fixture trap in between to be forced back into the fixture allowing foul gases to enter the room.

(2 marks)

Momentum: When a trap is fitted some distance from a sanitary fixture, the falling discharge gains momentum which can force the water seal over the trap resulting in a reduction or total loss of water seal.

(2 marks)

Oscillation: Depending on the location of the termination point of a vent pipe, wind gusts can cause a variation in the air pressure within the pipe. The result is a rising and falling action of the water seal in the trap, which may lead to trap seal loss.

(2 marks)

Total 10 marks

ANSWER 17

- Within 1.5 m of the crown of the trap
- Not less than 300 mm above any bend at the base of the vertical drop

Total 2 marks

ANSWER 18

- (a)
1. The valve must be within 2 m of the cylinder outlet
 2. The tempering valve must be 25 mm
 3. The tempered line to the shower must be 20 mm

(3 marks)

- (b) 1 metre from the outlet

(1 mark)

Total 4 marks

ANSWER 19

Any THREE – (1 mark each)

Height difference between water supply level and pump

Height difference pump and outlet

Pressure required

Flow rate required

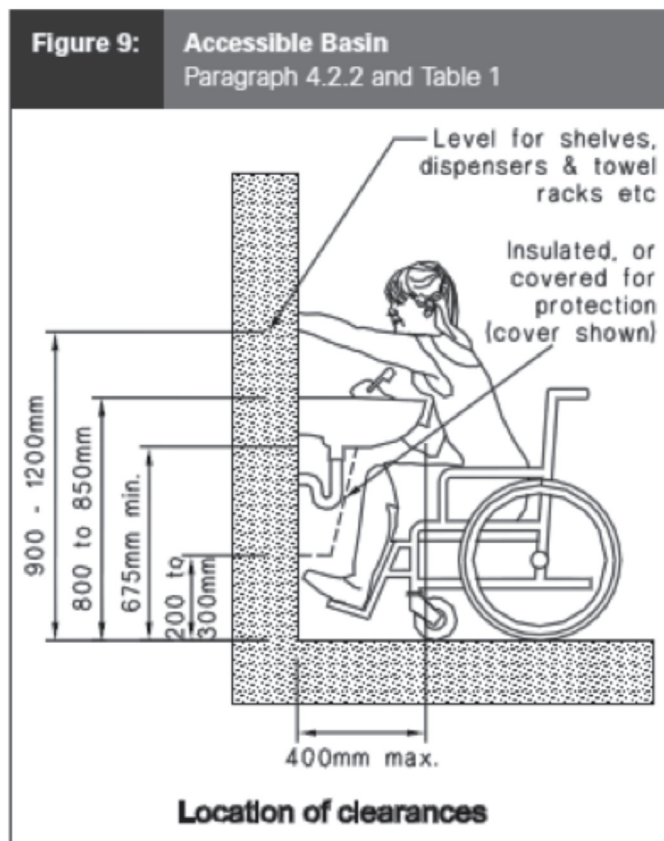
Pipe diameter

Total 3 marks

ANSWER 20

Any THREE – (1 mark each)

300 mm from front of WC pan to side of basin



Total 3 marks

ANSWER 21

(a) 50 mm

(1 mark)

(b) Any THREE – (1 mark each)

- The system must always have one open vent to atmosphere.
- They must be located in an accessible position.
- No smaller than the diameter of the vent pipe that it serves.
- Where the valve is unlikely to become frozen.
- Where it is protected from damage.
- Where adequate air can enter the valve.
- Must be installed upright (vertically).
- Not to be used as the main vent.

(3 marks)

Total 4 marks

SECTION B

1. D 50 litres.
2. C 45°C.
3. C At the basin tap outlet.
4. B 300 mm.
5. B 20 mm.
6. C 25 mm.
7. A 15 minutes at 1500 kPa.
8. D 60°C.
9. D 600 mm.
10. E 50 years.
11. C 50 mm.
12. D 50 mm.
13. C To prevent the loss of water seals.
14. A 3.5 m.
15. C To prevent foul gases entering the building.
16. A A sanitary fixture.
17. D 40 mm.
18. C 80 mm.
19. D 1 in 40.
20. D On the left side of the cold tap.
21. E 400 mm.
22. C A valve that delivers water at a set temperature.
23. B noisy flame with a pointed, blue inner cone.
24. C Spirits of salt.

Total 24 marks

