



# higher education & training

Department:  
Higher Education and Training  
**REPUBLIC OF SOUTH AFRICA**

## **MARKING GUIDELINE**

**NATIONAL CERTIFICATE**

**APRIL EXAMINATION**

**PLUMBING THEORY N1**

**16 APRIL 2015**

**This marking guideline consists of 7 pages.**

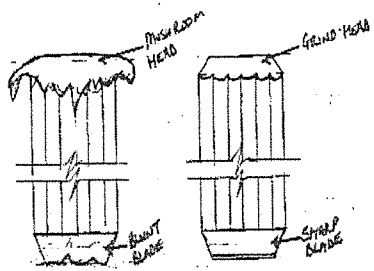
**QUESTION 1**

- 1.1 The main objective is to make employer and employee jointly responsible for safety at place of work and for the protection of public. (2)
- 1.2
  - Periodic inspection of the scaffolding, plant and stores to ensure no obvious hazards.
  - Recording of any accidents and sending them to Department of Labour for investigations. (2)
- 1.3
  - Tripping over loose objects on floors, stairs and platforms
  - Slipping on grease, wet or dirty surfaces
  - Striking against projecting, poorly stacked items
  - Being hit by falling objects
  - Cutting, puncturing or tearing of hands or other parts of the body on projecting nails, wire and steel strappings
  - Improper use of tools for specific job
  - Un-guarded excavations (Any 4 x 1) (4)

[8]

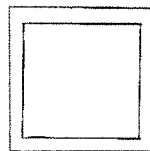
**QUESTION 2**

2.1



(5)

2.2



(3)

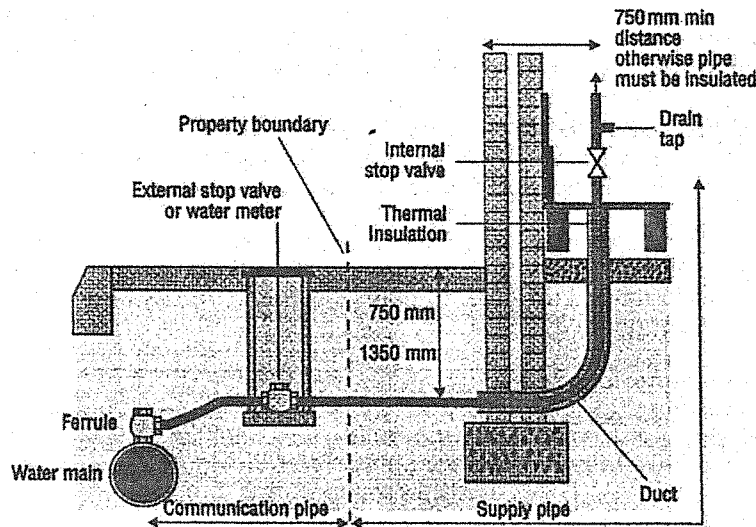
- 2.3
  - Hardening – is an increase in hardening of metal which is caused by bossing and hammering.
  - Tempering – is the level of hardness which can change from dead hard to dead soft .e.g. copper becomes dead hard when hammered and dead soft when annealed.

(4)  
[12]



**QUESTION 5**

5.1



(10)

5.2

- 1 – Crutch
- 2 – Spindle
- 3 – Gland nut
- 4 – Head gear
- 5 – Body
- 6 – Seat
- 7 – direction of flow

(7)  
[17]

**QUESTION 6**

6.1

Causes

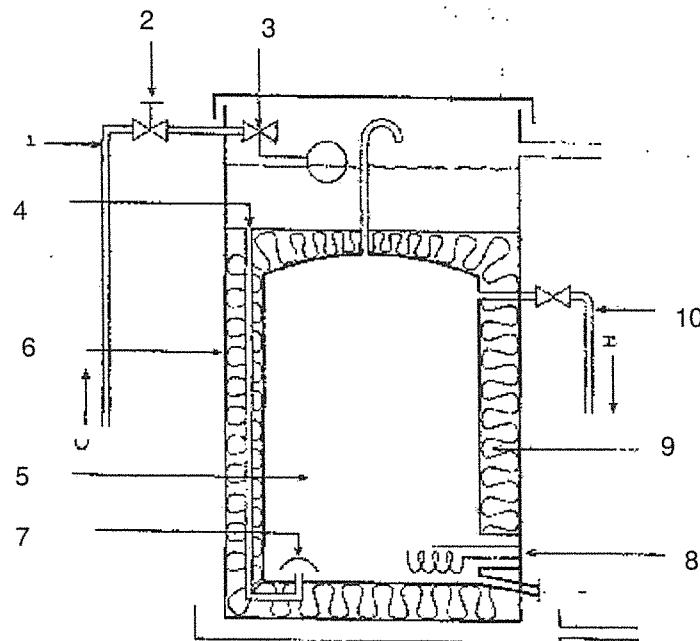
- Lime deposits in the pipe and restricting the flow of water
- Closing taps quickly
- Mass flow of water stopped abruptly
- Tap situated at the long run of piping

Remedy

- Close taps slowly
- Rubber washers should not be used on the plunger
- Air vessel should be installed

(5)

6.2



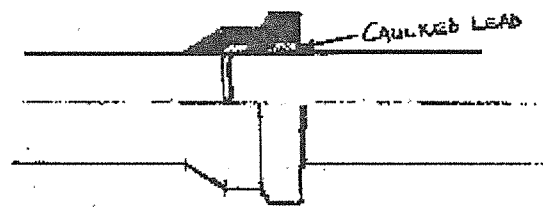
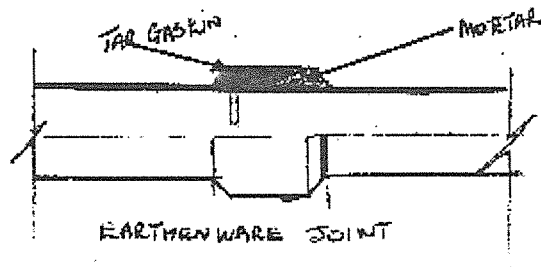
(5)

- 1 – Cold water supply from mains
- 2 – Stop cock
- 3 – Float control valve
- 4 – Cold water supply to heating cylinder
- 5 – Heating cylinder
- 6 – Metal casing
- 7 – Cold water inlet to cylinder with baffle as silencer
- 8 – Element and thermostat to regulate and heat water
- 9 – Insulation
- 10 – Hot water supply pipe to draw off points

(10)  
[20]

QUESTION 7

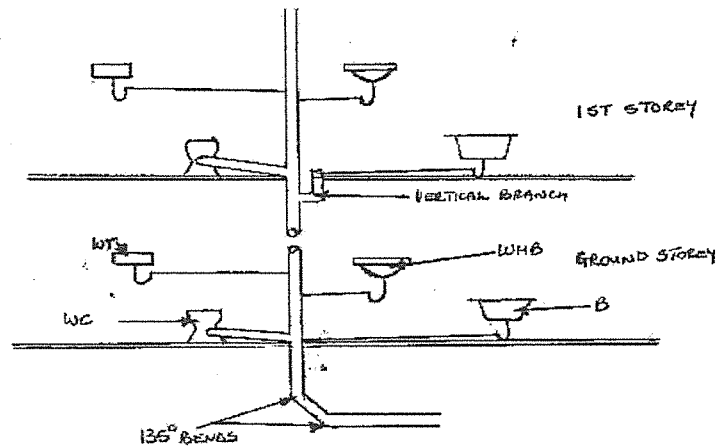
7.1



CAST IRON JOINT

(4)

7.2



(6)  
[10]

**QUESTION 8**

$$\begin{aligned} 8.1 \quad \text{Volume} &= \text{height} \times 3,142 \times r^2 \\ &= 3 \times 3,142 \times 0,3^2 \\ &= 0,848 \text{ m}^3 \end{aligned}$$

$$1 \text{ m}^3 \text{ of water} = 1\,000\,000 \text{ cm}^3$$

$$\text{and } 1\,000 \text{ litres of water} = 1\,000 \text{ kg}$$

$$1 \text{ litre} = 1\,000 \text{ cm}^3$$

$$\text{therefore } 0,848 \text{ m}^3 \times 1\,000\,000$$

$$= \frac{848\,000 \text{ cm}^3}{1\,000}$$

$$= 848 \text{ litres}$$

(7)

$$\begin{aligned} 8.2 \quad \text{Head of water} &= \frac{\text{intensity of pressure}}{9,8 \text{ kN/m}^2} \\ &= \frac{300 \text{ kN/m}^2}{9,8 \text{ kN/m}^2} \\ &= 30,6 \text{ m} \end{aligned}$$

(7)

[14]

**TOTAL: 100**