higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLUMBING THEORY N1

7 April 2020

This marking guideline consists of 6 pages.

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QUESTION 1: SAFETY AND HOUSEKEEPING

1.1 The main aim is to make the employer✓ and employee jointly responsible for safety at the workplace✓ and for the protection of the public.✓ (3)

1.2 Good housekeeping means that there is a place for everything✓ and everything at its specific place.✓ (2)
[5]

QUESTION 2: TOOLS AND MACHINES

2.1
2.1.1 Tin snips
2.1.2 Scriber
2.1.3 Groover
2.1.4 Divider
2.1.5 Centre punch
2.1.6 Sliding square
(6 × 1) (6)

2.2
- Test the wheel for cracks.
- Do not overtighten the wheel.
- Do not ream the hole of the wheel.
- Use the correct grinding wheel for the type of metal to be ground.
- Use a paper packing between the wheel and the flange.
- The tool rest should be approximately 3 mm from the wheel and square with it.
- Replace the wheel when necessary. (Any 4 × 1) (4)

[10]

QUESTION 3: METALS AND MATERIALS

3.1
3.1.1 It is soft, tough, tensile and malleable. (Any relevant answer)

3.1.2 Copper is corrosion-free and is a good conductor of heat and electricity. (Any relevant answer)

3.1.3 Copper is used for wire, rivets, nails, plates, flat, square and round rods, electric contact points and for the manufacturing of a variety of alloys. (Any relevant answer)
(3 × 1) (3)

3.2
- To lower the melting point of one or more of the constituent metals
- To change the colour
- To form a harder and tougher substance
- To conform the resistance to atmospheric conditions
- To improve decrial resistance
- To improve castability (Any 5 × 1) (5)

[8]

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QUESTION 4: SOLDERING AND WELDING

4.1 4.1.1 It is a process of fusing metals together✓ using electrodes and electrical current.✓ These electrodes are used to create the electric arc melts✓ and serve as a filler rod leaving a molten puddle.✓

4.1.2 When soldering is done the material must be clean and free from rust.✓ Apply the flux to the joint to be welded with a self-made brush.✓ Hold the soldering iron in one hand and a soldering stick in the other.✓ Bring the solder and the tip of iron to the joint making sure that the solder penetrates in the joint.✓

(2 × 4) **[8]**

QUESTION 5: COLD-WATER SUPPLY

5.1 5.1.1 Cap
5.1.2 Coupling
5.1.3 Bushing
5.1.4 90° elbow
5.1.5 45° bend
5.1.6 Equal T-piece
5.1.7 Reducer elbow
5.1.8 Transition elbow
5.1.9 Male transition coupling
5.1.10 Female transition coupling

(10 × 1) (10)

5.2
- PVC pipe
- HDPE pipe
- Polycop pipe
- LLDPE pipe
- uPVC pipe
- PEX pipe

(Any 4 × 1) (4)

5.3
- Smell
- Colour
- Taste
- Boiling point
- Freezing point
- Expansion and contraction
- Density

(Any 4 × 1) (4)
[18]

QUESTION 6: HOT-WATER SUPPLY

6.1 6.1.1 50 kPa
6.1.2 400 kPa
6.1.3 100 kPa
6.1.4 75 kPa
6.1.5 200 kPa

(5 × 1) (5)

6.2 6.2.1 Radiant energy is energy or heat radiated by the sun✓ in the form of waves.✓

6.2.2 Solar energy is energy given off by the sun✓ in the form of heat and light.✓

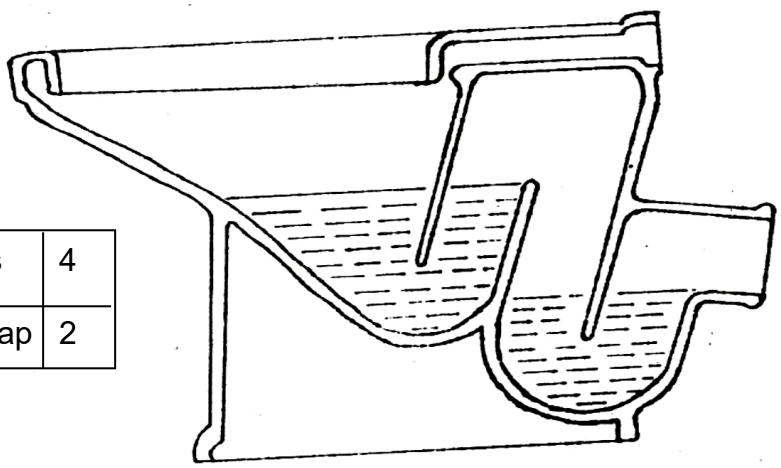
(2 × 2) (4)

6.3
- It takes up very little space.
- It reduces labour and material costs.
- The valve is easily accessible for repairs.
- Pressure at the draw-off points is increased. (Any 3 × 1) (3)

[12]

QUESTION 7: DRAINAGE

7.1



Neatness	4
Double trap	2

(6)

7.2
- Toilet✓: WC✓
- Urinal✓: U✓
- Bath✓: B✓
- Kitchen sink✓: S✓
- Shower✓: SW✓
- Washbasin✓: WB✓
- Bidet✓: BT✓

(1 mark for each sanitary fixture, 1 mark for its abbreviation) (Any 4 × 2) (8)

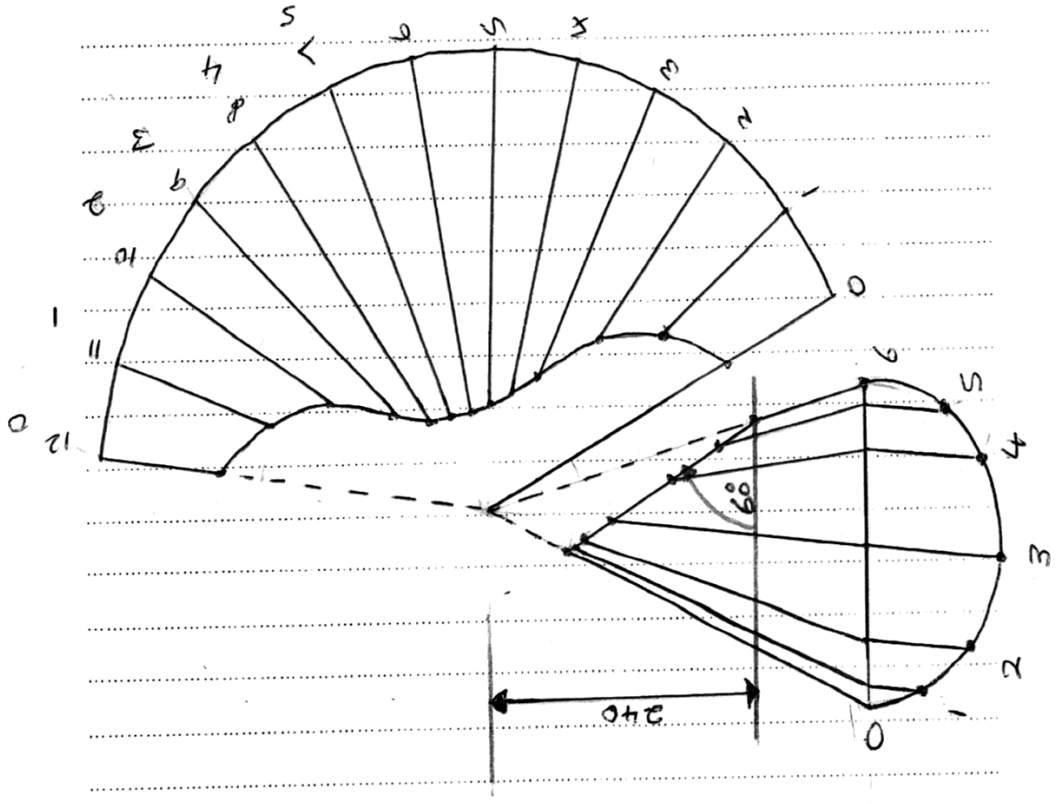
7.3
- A one-pipe system is where all the soil water fixtures and waste-water fixtures discharge into a single stack✓ and connect directly to the drain.✓
- A two-pipe system is where all waste fixtures discharge separately into an open waste stack that discharges into a gully✓ and all soil fixtures discharge directly into the drain.✓ (4)

7.4 The water closet (toilet) pan has a built-in water-seal trap✓ and will therefore not need to be fitted with a water-seal trap.✓ (2)
[20]

QUESTION 8: SHEET METALWORK

MARK ALLOCATION

Elevation	=	2
Scale	=	1
Neatness	=	2
Pattern	=	7
TOTAL	=	12



[12]

QUESTION 9: CALCULATIONS

9.1 Volume of the tank = area of base x height

= 3,142 × r × r × h✓

= 3,142 × 1 × 1 × 2,6✓

= 8,2 cubic metres✓ (3)

9.2 Contents of the tank = 8,2 cm^3 × 1 000 kg/cm^3✓

= 8 200 litres✓ (2)

9.3 Mass of water = content in litres × mass of 1 litre of water

= 8 200 × 1 kg✓

= 8 200 kg✓ (2)
[7]

TOTAL: 100

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