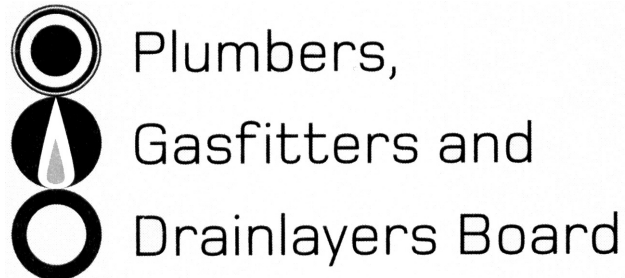


No. 9192



REGISTRATION EXAMINATION, JUNE 2011
LICENSED PLUMBER

ANSWER SCHEDULE

ANSWER 1

- (a) Grey water – Water that has been used for sanitation but does not include any human waste (e.g. Baths, showers, laundry.) or waste water. (1 mark)
- (b) Black water – Water that contains human waste. (1 mark)
- (c) Potable water – Clean drinking quality water. (1 mark)
- (d) Surface water – Water – rain or from a pond or river – which flows over the earth's surface. (1 mark)
- Total 4 marks**

ANSWER 2

- (a) Low pressure – valve vented (1 mark)
- (b) A Name: Isolating valve
Function: Turns the water supply on and off.
- B Name: Filter/strainer
Function: Removes any particles that may be present in the water supply to protect downstream components.
- C Name: Non-return valve
Function: Prevents water from returning to the supply pipework from the cylinder.
- D Name: Pressure reducing valve
Function: Reduces supply pressure to match the working pressure of the other components in the system.
- E Name: Cold water expansion valve
Function: Relieves pressure from the system due to thermal expansion.
- F Name: Tempering valve
Function: Mixes hot and cold water to a safe temperature for fixtures used for personal sanitation.
- G Name: Pressure relief valve/pressure vacuum valve
Function: Relieves hot water if pressure within system becomes too high and prevents a vacuum when the cylinder is emptied.
- H Name: Tundish
Function: (Any TWO, ½ mark each)
Prevents a vacuum occurring within the drain pipe siphoning contents of cylinder.
Also provides an overflow point in the event of the drain pipe becoming blocked.
Provides air gap if drain is connected to a sanitary system.

(½ mark each name, 1 mark each function), (12 marks)

Total 13 marks

ANSWER 3

(a) Any THREE:

- Cistern with needle valve.
- Cistern with electronic sensor and solenoid valve.
- Electronic/automatic flushing valve – solenoid with timer (no cistern).
- Solenoid with infra-red sensor.
- Manual flushing valve.
- Water flow sensing valve.

(3 marks)

(b) Any TWO:

- The entire surface of the urinal must be cleaned/covered by the flush of water.
- The system must incorporate a method of backflow prevention.
- Must deliver a minimum of 2.5 litres of water per flush to each stall, bowl or 600 mm length of urinal wall.

(2 marks)

Total 5 marks

ANSWER 4

(a) (i) Any FOUR (½ mark each):

- Fittings.
- Number of valves.
- Internal pipe surface.
- Internal diameter of pipe surface.
- Length of pipe.

(2 marks)

(ii) Any TWO:

Noise.

Reduced Flow.

Reduced Pressure.

(2 marks)

(b) (i) Any ONE:

- Galvanic cell action
- Electrolytic Corrosion

(1 mark)

(ii) Any ONE:

- Corrosion of the galvanised iron pipe
- Dezincification of brass fittings.

(1 mark)

Total 7 marks

ANSWER 5

- (a) Any THREE:
- Overloaded circuits.
 - Flexible extension cords being damaged by sharp edges.
 - Electrical equipment being used in wet conditions.
 - Tripping.
 - Traffic. (3 marks)
- (b) Any TWO:
- An isolating transformer with a voltage between conductors not exceeding 230 volts.
 - A earth circuit that is monitored – if it is broken or disconnected, the power to the appliance will automatically be disconnected.
 - A source to earth connection so that the earth voltage does not exceed 55 volts.
 - A residual current device (RCD). (2 marks)
- (c) Any FOUR:
- ENSURE YOUR SAFETY. DO NOT approach a patient if they may still be connected to electricity.
 - Turn off power supply.
 - Call 111 for an ambulance if they are unconscious or are injured or unwell.
 - If they are unconscious and not breathing, place them on their back and start CPR.
 - If they are unconscious and breathing place them on their side.
 - If conscious, check for injuries or burns (see tips on burns).
 - Warn others in the area.
 - Notify the Department of Labour if required. (4 marks)
- Total 9 marks**

ANSWER 6

- (a) • Diameter of discharge pipe.
• Discharge unit loading of discharge pipe. (2 marks)
- (b) (i) • Kitchen sink
• Laundry sink
• Basin (3 marks)
- (ii) 1.2 metres (1 mark)
- Total 6 marks**

ANSWER 7

(a) Any FOUR:

- Gas flow rate.
- Wire speed.
- Voltage output of machine.
- Angle of handpiece.
- Speed of travel.

(4 marks)

(b) Type (Any ONE):

- Inert.
- Argon.
- Argoshield.
- CO₂ mix.

Reason: It is a non-reactive/non-flammable/inert gas which shields the weld from oxidising and becoming contaminated by impurities in the air.

(2 marks)

(c) Any FOUR:

- UV Burns to skin.
- Hot metal burns.
- Eye damage – arc eye.
- Electric shock.
- Respiratory problems.

(2 marks)

Total 8 marks

ANSWER 8

(a) Heat from the fire causes the vial or link to break allowing the plug to dislodge and water to flow. The water is then deflected by the plate to cover the area.

(2 marks)

(b) ONE of:

- To provide cover for all areas of the building.
- To prevent water from one sprinkler head cooling an adjacent sprinkler head.

(2 marks)

Total 4 marks

ANSWER 9

5.0 metres (in any direction).

Total 1 mark

ANSWER 10

- (a) Drawing to include:
- Inlet
 - Outlet
 - Valve
 - ValveSeat
 - Diaphragm
 - Adjusting screw
 - Adjusting spring
- (7 marks)
- (b) When a tap is opened, the downstream pressure on the diaphragm drops and the inlet pressure can then push the washer off the valve seat and water flows through the valve.
The tension on the spring regulates the pressure required to open the valve, keeping the outlet pressure constant.
When the tap is closed the pressure increases downstream from the valve until that pressure is enough to close the valve against the inlet pressure and the spring tension.
This is achievable as the downstream pressure is acting on the larger area of the diaphragm whilst the inlet pressure is acting on the much smaller area of the valve washer.
- (6 marks)
- Total 13 marks**

ANSWER 11

- (a) Relative humidity is a measure of the amount of moisture in the air. (1 mark)
- (b) It is calculated as the amount of water in the air as a percentage of the amount of water the air is capable of holding at any given temperature.
- (3 mark)
- Total 4 marks**

ANSWER 12

- (a) $V = 6.5 \times 1.75 \times 1.25$ (1 mark)
 $V = 14.21875$ (1 mark)
 $C = 14.21875 \times 80\%$
 $C = 11.375 \text{ m}^3$ (1 mark)
- (3 marks)
- (b) Weight = Volume in $\text{m}^3 \times 1000$
Weight = 11.375×1000
Weight = 11375 (1 mark)
- Total 4 marks**

ANSWER 13

- (a) Any TWO:
- Inlet supply pressure.
 - Hot water cylinder working pressure rating.
 - Cold water expansion valve pressure rating.
 - Inlet flow rate.
 - Diameter of valve connection. (2 marks)
- (b) (i) A hot water cylinder that is designed to provide heated water to the draw off point on the cylinder quicker than standard models. (1 mark)
- (ii) An extra element installed in the cylinder near the top of the cylinder.
A tube inside the cylinder that directs heated water from around the element directly to the top of the cylinder.

(2 marks)

Total 5 marks

SECTION B

1. C When the drain terminates outside the building.
2. B 1:4
3. C 1.000 metres.
4. D 64 mm.
5. A To prevent trap seal loss due to compression.
6. E The discharge from an adjacent fixture on a branch discharge pipe runs full bore and pressure differences causes the water to drain out of another fixture.
7. A The ambient temperature within the room causes the trap seal to be lost into the atmosphere.
8. E Air movement over the vent terminal causes the water seal to spill over the trap weir.
9. C 1.800 m.
10. C A vent that is connected to a discharge pipe before the last fixture.
11. A 20 mm.
12. D 80 mm.
13. D 5.
14. E 50 mm.
15. D Lead.
16. A Copper.
17. B Electrofusion.
18. D A solar water heater which uses a heat transfer fluid to heat water that is circulated through a radiator system.
19. B Condenser, compressor and heat exchanger.
20. B An air conditioner in which the two main components are installed in separate areas.

Total 20 marks