higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLUMBING THEORY N1

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This marking guideline consists of 5 pages.

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QUESTION 1: SAFETY AND HOUSEKEEPING

1.1 1.1.1 When climbing up or down a ladder, the user must face the ladder✓ and at least one hand must be free to have a firm grip on the ladder while ascending or descending.✓

1.1.2 Ladders should be inspected at regular intervals✓ and identified defects must immediately be repaired.✓

(2 × 2) (4)

1.2 An accident is an unplanned event that do not conform to the normal expected mode of operation. (1)

[5]

QUESTION 2: TOOLS AND MACHINERY

2.1 Pipe cutter✓ used to cut exactly 90° to the length of the pipe.✓

2.2 Hacksaw✓ used especially for cutting uPVC pipes and metals.✓

2.3 Scriber✓ used to mark accurate lines on sheet metal for cutting or developing purposes.✓

2.4 Divider✓ used to draw circles with or bisect distances accurately.✓

2.5 Centre punch✓ used to make small dents in metal where holes must be drilled, giving the drill a certain starting point.✓

(5 × 2) **[10]**

QUESTION 3: METALS AND MATERIALS

3.1 The coefficient of expansion is the change in length per unit length✓ when the metal is heated uniformly by 1 °C.✓ (2)

3.2
- Galvanising
- Bitumen composition
- Enamelled iron
- Paint

(Any 3 × 1) (3)

3.3 It is acid corrosion that takes place between different materials such as copper and galvanised materials.✓ The chemical corrosion is particularly noticeable when water has an acid content.✓ The acid in the water causes the liquid to conduct an electrical current.✓ (3)

[8]

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QUESTION 4: SOLDERING AND WELDING

4.1 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 with more tin gives a shiny bright colour whilst one with more lead gives a duller colour.✓ (4)

4.2 4.2.1 Blue
4.2.2 Maroon/Red
(2 × 1) (2)

4.3
- Gloves
- Spats
- Overalls
- Leather aprons
- Cutting goggles (Any 2 × 1) (2)

[8]

QUESTION 5: COLD-WATER SUPPLY

5.1
- Wells
- Rivers
- Springs
- Up-land surface water
- Rainwater (Any 4 × 1) (4)

5.2
- Cut the GMS pipe to size.
- Ream the inside bore of the pipe.
- File the outside edge.
- Make threads using a dicing machine or stocks and dies. (4)

5.3 Bib taps are designed to be fitted into the wall over appliances whilst pillar taps are designed to fit directly into the sanitary appliance and secured by a back nut. (4)

5.4 Capillary joint✓ – soldering✓
Compression joint✓– screw✓ (4)

5.5 Hemp is used to make joints watertight. (2)

[18]

QUESTION 6: HOT-WATER SUPPLY

6.1
- Radiation✓ is the transfer of heat from one body to another that is not in contact.✓
- Conduction✓ is the distribution of heat by contact of the layers of a substance with one another.✓
- Convection✓ is the distribution of heat by circulation of a liquid or gas.✓ (3 × 2) (6)

6.2 Thermal insulation on hot-water pipes is a way of saving heat energy.✓ Hot-water pipes that are used a lot are covered with a thermal insulation layer that keeps most of the water's heat inside the pipe.✓ When the pipe is used again, it is still warm✓ and does not absorb as much of the water's heat.✓ (4)

6.3 6.3.1 100 °C
6.3.2 0 °C
(2 × 1) (2)
[12]

QUESTION 7: DRAINAGE

7.1 7.1.1 Non-excremental liquid discharged from waste-water fittings.

7.1.2 Excremental liquid discharged from soil-water pipes.

7.1.3 A pipe that conveys used water from a sanitary fixture and discharges it to a drain.

7.1.4 Waste water, soil water or other liquid waste, excluding water from private drains
(4 × 2) (8)

7.2
- Earthenware (vitrified clay) pipe
- uPVC
- Cast iron
- Fibre cement (4)

7.3
- Stall urinal
- Bowl urinal (2)

7.4 A chamber not deeper than 750 mm✓ and of such dimensions that access may be obtained to the drain without requiring a person to enter such a chamber.✓ (2)

7.5 Yes,✓ because of the flexibility of the joints on the uPVC pipe, provided it has been partially compacted.✓ (2)

7.6 Yes,✓ because of its durability/hardness/toughness.✓ (2)
[20]

QUESTION 8: SHEET METALWORK

8.1 8.1.1 Rolled joint
8.1.2 Weld joint
8.1.3 Slip joint
8.1.4 Grooved seam joint
8.1.5 Pittsburgh lock joint

(5 × 1) (5)

8.2 To join two sheet metal parts together. (2)

8.3
- Parallel-line method
- Radial method
- Triangulation method

(Any 2 × 1) (2)

8.4
- Lead
- Copper
- GMS
- Aluminium

(Any 3 × 1) (3)
[12]

QUESTION 9: CALCULATIONS

9.1 Circumference of sheet = 2 × length + 2 × width✓

= 2(4 × 3)✓

= 2 × 12✓

= 24 m✓ (4)

9.2 Area of sheet = l × w✓

= 4 × 3✓

= 12 m^2✓ (3)
[7]

TOTAL: 100

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