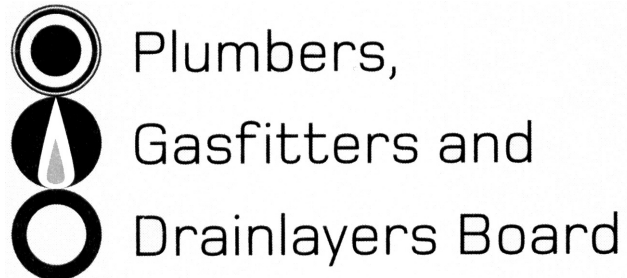


No. 9192



REGISTRATION EXAMINATION, NOVEMBER 2012
LICENSED PLUMBER

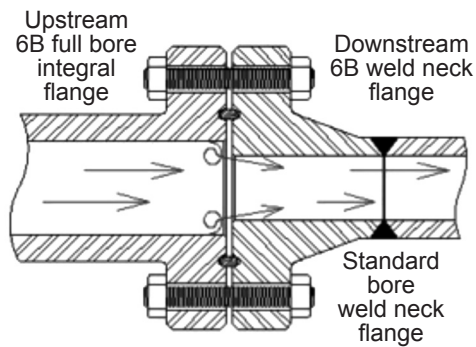
ANSWER SCHEDULE

ANSWER 1

- (a) Point at connection to wall socket should be indicated – circle, arrow or other. (1 mark)
- (b) Any 3 – 1 mark each
Overheating if used whilst coiled up.
Crushed by heavy objects/trolleys being run over lead.
Being caught on sharp edges.
Stretching to reach areas beyond comfortable length of lead. (3 marks)
- Total 4 marks**

ANSWER 2

- (a) Spirit level.
Laser level.
Smart level.
Builders/dumpy level.
Water filled hose. $\frac{1}{2}$ mark each, (2 marks)
- (b) Drawing to be cross-sectional.
Drawing to show – as per example below.
Flange.
Seal.
Nuts and bolts.



- (c) (i) Tin.
Lead. 1 mark each, (2 marks)
- (ii) Either One – 1 mark
Spirits of Salts.
eHydrochloric acid. (1 mark)

- (c) (iii) The purpose of flux is to chemically clean the surface – remove the galvanised coating and any grease or oxidation on the parent metal.
To lower the surface tension of the solder allowing it to run into the space to be sealed. (1 mark)
- (iv) The metal must be rinsed to remove any traces of flux as it is highly corrosive. (1 mark)
- (v) The heat from the bolt boils the flux ahead of the solder cleaning the metal before the solder makes contact. The heat also encourages capillary attraction of the solder into the space between the two surfaces. (2 mark)
- Total 10 marks**

ANSWER 3

- (a) A Non return valve
B Cold water inlet
C Wax element
D Mixed outlet
E Adjusting screw (5 mark)
- (b) Tempering valves blend hot and cold water to deliver mixed water at a constant temperature. They incorporate a temperature sensitive element which expands and contracts depending on the temperature of the water flowing across it. This action of the element in turn moves a piston which shuttles between the hot and cold ports. In doing so the valve maintains an essentially constant outlet temperature. (4 marks)
- (c) When the hot water is used to supply personal hygiene sanitary fixtures. (1 mark)
- Total 10 marks**

ANSWER 4

- (a) Length – mm, cm, m, km
Volume – as above ³
Capacity – litres
Area – as Length ²
Velocity – m/sec
Pressure – Pa, kPa

(3 marks)

- (b) Straight horizontal line to be shown at 27.5 metre mark.
Proving conversion of kPa to metres.
Knowledge of difference between static and hydraulic.
Level independent of container size.

(3 marks)

- (c) (i) Hard water is caused by water dissolving minerals such as calcium which are then held in solution in the water.
excess of calcium salts in water.
(ii) This can happen when water travels a long distance over/through soil or rock.
e.g. sourced from a bore.

(2 marks)

Total 8 marks

ANSWER 5

	Number of tees required for hot pipework	Number of tees required for cold pipework
(a)	5	9

(2 marks)

- (b) (i) 1500 kPa

(1 mark)

- (ii) 15 minutes

(1 mark)

- (c) Isolating
Filter
Non return
Pressure limiting
Cold water expansion
Valves in correct order

(3 marks)

Total 6 marks

ANSWER 6

- (a) The heat from a single heat source within in the dwelling is circulated throughout the required areas of the dwelling. (1 mark)
- (b) Any TWO (1 mark each)
A boiler and radiator system – hot water.
A gas furnace and ducting system – hot air.
An electric element and ducting system – hot air.
Heat pump. (2 marks)
- (c) Any FIVE (1 mark each)
A hearth/non-combustible base for the fire to sit on.
A double skinned flue with 25 mm gap between flue and any combustible materials within roof space.
12.5 mm air gap between flue and ceiling plate to prevent heat transfer or specially designed ceiling plate to provide cooling air.
12 mm heat resistant spacers installed between ceiling plate and ceiling.
Minimum distances provided between firebox and combustible wall linings.
Non-combustible wall linings installed when minimum distances are not achieved.
Shield/deflector installed behind flue if minimum distances from wall not achieved.
Seismic restraints

(5 marks)

Total 8 marks

ANSWER 7

- (a) 10.3 metres (1 mark)
- (b) Because the pump is situated above the water it is required to create a vacuum within the pipe allowing atmospheric pressure to push the water into the pipe.
The weight of the atmosphere on the surface water of the well limits the height to which the water can be pushed.

(2 marks)

Total 3 marks

ANSWER 8

- (a) $A = L \times W$
 $A = 1200 \times (900 + 1000 + 400 + 200 + 500 + 800)$
 $A = 1200 \times 3800$
 $A = 4\,560\,000 \text{ mm}^2$ or 4.56 m^2 (3 marks)
- (b) $V = L \times W \times H$
 $V = (900 \times 1000 \times 1200) - (500 \times 200 \times 1200)$
 $V = (1\,080\,000\,000) - (120\,000\,000)$
 $V = 960\,000\,000 \text{ mm}^3$ or 0.96 m^3 (3 marks)
- (c) Drawing of correct section of ducting.
Drawing is an elevation.
Drawing to correct scale. (3 marks)
- Total 9 marks**

ANSWER 9

- (a) To provide access for cleaning and clearing blockages. (1 mark)
- (b) At the junction of a soil discharge pipe with a discharge stack.
Where a number of changes of direction occur.
In a discharge pipe where access to junction or changes of direction are restricted.
At the base of any soil stack at the point of connection to the drain.
G13 – 4.2.2
1 mark each, (4 marks)
- (c) Any FOUR – 1 mark each
Must be external.
Must be 50 mm above the overflow level of the fixture they serve.
Must be 3 m above ground level.
Must be 600 mm above window or other opening.
Must be 3 m below or horizontally from window or other opening.
Must be 150 mm above roof.
Must be 3 m away from deck.
Must be 600 mm away from eaves and parapets.
Must be 5 m away from any air intakes.
As per G13 – 5.7 (4 marks)
- Total 9 marks**

ANSWER 10

- (a) Any 3 – 1 mark each
Vegetation – leaves etc.
Animal faeces.
Dead birds/animals.
Toxic paint/roofing materials.
Airborne pollutants – sprays – smoke from open fires. (3 marks)
- (b) Any 2 – 1 mark each
Filter harvested rain water before it enters the tank – Gutter guard/Leaf screen.
First flush diverter.
Use suitable roof and downpipe material.
Keep trees in the area well pruned to prevent them overhanging the roof.
Do not install an aerial on the roof.
Clear gutters regularly.
Locate chimneys away from rain water collection areas. (2 marks)
- (c) Water delivery by truck.
Alternative mains water supply.
Bore water/spring.
Increase the storage capacity of the tank. (1 mark)
- (d) Hose tap – garden irrigation, car washing.
WC cistern supply.
Laundry tub/washing machine supply. (3 marks)

Total 9 marks