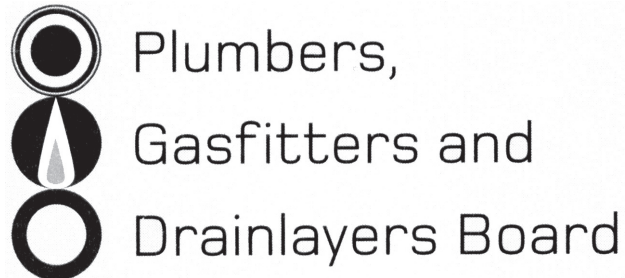


No. 9192



REGISTRATION EXAMINATION, JUNE 2016
LICENSED PLUMBER

ANSWER SCHEDULE

ANSWER 1

- (a) Only one trap used
All fixtures connected to inlet of trap
Fixtures have fall to trap inlet
Dishwasher outlet rises before connection to prevent siphon (3 marks)
- (b) 50 mm (1 mark)
- Total 4 marks**

ANSWER 2

- Any FIVE (1 mark each)
- Thermostat broken
Element worn out
Pressure reducing valve faulty
Relief valve faulty
Hot water pipe in dwelling broken
Tempering valve faulty
Power turned off/fuse blown
- Total 5 marks**

ANSWER 3

- (a) (i) The discharge from a single fixture runs at full bore, creating a negative pressure zone behind the discharge which pulls the water out of the trap and down the discharge pipe. (2 marks)
- (ii) A piece of hair or other matter is caught over the weir, with one end below the water level in the trap. The water in the trap travels along this piece of matter, over the weir and drips down the discharge pipe, lowering the depth of the water seal. (2 marks)
- (iii) Wind moving over the terminal of the vent pipe causes the pressure within the pipework to fluctuate. The fluctuating pressure causes the water seal to rock, allowing water to flow over the weir of the trap and lowers the depth of the water seal. (2 marks)
- (b) Any THREE (1 mark each)
- Evaporation
Momentum
Induced siphonage
Leaks
Compression (3 marks)
- Total 9 marks**

ANSWER 4

Drawing to show each fixture and the room to scale and correctly located.

Total 5 marks

ANSWER 5

- (a) (i) The negative pressure overcomes the spring pressure and pulls the valve off the seat allowing air to enter the pipe and equalise the pressure. (2 marks)
- (ii) The water seal will remain intact in the trap as the pressure on both sides of the seal and equal. (1 mark)
- (b) (i) The air admittance valve will remain closed and prevent foul air escaping through the valve. (2 marks)
- (ii) The pressure may break the water seal in the trap. (1 mark)

Total 6 marks

ANSWER 6

- (a) (i) Any FOUR (½ mark each)
- Burns
 - Radiation
 - Electrocution/electric shock
 - Fumes
 - Tripping over cables
 - Arc eye
- (2 marks)
- (ii) Any SIX (½ mark each)
- Gloves
 - Overalls
 - Eye protection/Safety glasses/Full face safety helmet
 - Leather apron
 - Boots
 - Spats/gaiters
 - Breathing apparatus
- (3 marks)
- (b) (i) Any TWO (½ mark each)
- Lack of oxygen
 - Poisonous gases
 - High temperature
 - Dust
- (1 mark)

- (ii) Any TWO (½ mark each)
 - Breathing apparatus
 - Ventilation
 - Air supply

(2 mark)

Total 8 marks

ANSWER 7

- (a) uPVC
 - Polybutylene
 - Polyethylene
 - Polypropylene

(2 marks)

- (b) Any THREE (1 mark each)
 - Crimp
 - Mechanical
 - Solvent cement
 - Fusion weld
 - Compression
 - Threading
 - Sliding sleeve
 - Electro-fusion

(2 marks)

Total 4 marks

ANSWER 8

- (a) (i) Unit of measure for the discharge in a plumbing system.

(1 mark)

- (ii) Rate
 - Duration
 - Frequency

(1 mark)

(b)

Items	Discharge unit rating
WC pan	4
Dishwasher (domestic)	3
Wall-hung urinal	1
Double laundry tub	5
Commercial kitchen sink	3
Bath	4

(3 marks)

Total 5 marks

ANSWER 9

- (a) (i) Has the potential to cause death (1 mark)
- (ii) Autoclaves and sterilisers
Systems containing chemicals such as anti-freeze, anti-corrosion, biocides, or fungicides
Beauty salon and hairdressing sinks
Boiler, chiller and cooling tower make-up water
Car and factory washing facilities
Chemical dispensers
Chemical injectors
Chlorinators
Dental equipment
Direct heat exchangers
Fire sprinkler systems and fire hydrant systems that use toxic or hazardous water (3 marks)
- (b) (i) Has the potential to injure or endanger health (1 mark)
- (ii) Appliances, vehicles or equipment
Auxiliary water supplies such as pumped and non-pumped fire sprinkler secondary water
Deionised water, reverse osmosis units and equipment cooling without chemicals
Fire sprinkler systems and building hydrant systems
Hose taps and fire hose reels associated with Medium hazard
Irrigation systems with underground controllers
Irrigation without chemicals
Livestock water supply without added chemicals
Untreated water storage tanks
Water and steam cleaning
Water for equipment cooling
Drink dispensers with carbonators
Swimming pools, spas and fountains (2 marks)
- (c) (i) Has the potential to cause a nuisance (1 mark)
- (ii) Drink dispensers (uncarbonated) (1 mark)
- (d) Any THREE (1 mark each)
Campylobacteriosis
Gastroenteritis
Cryptosporidium
Giardiasis
Legionnaire's disease
Colitis
Salmonella (3 marks)

Total 12 marks

ANSWER 10

- (a) Area of horizontal faces = 3.1 m^2 (2 marks)
Area of vertical faces = 3.72 m^2 (2 marks)
Total area of sheet metal required = 6.82 m^2 (1 mark)
- (b) Area of end = 1.15 m^2 (2 marks)
Volume = $1.15 \times 1.55 = 1.78 \text{ m}^3$ (1 mark)

Total 8 marks

ANSWER 11

- (a) Any THREE (1 mark each)
Flexible
Water tight
Within the same room
Above the floor (3 marks)
- (b) 80 mm (1 mark)
- (c) 1:60 (1 mark)

Total 5 marks

ANSWER 12

- (a) (i) Pressure reducing valve
(ii) Isolating valve
(iii) Non-return valve
(iv) Temperature-pressure relief valve
(v) Pressure limiting valve
(vi) Cold water expansion control relief valve (6 marks)
- (b) Any THREE (1 mark each)
Float valve/ballcock
Solenoid
Push stop tap/ spring loaded
Flushing meter (3 marks)

Total 9 marks

ANSWER 13

- (a) 0.17 m (1 mark)
- (b) 1.24% or 1:80 (1 mark)
- (c) 0.83% (1 mark)
- (d) 1:60 (1 mark)

Total 4 marks

ANSWER 14

- (a) The layering of water within a hot water cylinder due to different densities at different temperatures.
- (b) The amount of hot water drawn from the system during the time of biggest demand
- (c) A heat source that cannot be turned off when the hot water has reached the desired temperature. Such as a wetback or solar system, not thermostatically controlled.
- (d) A hot water system that can provide hot water for use in a shorter time than ordinarily available – usually with a second element higher in cylinder to provide hot water to the outlet quicker than a single low element would be able to achieve.
- (e) A hot water system that is heated via a heat exchanger
- (f) An exhaust pipe directly from the cylinder to atmosphere to vent any excessive pressure from the cylinder.

Total 6 marks

SECTION B

1. D A noisy flame with a pointed, blue inner cone.
2. B The density of the water.
3. C 1000.
4. A 15 minutes at 1500 kPa.
5. E The pump moves a measured portion of liquid by a plunger or gear.
6. A Centrifugal pump.
7. D 10.3 m.
8. E Measuring the vertical distance between the highest water level and the system outlet.
9. A It has a second element located higher in the cylinder.
10. B When the drain terminates outside the building.

Total 10 marks