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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

NOVEMBER EXAMINATION

PLUMBING THEORY N1

17 NOVEMBER 2016

This marking guideline consists of 7 pages.

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QUESTION 1

1.1 Minimum of 75 mm√ and maximum of 200 mm√ (2)

1.2 Good housekeeping means that there is a certain place for everything in its specified place√√ (2)

1.3 An accident is an unplanned event which does not conform to the normal expected mode of operation.√ (1)
[5]

QUESTION 2

2.1
- Source of electricity√ should be connected to an earth-leakage device.√
- Flexible electric chord and wiring√ must be safe and in order.√
- Plugs√ must be connected correctly and in good condition.√
- Tools√ must be fitted with a switch to allow for easy and safe starting and stopping operation of the tools.√ (Any 3 × 2) (6)

2.2
- Chain wrench√
- Basin spanner√
- Ring and open-ended spanners√
- Adjustable spanner√
- Pipe wrench√ (Any 4 × 1) (4)

[10]

QUESTION 3

3.1 Dezinctification = The removal of zinc content by aggressive electrolyte in soil and water

3.2 Plumbosolvency = Lead poisoning due to solvent effects of acid water on lead pipes

3.3 Corrosion = A chemical reaction or electrochemical action which causes decay or eating away of metal

3.4 Electrolytic reaction = Ions flow from cathode to anode through electrolyte and this action causes destruction of anode

(4 × 2) **[8]**

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QUESTION 4

4.1
- Never test for leaks with a flame.
- Never direct the flame towards fellow workers.
- Ensure that dry powder or carbon dioxide fire extinguishers are readily available and that sand buckets are kept clean and free of combustible material.
- Welding work areas should be well-ventilated to remove fumes.
- Never use acetylene or handigas cylinders placed in a horizontal position.

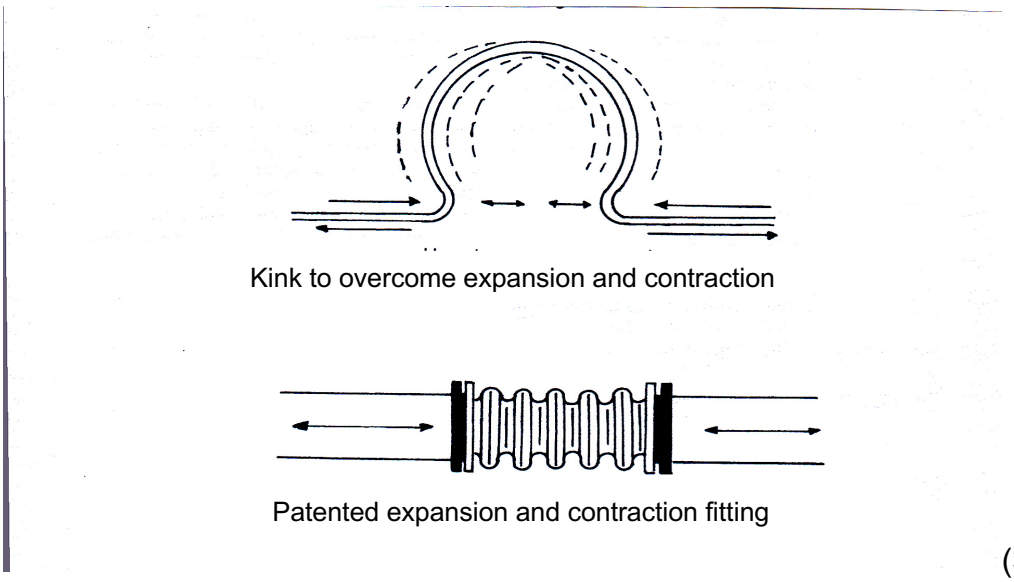
(Any 2 × 1) (2)

4.2
- It assists in the cleaning of the material to be soldered.
- It prevents oxidation during the soldering process.
- It promotes the flow of solder when soldering. (3)

4.3 Test by bending the stick of solder.√ If a crackling sound is heard, the solder contains more tin than lead√ but if it bends easily without any sound, it contains more lead than tin. √ A stick of solder with more tin gives a shiny bright colour√ while one with more lead gives a dull colour.√ (Any 3 × 1) (3)
[8]

QUESTION 5

5.1



Kink to overcome expansion and contraction

Patented expansion and contraction fitting

(3 × 2) (6)

5.2
- Flux√
- Steel wool√
- Soldering wire √
- Copper pipe cutter√
- Gas burner/blow torch√
- Equal T-piece√ (6)

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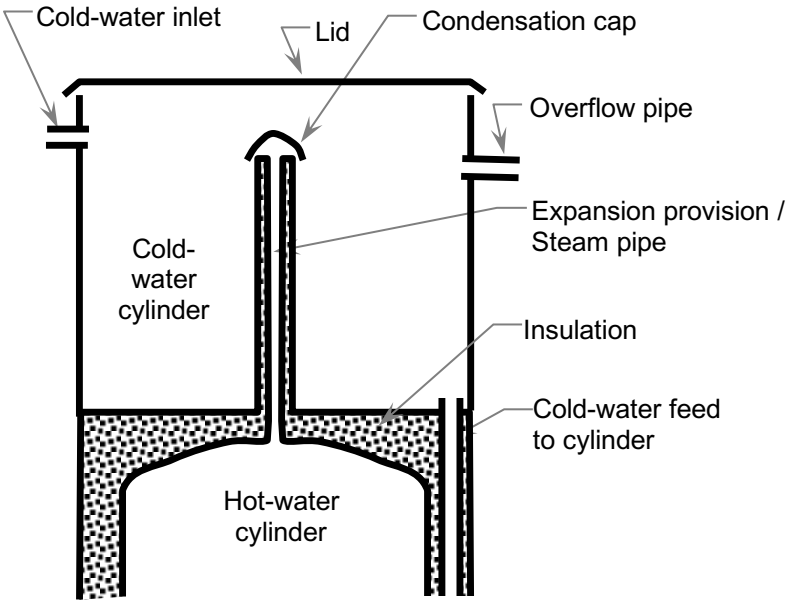
5.3 A stopcock is mostly fitted on a high-pressure system√ and when the crutch is turned anticlockwise, it lifts the spindle√ and due to pressure the water forces the washer plate upwards and allows the flow√ of water through the seat to the spout.√ (4)

5.4 Drinking water is water that is safe to drink or to use for food preparation, without the risk of health problems.√√ (2)
[18]

QUESTION 6

6.1



(8)

6.2 6.2.1 Yellow

6.2.2 Blue

6.2.3 Black

6.2.4 Red

(4 × 1) (4)
[12]

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QUESTION 7: DRAINAGE

7.1 7.1.1 The sewer pipe will get blocked. Solids/excrement will not flow.√

7.1.2 It will also block the sewer line. The liquids will flow ahead of the solids. Therefore the sewer line will block up.√

(2 × 1) (2)

7.2
- Cut both pipes to be joined, squarely.
- File the one end of the pipe to a chamfer/sharp edge to accommodate the rubber ringed end and sandpaper the squared cut that has to be glued.
- Clean both ends of the pipes with a clean cloth.
- Prepare the joining socket by cleaning both the rubber seal and the glued (pentaweld) sides with a specified cleaning solvent.
- Apply a lubricant (for joining the uPVC pipe) to the outer side of the chamfered pipe end as weel as the inner side of the rubber ring of the socket.
- Press the two lubricated sides evenly into each other with a slight twist until the chamfered/spigot ends clear the rubber seal entirely.
- Apply glue (pentaweld) to the outer side of the pipe and the inner side of the socket (apply evenly and sparingly) and press the two sides in evenly, also with a slight twist to the full allowance made on the socket.
- Clean excess glue off the pipe and allow to set for at least 12 hours before disturbing/using the pipes. (8)

7.3 Yes, √ because of the flexibility of the joints on the uPVC pipes√ (2)

7.4 7.4.1 Washbasin, bath, sink, shower, wash trough

7.4.2 Water closet, urinal√

(2 × 1) (2)

7.5 Clay√ (1)

7.6 7.6.1 Access opening√

7.6.2 Bidet√

7.6.3 Cleaning eye√

7.6.4 Gully√

(4 × 1) (4)

[19]

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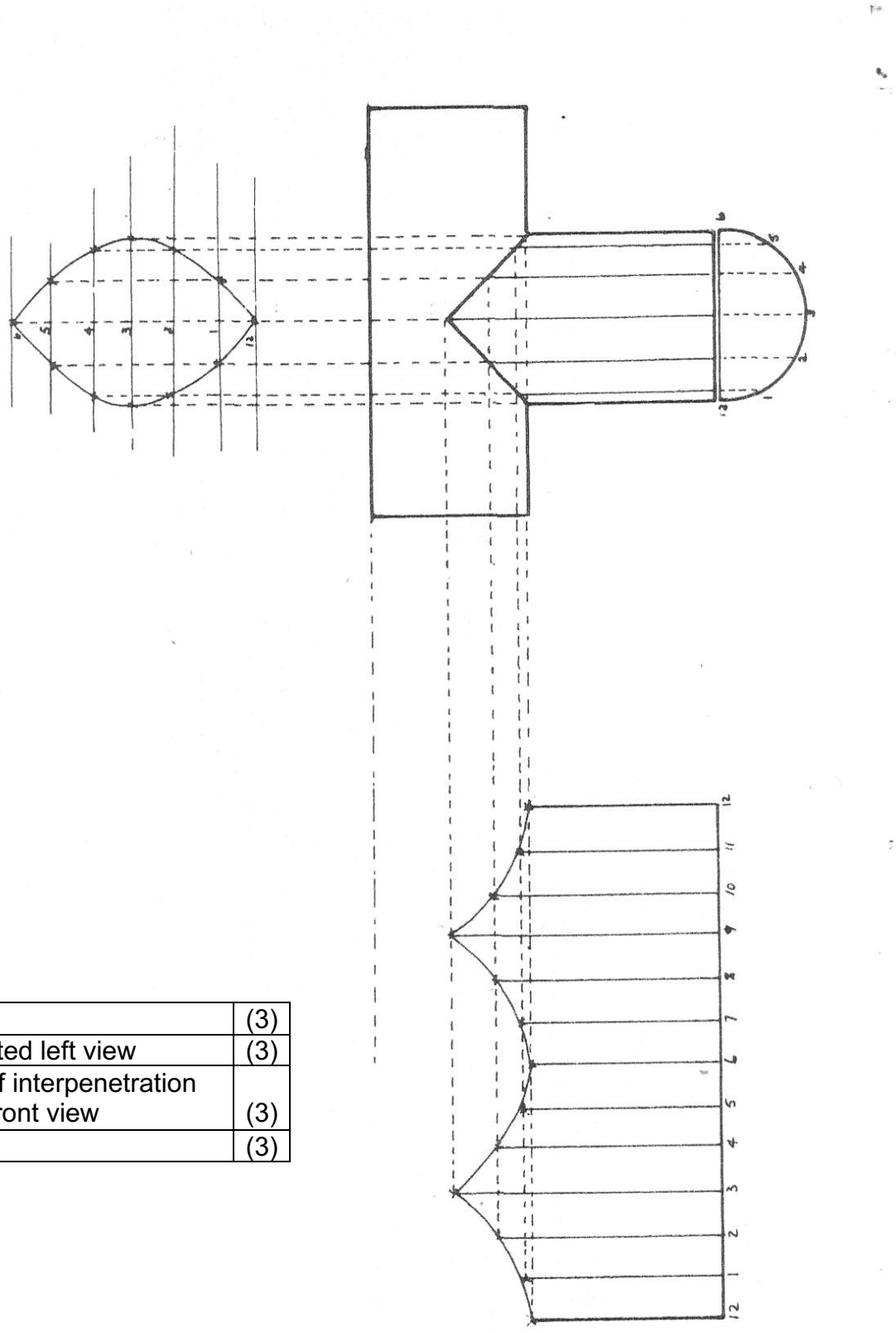
QUESTION 8: SHEET-METAL WORK



T-piece	(3)
Completed left view	(3)
Curve of interpenetration on the front view	(3)
Pattern	(3)

[12]

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QUESTION 9: CALCULATIONS

9.1 Area of circle = πr^2√

= $\pi \times 3^2$√

= $\pi \times 9$√

= 28,274/2√

= 14,137 m^2√ (5)

9.2 Volume = $l \times b \times h$√

= $6 \times 4 \times 3$√

= 72 m^3√ (3)
[8]

TOTAL: 100

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