higher education & training

Department:
Higher Education and Training
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE

NATIONAL CERTIFICATE

PLUMBING THEORY N2

6 APRIL 2018

This marking guideline consists of 9 pages.

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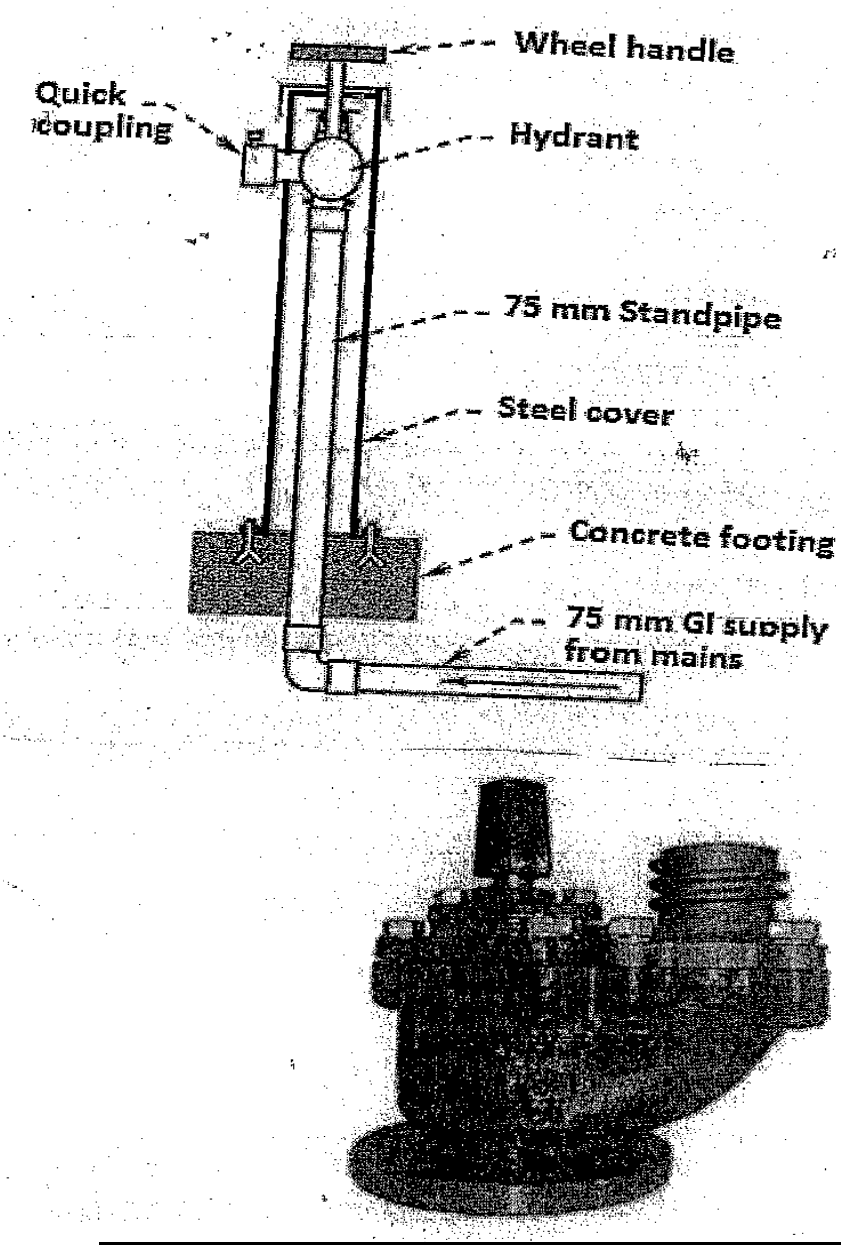
QUESTION 1: COLD-WATER SUPPLY

1.1
- At any highest point in the pipeline.
- At any point in the pipeline where the hydraulic gradient alters.
- At any point along the pipeline where airlocks may form.
- At any water supply source, such as the pump station, along a pipeline.
- At various points in a very long pipe gradient. (Any 2 × 1) (2)

1.2 1.2.1



Correctness	4
Labelling	4
Pillar and underground	2
TOTAL	10

(10)

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1.2.2
- To provide water to emergency services to wash streets, e.g. after accidents.
- To provide access to fill municipal water tanks.
- To provide access for municipal workers to use water off a metered standpipe.
- To be used as a temporary connection with the consent of city engineers. (Any 3 × 1) (3)

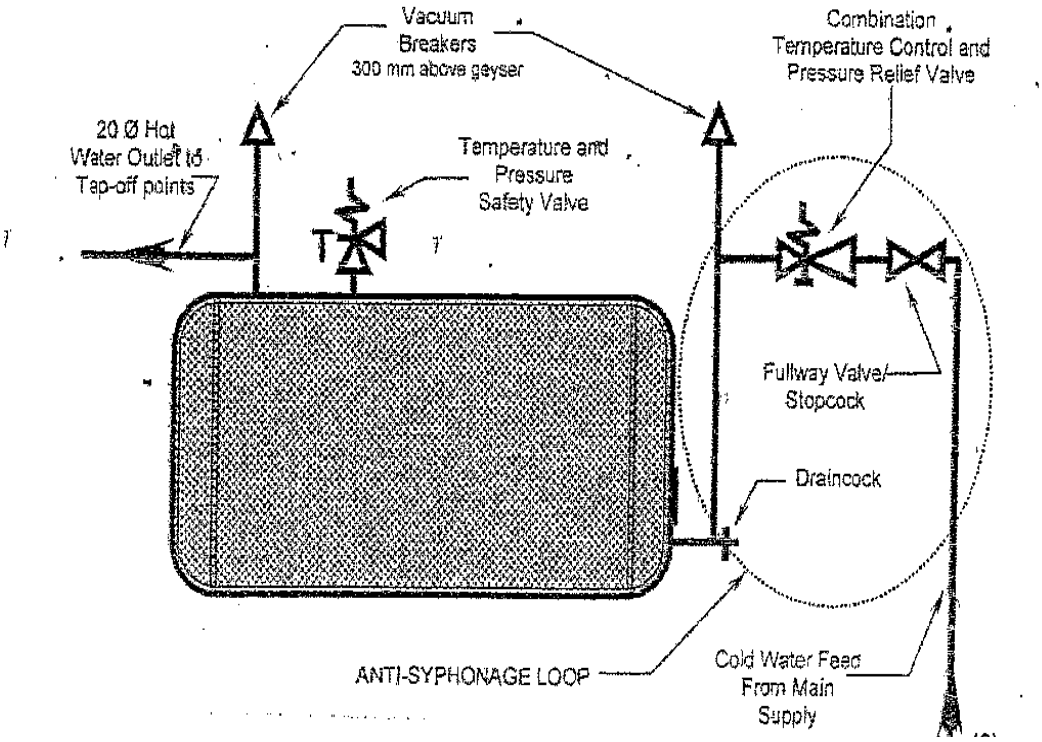
1.3 1.3.1
- This system is more economical as far as installation costs, operating costs and maintenance costs are concerned.
- This system is more reliable and ensures a much more constant supply.
- A constant pressure is ensured. The only fluctuations of pressure at terminal fittings will occur at peak demands and changes of water level in the service reservoir. (3)

1.3.2
- It is used if the control reservoir is higher than the service reservoir.
- In isolated cases, the reservoir is higher than the building or the house to be served. (2)

[20]

QUESTION 2: HOT-WATER SUPPLY

2.1



ALLOCATION OF MARKS:

Correctness	3
Labelling	3
Pipes and valves	2
TOTAL	8

(8)

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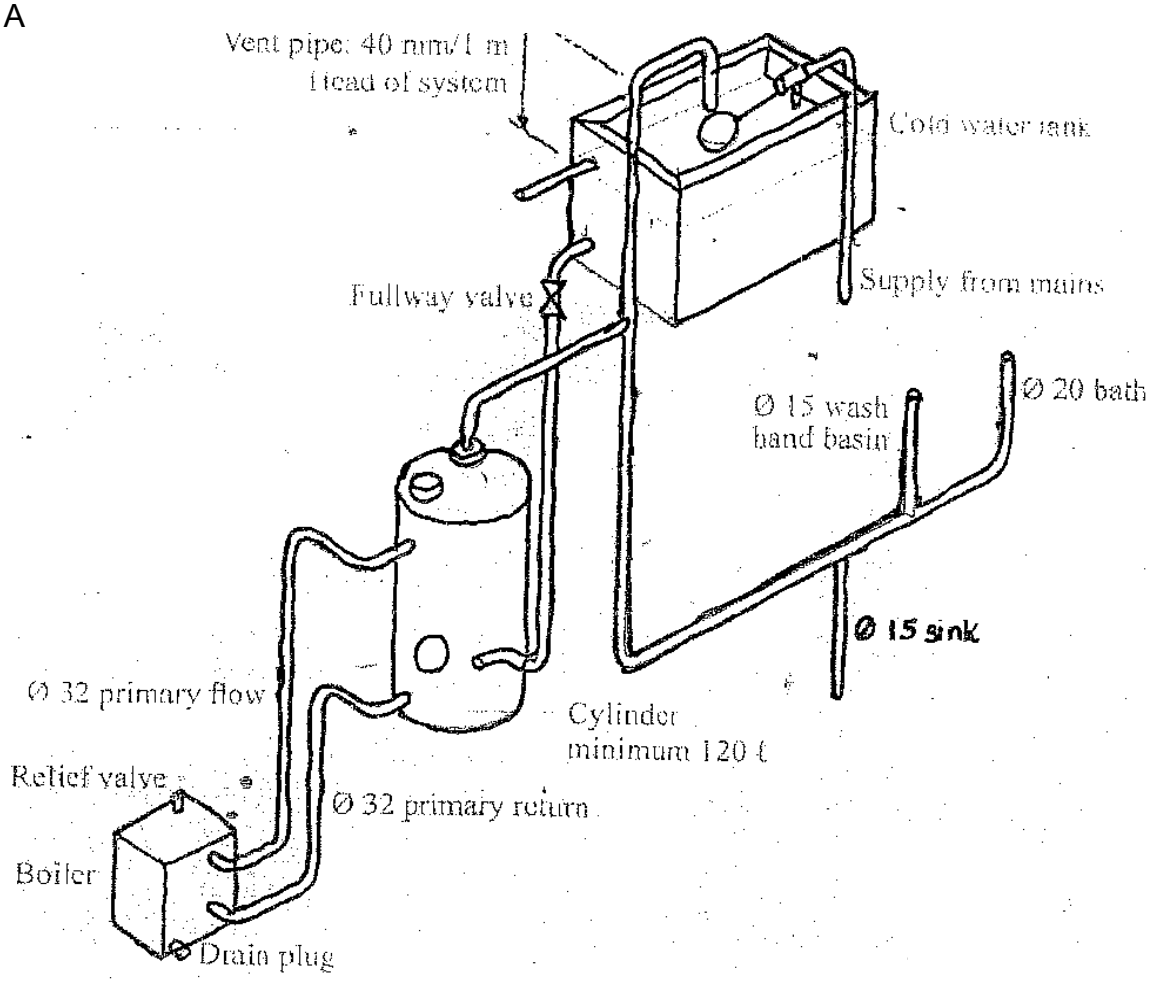
2.2 A



Boiler and Cylinder with supply tank

ALLOCATION OF MARKS:

Correctness	4
Cold-water supply and storage tank	2
Boiler and a cylinder	2
Vent pipe	2
TOTAL	10

(10)

2.3 The horizontal geyser receives its water directly from the service pipe,✓ whereas the boiler receives the water from the service pipes, but via a cylinder.✓ (2)

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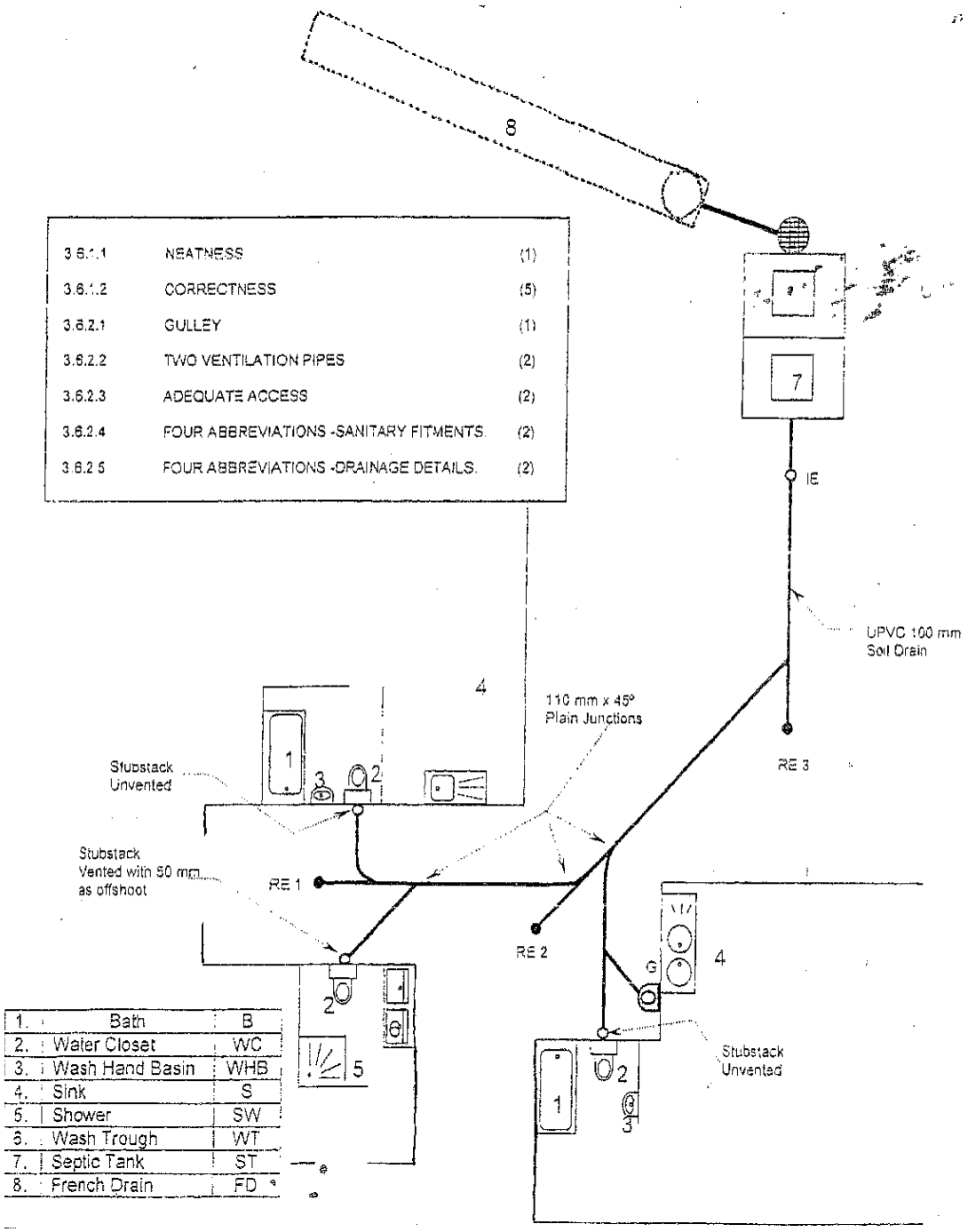
QUESTION 3: DRAINAGE

3.1



3.6.1.1	NEATNESS	(1)
3.6.1.2	CORRECTNESS	(5)
3.6.2.1	GULLEY	(1)
3.6.2.2	TWO VENTILATION PIPES	(2)
3.6.2.3	ADEQUATE ACCESS	(2)
3.6.2.4	FOUR ABBREVIATIONS -SANITARY FITMENTS.	(2)
3.6.2.5	FOUR ABBREVIATIONS -DRAINAGE DETAILS.	(2)

(15)

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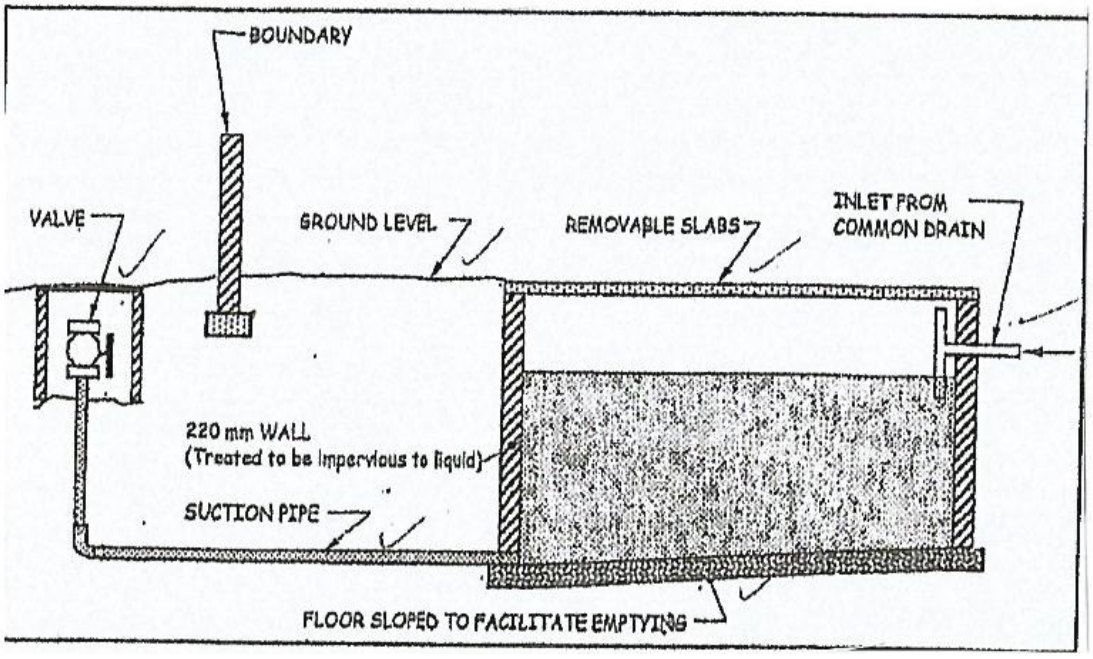
3.2



ALLCATION OF MARKS

Correctness	3
Labelling	5
TOTAL	8

(8)

3.3 Single-stack system refers to a system in which both soil and waste waters✓ are conveyed from the sanitary fixtures via a common soil✓ and waste discharge stack to the underground drain; this system is not ventilated as extensively as the one-pipe system✓ and special care must be taken with the nominal diameter and depth of water seals in traps.✓ (4)

3.4 In cases where the drain pipe may be subjected to heavy vehicular loadings, reinforced precast or cast in-situ concrete slabs of thickness 100 mm and wide enough to prevent excessive superimposed loads from being transferred direct to the pipe shall be placed over the drain.✓ The concrete slab shall be isolated from the crown of the pipe by a soil cushion of at least 100 mm thickness or by means of synthetic material of sufficient thickness.✓ In all other cases not referred to in the above statement, concrete slabs, bricks or paving blocks of thickness of at least 50 mm shall be placed over such drain.✓ The concrete slabs shall be isolated from the crown of the pipe by a soil cushion of at least 50 mm thickness or by the means of synthetic material of sufficient thickness.✓ (3)

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3.5 Fall of pipe = length × fall ratio
= 18m × 1/30✓
= 0,6 m
= 600 mm✓

Invert depth of a pipeline
= 620 + 600✓
= 1 220 mm✓
= 1,22 m✓ (5)
[35]

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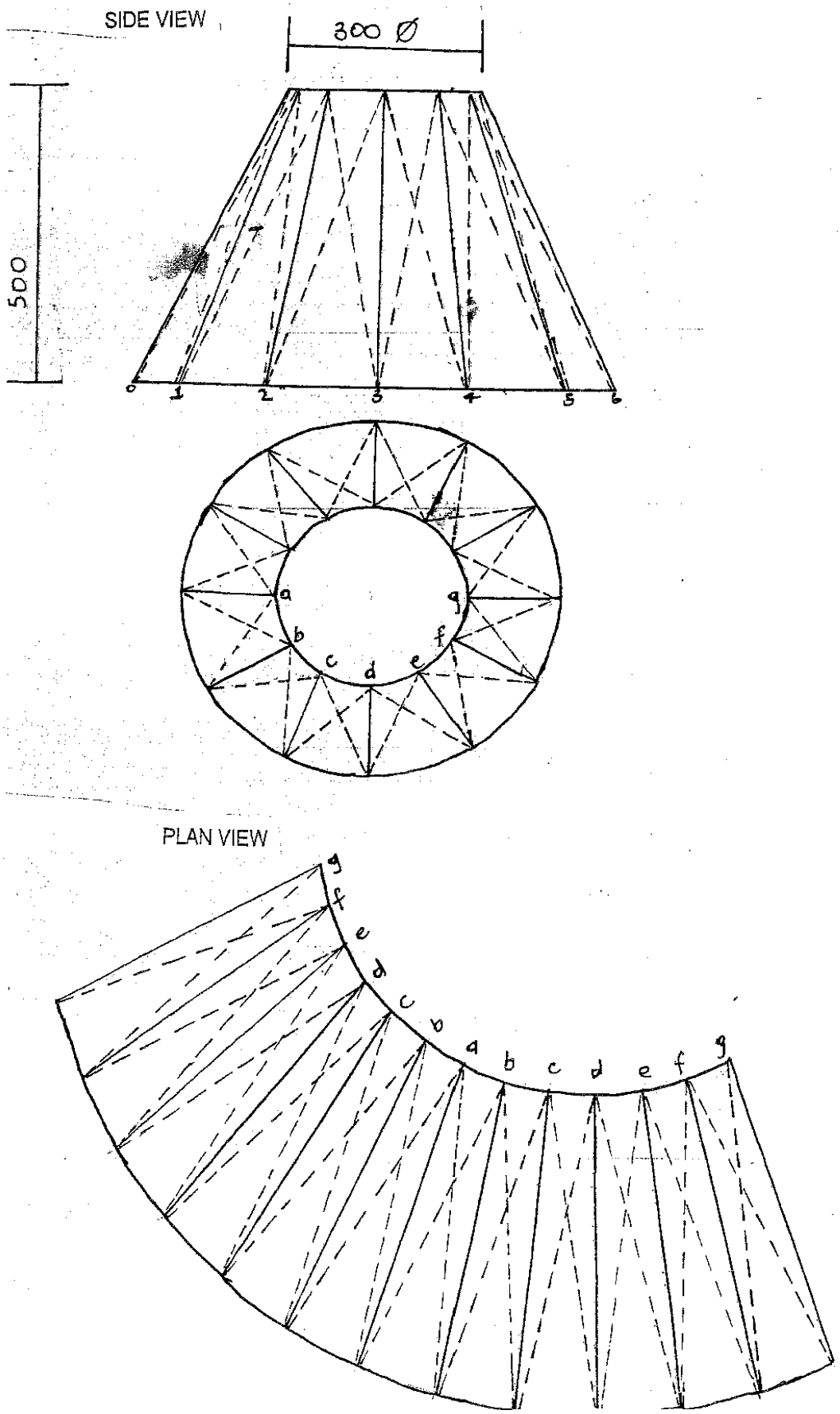
QUESTION 4: SHEET-METAL WORK AND FLASHING



[15]

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QUESTION 5: CALCULATIONS

DESCRIPTION	QUANTITY
22 mm copper pipe	4 m–5 m
15 mm copper pipe	0,4 m–1 m
22 mm equal T-piece	2
22 mm × 15 × 22 T-piece	1
22 mm × 22 × mm 15 mm T-piece	1
22 mm stop cock	1
22 mm c-c combination pressure control and release valve 22 mm	1
22 mm vacuum breakers	2
100 litres × 400 kPa horizontal geyser complete with drain cock and TP safety valve	1

[10]

ALLOCATION OF MARKS	
CORRECT DESCRIPTION:	5
CORRECT QUANTITIES:	5
TOTAL:	10

TOTAL: 100

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