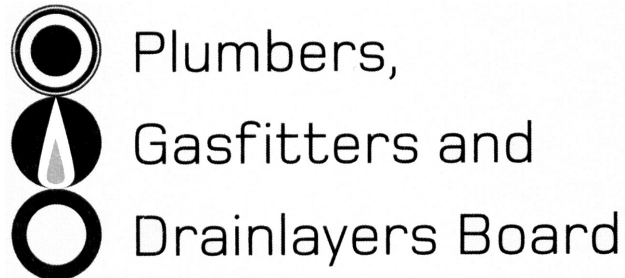


No. 9192



REGISTRATION EXAMINATION, NOVEMBER 2013
LICENSED PLUMBER

ANSWER SCHEDULE

ANSWER 1

- (a) Drawing to show (1 mark each)
- Cross sectional view
 - Inlet
 - Seat and washer
 - Piston
 - Outlet
 - Arm / Float
- (6 marks)
- (b) As the water level rises, the buoyancy of the float forces the float and arm up, which in turn pushes the washer against the seat, thereby stopping the water flowing into the tank.
- (2 marks)
- (c)
- Turn off the water supply.
 - Remove end cap from valve.
 - Remove split pin.
 - Remove float arm.
 - Push piston out through end of ball cock.
 - Unscrew washer retention cover, and remove and replace washer.

(½ mark each), (3 marks)

Total 11 marks

ANSWER 2

- (a) $r = 0.675$
- $3.142 \times 0.675^2 \times 0.880$ (1 mark)
- $3.142 \times 0.456 \times 0.880$
- 1.25978 m^3 (1 mark)
- $1.259 \times 1000 = 1259.78 \text{ litres}$ (1 mark)
- (3 marks)
- (b) Correct circumference calculated (2 marks)
- Correct scale (1 mark)
- Base of tank included (1 mark)
- Side of tank (1 mark)

(5 marks)

Total 8 marks

ANSWER 3

- (a) The water to the fixtures goes through copper pipe which is dissolving/corroding into the water and staining the fixtures. (1 mark)
- (b) Any THREE (1 mark each)
- There is a calcium build up on the shower rose blocking the outlet ports.
 - Debris has come through the water line blocking the shower mixer or rose.
 - The pressure reducing valve is faulty.
 - The incoming water pressure or flow from the network supplier or pump has been adjusted/changed.
 - There is a large leak in the water pipework.
 - The pipework has been crushed. (3 marks)
- (c) Any ONE (1 mark)
- Partial obstruction in pipework.
 - Sagging of pipework. (1 mark)
- (d) Any TWO (1 mark each)
- Another fixture within the building is being used at the same time / Inadequate pipe size.
 - Not enough water flow through a continuous flow water heater to keep the burner/element turned on.
 - Unequal hot and cold water pressure.
 - Pump cycling off and on.
 - Other fixture / appliance being used at the same time. (2 marks)
- (e)
- Clipping.
 - Installing a hammer arrestor.
 - Reduce the inlet pressure. (3 marks)

Total 10 marks

ANSWER 4

- (a) Copper and zinc. (2 marks)
- (b) De-zincification resistant. (1 mark)
- (c)
- Wrapping in petroleum-based tape.
 - Cathodic protection. (2 marks)

Total 5 marks

ANSWER 5

(a) Any FOUR (1 mark each)

- Ladder
- Fixed Scaffolding
- Cherry picker
- Scissor lift
- Mobile scaffolding

(4 marks)

(b) Any THREE (1 mark each)

- Harness
- Air bag
- Edge protection
- Safety net

(3 marks)

Total 7 marks

ANSWER 6

(a) (i) Parallel.

(1 mark)

(ii) Series.

(1 mark)

(b) Thermo-siphon
Forced – Pump

(2 marks)

Total 4 marks

ANSWER 7

(a) Lineal metre distance from proposed pump site to outlets.
Height difference between water supply level and pump (suction head).
Height difference between pump and outlets (delivery head).

(3 marks)

(b) Outlet
Impellers/vanes
Inlet/suction eye

(3 marks)

(c) EITHER

- Can deliver better flow rates.
- Non-pulsating flow.

(1 mark)

(d) EITHER

- Can deliver higher pressures.
- Self-priming.

(1 mark)

Total 8 marks

ANSWER 8

(a)

Label	Name
A	Isolating valve
B	Filter
C	Solenoid valve
D	Control Box – PCB
E	Sensor
F	Flush pipe / sparge pipe
G	Sparge pipe/ spreader

(7 marks)

- (b) The **sensor picks up movement** or heat in the room indicating the presence of a person at the urinal and **sends this information** to the control box.

The control box allows an electrical **signal** to be sent to the solenoid valve, **charging the coil** and **opening the valve**.

Water is then permitted to flow through the valve and **into the urinal flush pipe and spreader**.

(½ mark each) (3 marks)

Total 10 marks

ANSWER 9

	Name of device in full	Tick if isolation valve is required upstream	Tick if isolation valve is required downstream
A	Double check valve	Yes	Yes
B	Atmospheric vacuum breaker	Yes	No
C	Reduced pressure zone/detector	Yes	Yes
D	Pressure vacuum breaker	Yes	Yes

Name – (1 mark each)

Both valve locations correct (1 mark per row)

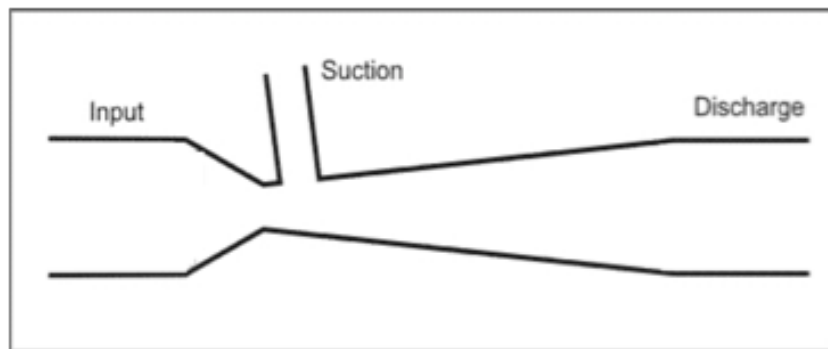
Total 8 marks

ANSWER 10

(a) Pressure, volume and temperature.

(3 marks)

(b) (i)



(1 mark)

(ii) The velocity of the main water increases as the pipe narrows, as it enters the wider part of the tube it creates a suction effect pulling water in from the branch supply.

(2 marks)

(iii) Any ONE

- Shower mixer
- Deep-well jet pump
- Embalming equipment

(1 mark)

Additional suitable answers are accepted.

Total 7 marks

ANSWER 11

(a) To prevent foul air and gases entering buildings.

(1 mark)

(b) Any TWO (1 mark each)

- When a permitted fixture discharges to a floor waste gully and the waste pipe length is within set limits.
- When the fixture is a floor waste receiving accidental overflow only and not discharging to a foul water system.
- Double bowl installations.
- Washing machine side pipes.

(2 marks)

Total 3 marks

ANSWER 12

- (a) (i) The unit of measure for the discharge (hydraulic load) in the plumbing system.
- (ii) It is based on the rate, duration and frequency of discharge from a sanitary fixture or sanitary appliance.

(2 marks)

(b)

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

(3 marks)

Total 5 marks

SECTION B

- 1 B To prevent a thermosiphon current from forming.
- 2 D 600 mm
- 3 A Where two branches enter a discharge stack at the same level.
- 4 E At the junction of a relief vent with a discharge stack.
- 5 B Bidet.
- 6 C Centrifugal pump.
- 7 A A heat exchanger.
- 8 E Boiling.
- 9 C 40 mm
- 10 D 3.5 m
- 11 D 1 in 40
- 12 B 1.2 m
- 13 E 150 mm
- 14 D 1:60

Total 14 marks