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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLUMBING THEORY N1

23 November 2022

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QUESTION 1: SAFETY AND HOUSEKEEPING

1.1 1.1.1 Toe boards prevent tools, materials or equipment from sliding off the edge of the working platform.

1.1.2 Guardrails prevent operatives from stepping or falling off the working platform.

(2 × 2) (4)

1.2 38 mm (1)

[5]

QUESTION 2: TOOLS AND MACHINES

2.1
- 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.
- Place the tool rest approximately 3 mm from the wheel and square with it.
- Replace the wheel when necessary. (Any 5 × 1) (5)

2.2 Only moderate tension should be applied to the tape when measuring,✓ and care should be taken to ensure that the tape is not twisted or looped✓ when taking the measurement.✓ (3)

2.3 To prevent injury to the hands✓ and also to improve control over the file by creating a firm grip✓ (2)

[10]

QUESTION 3: METALS AND MATERIALS

3.1 3.1.1
- Rustproof
- Fairly soft to work with
- Bends easily
- Malleable (Any TWO)

3.1.2
- Rustproof
- Very soft
- Malleable (Any TWO)

3.1.3
- Rust resistant
- Hard
- Bends easily (Any TWO)

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3.1.4
- Very light
- Very soft
- Malleable
- Bends easily
- Rustproof

(Any TWO) (4 × 2) (8)

3.2
- Galvanisation
- Paint
- Bitumen
- Enamelled iron

(Any 2 × 1) (2)

[10]

QUESTION 4: SOLDERING AND WELDING

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 from combustible litter.
- Welding work areas should be well ventilated to remove fumes.
- Never use acetylene or Handigas cylinders placed in a horizontal position.

(Any 4 × 1) (4)

4.2
4.2.1 Equal quantities of oxygen and acetylene
4.2.2 Excess of acetylene
4.2.3 Excess of oxygen

(3 × 1) (3)

4.3 Earth cable (1)

[8]

QUESTION 5: COLD-WATER SUPPLY

5.1 In a direct cold-water system the water is supplied directly to a dwelling from local authority supply mains, while in an indirect cold-water system the water is supplied from local authority supply mains, but fed to the storage tank and then from the storage tank to draw-off points. (2 + 2) (4)

5.2
- Rainwater
- Wells
- Rivers
- Springs
- Upland surface water

(Any 4 × 1) (4)

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5.3
- Precipitation✓ occurs when water vapour in the atmosphere condenses into clouds and falls to the earth in various forms, e.g. rain, snow, ice, pellets and hail.✓✓
- Percolation and run off✓ refer to water that flows down streams and rivers and is not constant.✓✓
- Evaporation is the processes through which water enters the ocean and on land changes to vapour and enters the atmosphere as gas. The evaporation from plants is called transpiration.✓ (3 × 3) (9)

[17]

QUESTION 6: HOT-WATER SUPPLY

6.1 Cold water enters the geyser at the bottom.✓ The geyser is heated by means of an element which switches on and off as the required temperature is reached.✓ Hot-water outlets is at the top.✓ When hot water is needed, a stopcock on the cold-water feed is opened and this cold water forces the hot water out at the top of the draw-off point.✓ No expansion pipe is needed, as the hot-water draw-off serves as an expansion pipe.✓ No taps/valves may be installed on hot-water draw-off pipes.✓ (Any 5 × 1) (5)

6.2 There is no supply tank.✓ The geyser works on a pressure-control valve directly from the main supply.✓✓ (3)

6.3 No,✓ the tap must be installed as the geyser can explode,✓ due to no termination of hot-water draw-off points.✓ (3)

6.4 Through sunrays (1)

[12]

QUESTION 7: DRAINAGE

7.1
7.1.1 Nonexcremental liquid discharged from waste-water fittings

7.1.2 Excremental liquid discharged from soil-water pipes

7.1.3 Any pipe connected to any waste/soil pipe and used for the conveyance of waste or soil water to any soil stack or drain

7.1.4 Waste water, soil water or other liquid waste, excluding storm/fresh water

(4 × 2) (8)

7.2 Clay (1)

7.3 Flexible telescopic joint (1)

7.4 Yes,✓ they have their own moulded collar joints.✓ (2)

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

7.6 Sockets (rubber ring and cement welded joints) (1)

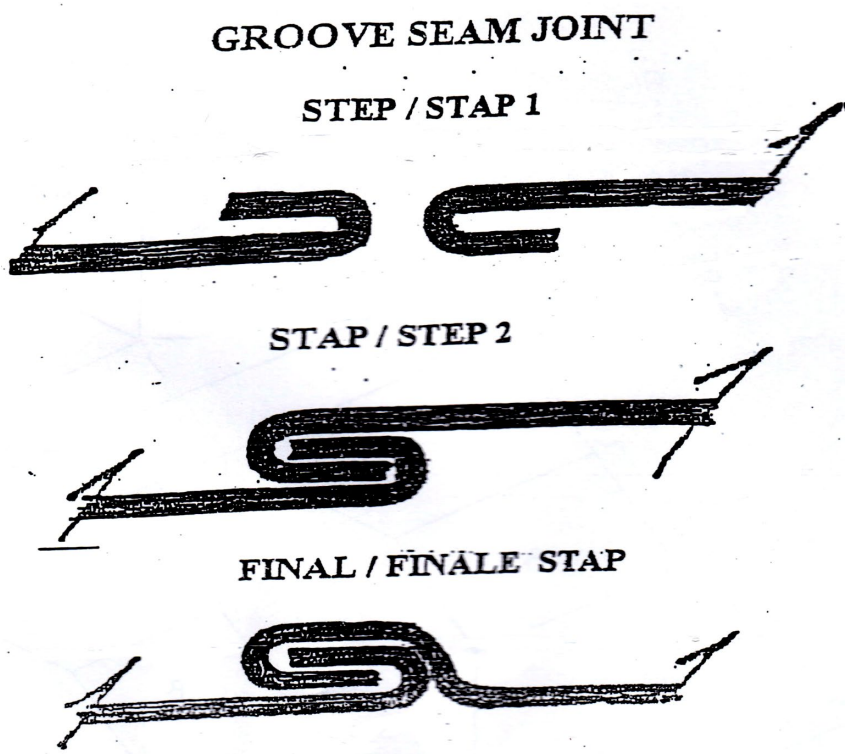
7.7 All pipes must be cut square with a fine-toothed saw. (2)

7.8 Yes,✓ because of its durability/hardness/toughness. (2)

7.9 Impregnating wood fibre with pitch (1)
[20]

QUESTION 8: SHEET-METAL WORK

8.1



(2 marks for each sketch) (6)

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

8.3
- Front flashing
- Back flashing
- Side flashing
- Stepped flashing
- Apron flashing

(Any 4 × 1) (4)
[12]

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QUESTION 9: CALCULATIONS

9.1 Data: Length = 3,5 m
Width = 1,5 m
Height = 1,2 m

V = L × W × H
= 3,5 × 1,5 × 1,2✓
= 6,3 m^3✓

9.2 0,001 m^3 water = 1 ℓ and one litre of water has a mass of 1 kg

6,3/0,001✓
= 6 300 ℓ✓

9.3 6 300 × 1 kg✓
= 6 300 kg✓

(3 × 2) **[6]**

TOTAL: 100

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