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higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLUMBING THEORY N1

31 JULY 2018

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QUESTION 1: SAFETY AND HOUSEKEEPING

1.1 1.1.1 CO_2
1.1.2 Foam
1.1.3 Water
(3 × 1) (3)

1.2 A minimum of 75 mm✓ and a maximum of 200 mm.✓ (2)
[5]

QUESTION 2: TOOLS AND MACHINE

2.1 Guillotine (1)

Safety measures:
- Finger guard should be provided for the blade
- Machine should be tightly secured to the floor
- Moving parts should be well oiled (Any 2 × 1) (2)

2.2
- prohibition signs✓ – circular shape✓
- mandatory signs✓ – circular shape✓
- warning signs✓ – triangular shape✓
- information signs – square oblong✓
- fire signs✓ – square or triangular or rectangular✓ (8)

[11]

QUESTION 3: METALS AND MATERIALS

3.1 It is made of copper✓ and it is malleable,✓ ductile✓ and conductive.✓ (4)

3.2
- galvanising
- paint
- bitumen
- enamelled iron (4)

[8]

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QUESTION 4: SOLDERING AND WELDING

4.1 Gas welding:
- Gas cylinders (acetylene and oxygen)
- Regulators
- Rubber hoses
- Mixer (blow pipe and nozzle)
- Welding rods
- Flash back arrestor

Arc welding:
- Electrode holder
- Earth clamp
- Welding machine
- Electrodes (Any 2 × 4) (8)

4.2
- The high pressure system
- The medium- pressure system
- The low-pressure system (3)

[11]

QUESTION 5: COLD WATER SUPPLY

5.1 5.1.1 pillar tap (1)

5.1.2 bath/hand wash basin (1)

5.1.3
1 packing gland nut
2 packing
3 jumper or valve plate
4 washer (4)

5.2
- Safe to drink
- Attractive in appearance (sparkling)
- Free of taste
- Free of odour
- Usable in a variety of household and industrial purposes. (Any 3 × 1) (3)

5.3 Water hammer refers to the incessant knocking√ and vibrating sound in pipework. (2)

5.4 5.4.1 Portion of pipe from service mains to behind the meter

5.4.2 Portion of pipe between meter and premises

5.4.3 Pipe from service mains to the premises

(3 × 1) (3)

[14]

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QUESTION 6: HOT WATER SUPPLY

6.1 Advantages
- It takes up little space
- It reduces labour and material costs
- The valve is easily accessible for repairs

Disadvantages
- It is very expensive when faulty
- It malfunctions when grains of sand filters through the system.
- Those made of plastic can easily break when not handled with care.

(Any 2 × 2) (4)

6.2
- To lay pipe underground, deep enough or below frozen ground surface.
- To put a layer of lagging around the pipe.
- Lay pipes in cavity walls. (Any 2 × 1) (2)

6.3 By the sun✓ (1)

6.4 This geyser has a built in cold water storage tank which is automatically controlled by a ball valve with supply coming directly from the mains✓ and the supply pipe delivers cold water into the cylinder for heating by the element.✓ When the water is hot enough as per the setting on the thermostat it then supplies hot water to draw-off points.✓ (3)

6.5 Advantages:
- A decrease in electricity consumption is more environmentally friendly
- Solar (sun) energy is used to heat the water

Disadvantages:
- Not very affective in periods of no direct sunlight-(cloudy periods)
- Costly installation.
- Unsightly on roofs.
- Added weight to roof structure. (Any 2 × 1) (2)

[12]

QUESTION 7: DRAINAGE

7.1
- Close-coupled suite
- The low-level suite
- The high-level suite (3)

7.2 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)

7.3 It is the principle of connecting the individual water seal traps,✓ from a sanitary fixture, to a ventilated drain✓ or other ventilated pipe which leads into the open air.✓ (3)

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7.4 7.4.1 Anti-siphon pipe
7.4.2 Bidet
7.4.3 French drain
7.4.4 Gully

(4 × 1) (4)

7.5 One pipe system where all the soil water fixtures✓ and waste-water fixtures discharge into a single stack connected directly to drain.✓

Two pipe system all waste fixtures discharge separately into an open waste stack that discharge into a gully✓ and all soil fixtures discharge directly into drain.✓ (2 × 2) (4)

7.6
- Be self-cleaning
- Have an adequate water seal
- Be of uniform bore
- Not corrode
- Be of same diameter as waste pipe
- Simple in design and free of angles (Any 4 × 1) (4)

[20]

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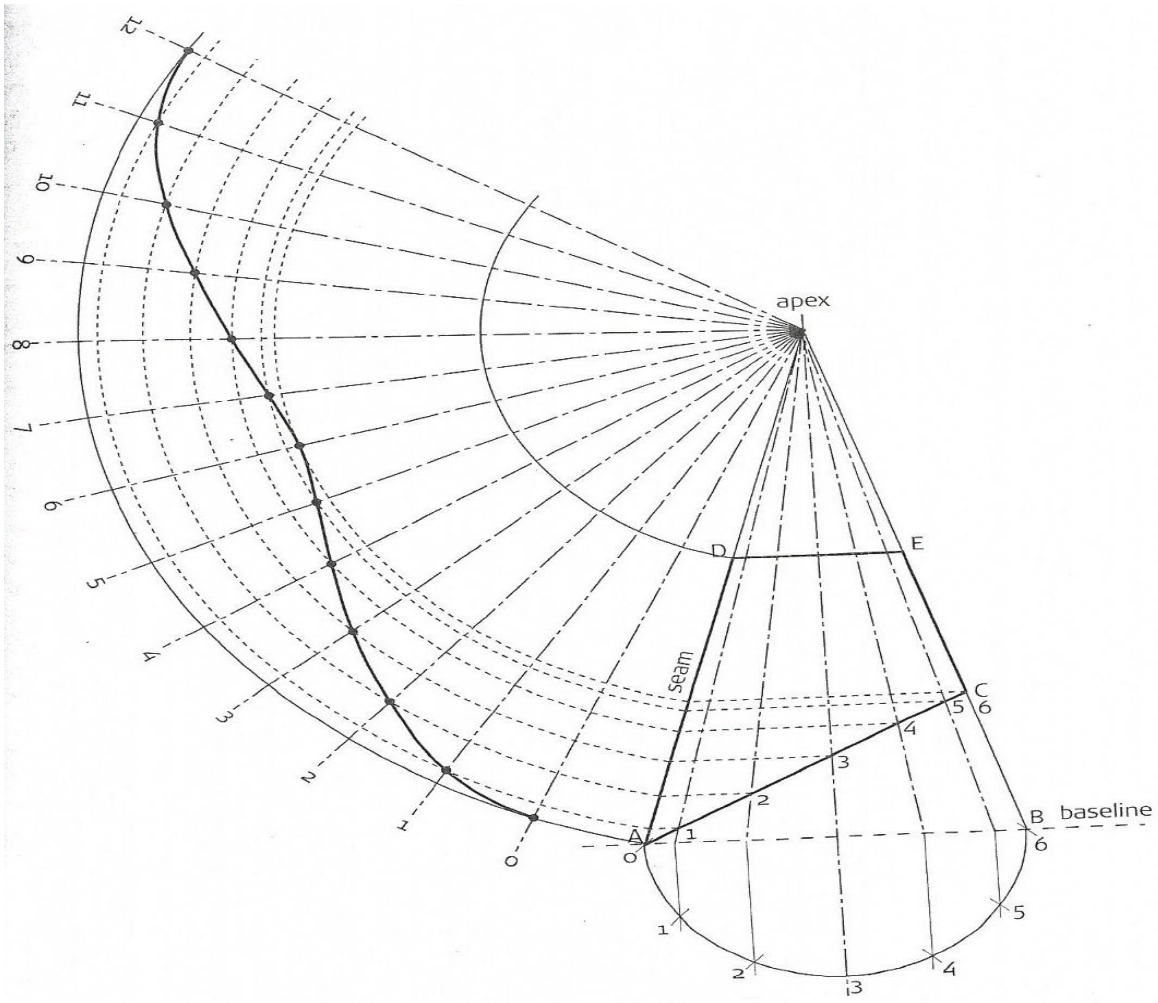
QUESTION 8: SHEET METAL WORK



Distribution of marks:

Elevation	2
Scale	1
Pattern	7
Neatness	2
TOTAL MARKS:	12

[12]

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QUESTION 9: CALCULATIONS

9.1 Fall of pipe = Length × Fall ratio✓
= 12 m × 1/28✓
= 0,429 m✓
= 429 mm✓ (4)

9.2 Invert Depth of pipe = 429✓ + 385✓
= 814 mm✓ (3)
[7]

TOTAL: 100

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