



**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.**

**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]**

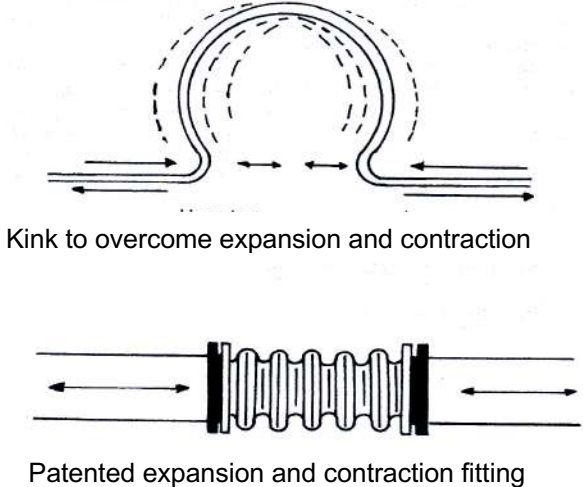
**QUESTION 3**

- 3.1 Dezincification = 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]**

**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]**

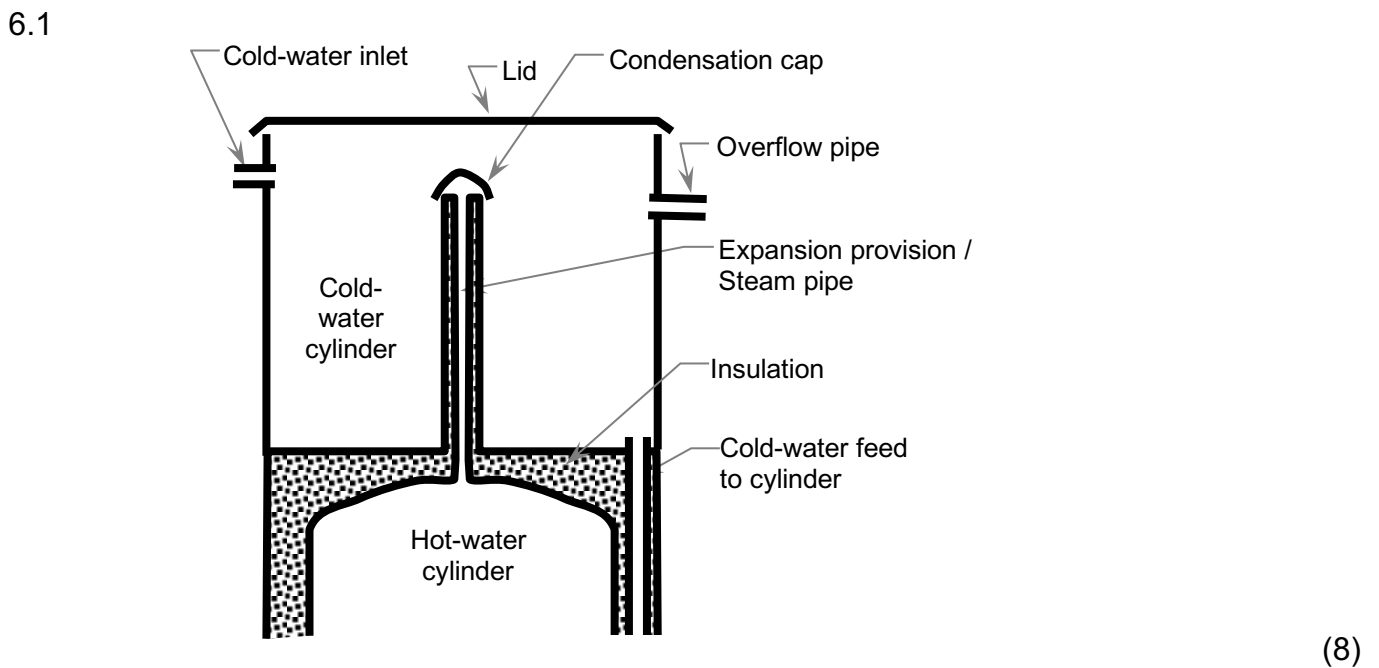
**QUESTION 5**

- 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)

- 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**

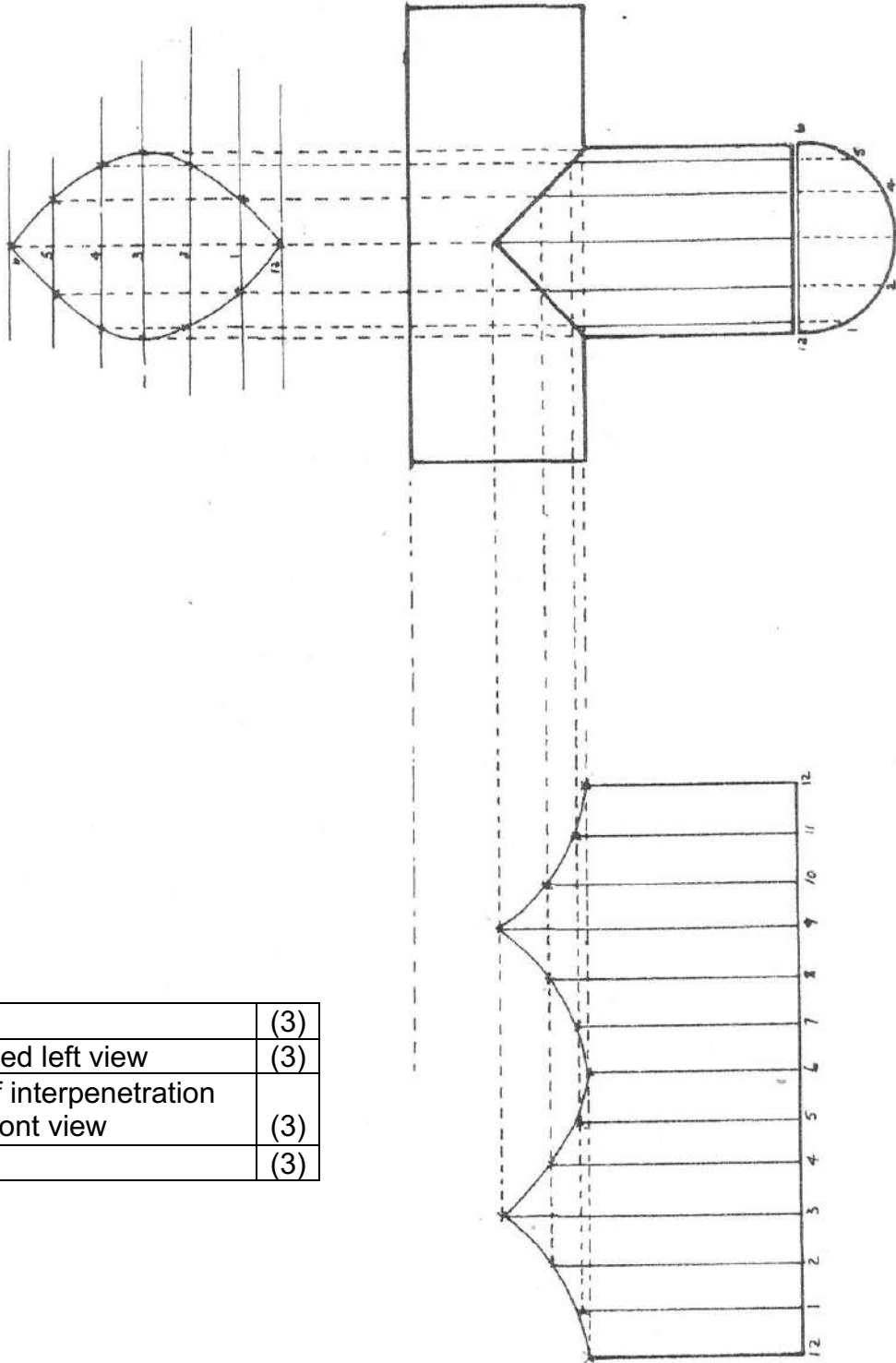


- 6.2 6.2.1 Yellow
- 6.2.2 Blue
- 6.2.3 Black
- 6.2.4 Red
- (4 × 1) (4)  
[12]

**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 well 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]**

**QUESTION 8: SHEET-METAL WORK**



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

[12]

**QUESTION 9: CALCULATIONS**

9.1 Area of circle =  $\pi r^2$

$$= \pi \times 3^2$$
$$= \pi \times 9$$
$$= 28,274/2$$
$$= 14,137 \text{ m}^2 \quad (5)$$

9.2 Volume =  $l \times b \times h$

$$= 6 \times 4 \times 3$$
$$= 72 \text{ m}^3 \quad (3)$$

**[8]**

**TOTAL: 100**