

POSSIBLE ANSWERS FOR:

PLUMBING AND SHEET METAL WORK

TIME: 3 HOURS

MARKS: 200

QUESTION 1

WATER PURIFICATION

1.1 ~~SIX~~ areas where water pollution may occur in the water supply chain:

- 1.1.1 the source
- 1.1.2 from the source to the catchment area
- 1.1.3 from the catchment area to the temporary reservoirs
- 1.1.4 at the distribution reservoir
- 1.1.5 defective distribution system
- 1.1.6 leakage in the sewerage system
- 1.1.7 leakage in the sewerage sludge system

Any Six (6)

1.2 Five organisms that pollute water

- 1.2.1 bacteria
- 1.2.2 floating organism
- 1.2.3 floating anorganic pollutants
- 1.2.4 dissolved organism
- 1.2.5 dissolved anorganic pollutants
- 1.2.6 fungi and algae

Any five (5)

1.3 Three main types of filters used for water purification:

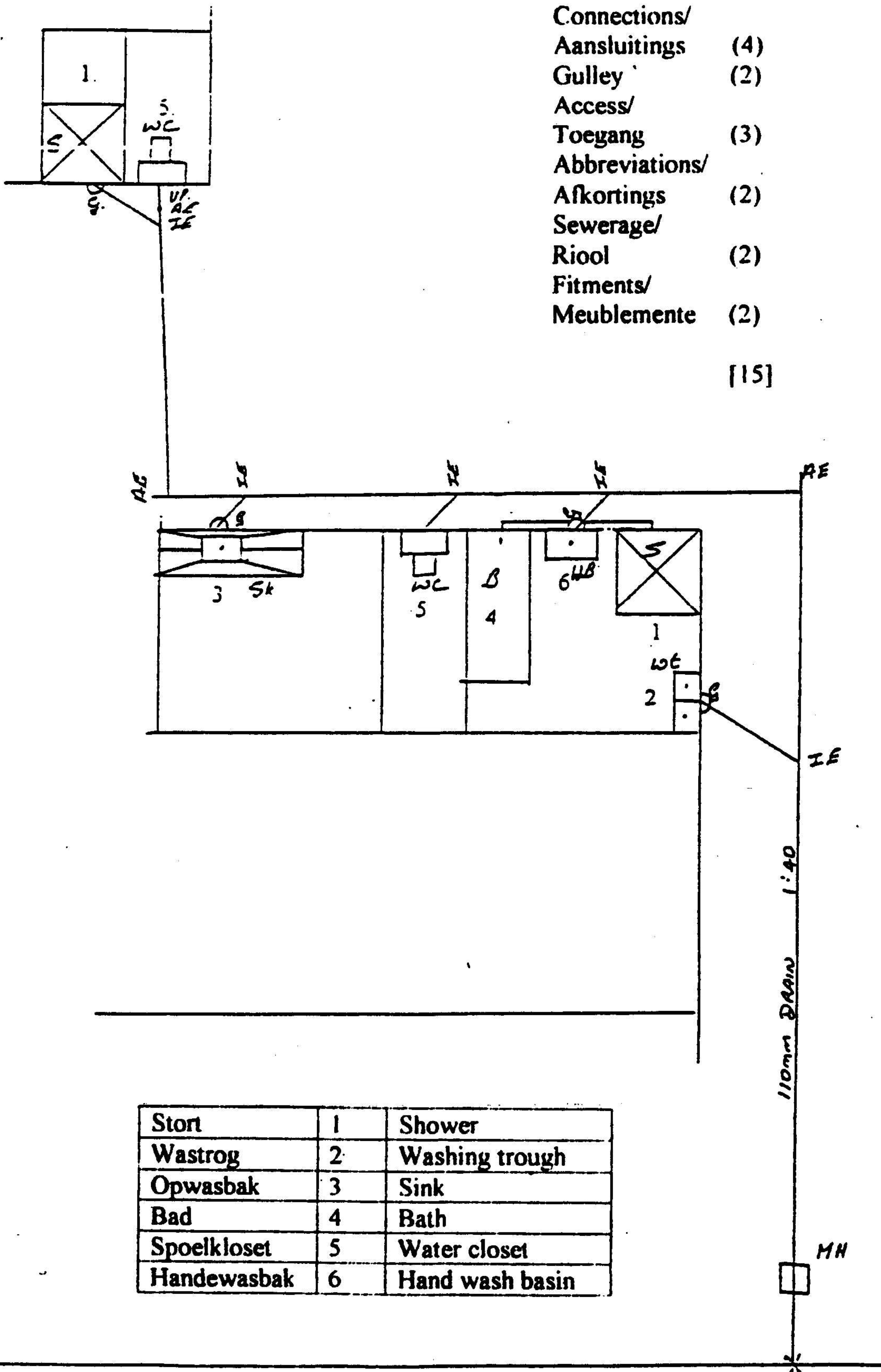
- 1.3.1 slow sand filter
- 1.3.2 quick sand filter
- 1.3.3 mechanical filter

(3)

1.4 How is water polluted in a swimming pool?

- 1.4.1 filth from dirty shoes is carried into the swimming pool area and the cloakrooms
- 1.4.2 by means of dirty feet
- 1.4.3 by means of a dirty body

SECTION OF HOUSE PLAN
GEDEELTE VAN HUISPLAN



Stort	1	Shower
Wastrog	2	Washing trough
Opwasbak	3	Sink
Bad	4	Bath
Spoelkloset	5	Water closet
Handewasbak	6	Hand wash basin

- 1.4.4 by means of excretion
- 1.4.5 by means of urination
- 1.4.6 mucus from the nose
- 1.4.7 spit (phlegm)

Any five (5)

1.5 What is the purpose of "backwashing" and how is it done?

- Purpose:
- 1. To clean the clogged filter layers
 - 2. To normalize the running of the filter

- Method:
- 1. Filtered water is pumped through the filter in the opposite direction.
 - 2. The sediment is now pumped out of the filter (4)

1.6 Why is water aerated?

1.6.1 clear and sparkling water

1.6.2 Gases are replaced and the taste improved (2)

QUESTION 2

SEWERAGE

2.2 Various other important aspects to pay attention to:

- 2.2.1 sewerage should be laid according to the approved plan
- 2.2.2 the sewerage system should be laid in a straight line and on a reliable level
- 2.2.3 the sewerage should be laid according to the approved slope
- 2.2.4 the sewerage should be laid on solid ground
- 2.2.5 the minimum sewerage depth of 600mm should not be exceeded
- 2.2.6 the necessary provision should be made to make the system accessible
- 2.2.7 the necessary concrete reinforcement is provided according to regulations

Any five – two marks each (10)

QUESTION 3

3.1 Implementation of industrial housekeeping:

- 3.1.1 a place for everything and everything in its place
- 3.1.2 the workshop should be neat and effectively organized
- 3.1.3 floors and corridors should be clear
- 3.1.4 material should be safely and suitable packed (4)

3.2 Safety precautions when using each of the following:

3.2.1 Treadle guillotine

3.2.1.1 ascertain that the finger guard is in position

3.2.1.2 use a suitable object to assist in clamping small pieces of sheet metal

3.2.1.3 should two or more people use the machine, the necessary arrangements for its use should be made (3)

3.2.2 Oxyacetylene welding apparatus

3.2.2.1 use effective welding goggles

3.2.2.2 open cylinder valves slowly

3.2.2.3 do not point open flames at any person or cylinder

3.2.2.4 stand the cylinders vertically and make sure they are well supported

3.2.2.5 pipes must be in a good condition (5)

3.3 To solve the problem of a leaking tap:

3.3.1 shut the water off at the main water supply.

3.3.2 unscrew the top section of the tap and remove the plunger and washer.

3.3.3 replace the washer and re-assemble the tap.

3.3.4 open the water supply to test the tap for leaks. (4)

3.4 Safety measures to prevent the possible transmitting of Aids in the workshop:

3.4.1 treat all blood as if it were infected.

3.4.2 first aid kits which include protective gloves are available in the workshop

3.4.3 employees must be trained to prevent HIV transmission when helping an injured person. (6)

3.5 Three causes of accidents in the workshop

3.5.1 unsafe acts

3.5.2 unsafe conditions

3.5.3 unforeseen circumstances (3)

QUESTION 4

TOOLS, WORKING TECHNIQUES AND METHODS

4.1 A – correct method of starting a saw cut

B – flat surface is obtained by using the draw file method

C – marking out rectangles

D – cutting sheet metal

E – bending of sheet metal

- F – soldering work
 - G –drilling holes
 - H –chiselling
 - I – heating up the soldering iron
 - J – marking off angles
 - K – measuring
 - L – marking out rectangles
- (12)

- 4.2
- 1 - hacksaw
 - 2 - file
 - 3 – tri square
 - 4 – tinsnip
 - 5 - hammer
 - 6 – soldering iron
 - 7 – electric cable
 - 8 – twist drill
 - 9 - chisel
 - 10 – gas burner
 - 11 - protractor
 - 12 - ruler
 - 13 – engineer's square
- (13)

QUESTION 5

5.1 Regulating the intervals between each flushing of an automatic cistern:

- 5.1.1 by setting the tap slower or faster
 - 5.1.2 the intervals are lengthened or shortened
- (2)

5.2 Where and for what purpose are slop hoppers used:

Where: hospitals
clinics
hostels
large office buildings

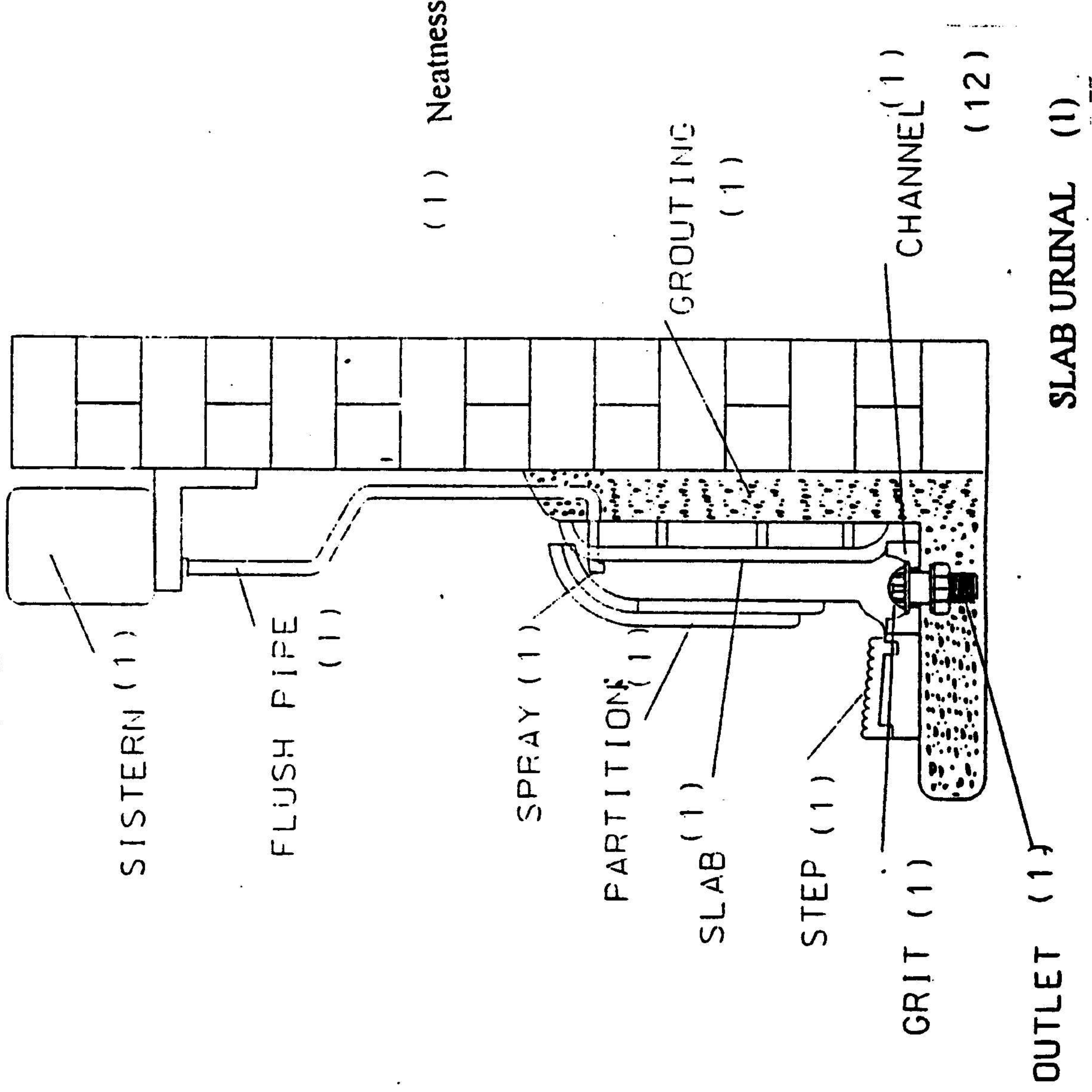
Purpose: emptying and purification of slop buckets

(5)

5.4 Steps that can be taken to prevent the spreading of cholera:

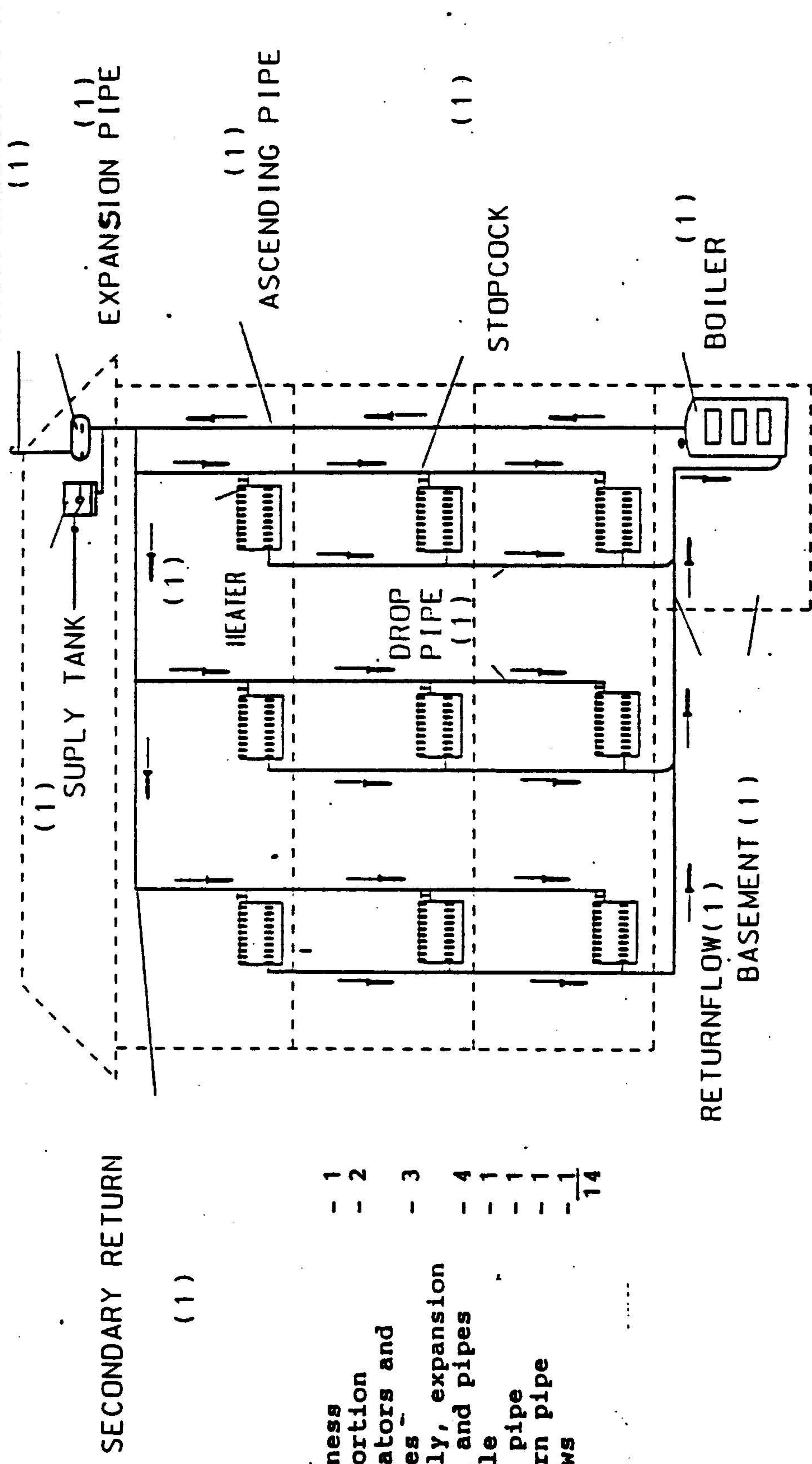
- 5.4.1 drink only tap, boiled or treated water
- 5.4.2 store water in clean, sealed containers
- 5.4.3 wash all raw food such as fruit and vegetables with clean, treated or boiled water
- 5.4.4 wash hands before preparing or eating food
- 5.4.5 protect food from fly contamination
- 5.4.6 use proper toilet facilities and wash hands after going to the toilet

QUESTION 5.3



(1) Neatness

QUESTION 6.1



- Neatness - 1
- Proportion - 2
- Radiators and valves - 3
- Supply, expansion tank and pipes - 4
- Kettle - 1
- Flow pipe - 1
- Return pipe - 1
- ARROWS - 1
- 14

THE TWO-PIPE DROP SYSTEM

NEATNESS (1)

5.4.7 do not contaminate rivers or dams or leave sewerage where it can be washed into rivers by rain.

5.4.8 do not allow children to play in dirty rivers, dams or pools. Any six (6)

QUESTION 6

CENTRAL HEATING

6.1 The principles of heating and the application thereof in a central heating system:

6.1.1 Radiation (1)

- (i) the fire radiates heat to the metal casing of the boiler.
- (ii) heaters radiate heat to the immediate environment. Any one – 2 marks(2)

6.1.2 Conduction (1)

- (i) heat from the fire is conducted to the water by means of the metal casing .
- (ii) heat is conducted from the metal casing to the water .
- (iii) heat from the heater is conducted from the metal casing to the surrounding area . Any one – 2 marks (2)

6.1.3 Convection (1)

- (i) the hot water in the boiler flows by means of convection currents along the pipes to the heater .
- (ii) water that has cooled down flows by means of convection currents in the return pipes to the boiler to be reheated .
- (iii) hot air, heated by means of radiation is distributed by means of convection currents, to heat the room. Any one – 2 marks (2)

6.3 Two methods to arrange the pipes of a central heating system:

- (i) one-pipe system
- (ii) two-pipe system (2)

QUESTION 7

VENTILATION AND CENTRAL AIR CONDITONING

7.1 Name in sequence, six important stages in the treatment of air in a large air conditioning system:

Extractor fans (1)

Power driven extractor fans draw in air and discharge it into the system which is Distributed in the building. (1)

Moisture (1)

Air passes through mist or a water screen to increase the moisture content. (1)

Primary filters (1)

Filters consist of replaceable covers removing dust and other impurities from the air. (1)

Moisture absorbing (1)

To reduce the moisture content, the air passes through a metal screen. The excessive water condensates. (1)

Highly efficient filters (1)

It consists of replaceable carbon-activated filters which remove dust, odours and impurities. (1)

Heating of air (1)

Depending on the weather conditions, air temperature is automatically controlled by means of thermostats. (1)

7.2 Ventilation systems for:

7.2.1 school classroom – natural ventilation

7.2.2 the kitchen of a hostel – extract fans

7.2.3 a large theater – combined air conditioning system Two marks each (6) ✓

7.3 Three aids which could assist the natural ventilation of a building:

7.3.1 doors

7.3.2 windows

7.3.3 ventilators

7.3.4 air bricks

7.3.5 chimneys

7.3.6 louvers

Any three (3) ✓

7.4 The major advantage of natural ventilation over mechanical ventilation:

It is much cheaper

(1)

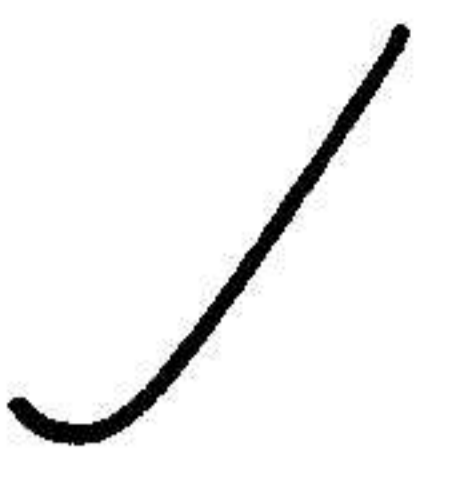
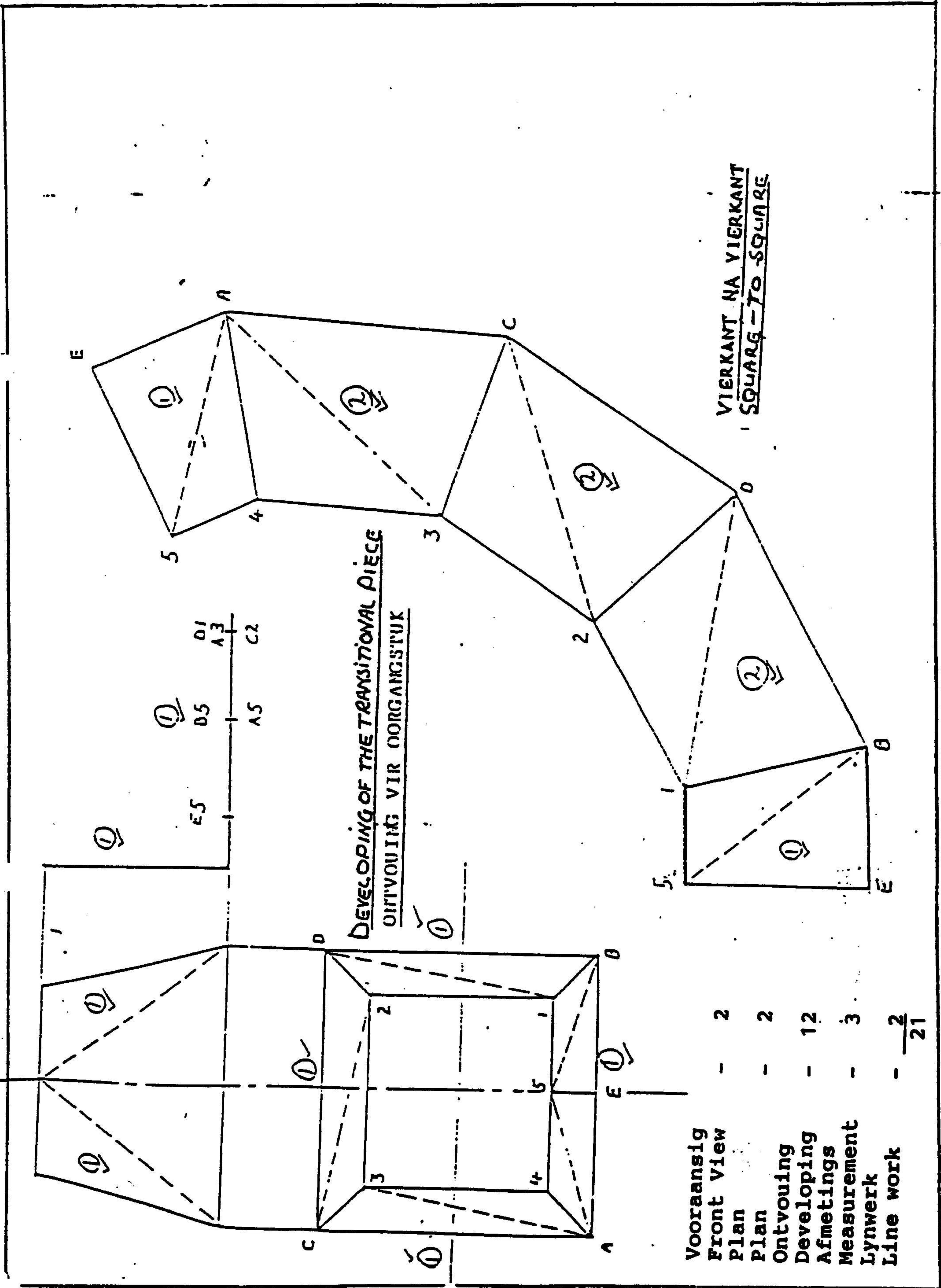


FIG 1



VIERKANT NA VIERKANT
SQUARE - TO - SQUARE

MOONTLIKE ANTWOORDE VIR:**LOODGIETERY- EN PLAATMETAALWERK****TYD: 3 UUR****PUNTE: 200****VRAAG 1****WATERSUIWERING****1.1 SES areas waar water in die watertoevoerketting besoedel kan word.**

- 1.1.1 by die bron
- 1.1.2 by die bron na die opvang gebied
- 1.1.3 van die opvang gebied na die tydelike reservoirs
- 1.1.4 by die distribusie reservoirs
- 1.1.5 defekte distribusiestelsel
- 1.1.6 lekkasie in die rioolnetwerkstelsel
- 1.1.7 lekkasie in die rioolslykinstallasie

Enige ses (6)**1.2 Vyf stowwe wat water kan besoedel**

- 1.2.1 bakterieë
- 1.2.2 drywende organisme
- 1.2.3 drywende anorganiese onsuierhede
- 1.2.4 opgeloste organiese onsuierhede
- 1.2.5 opgeloste anorganiese onsuierhede
- 1.2.6 fungi en alge

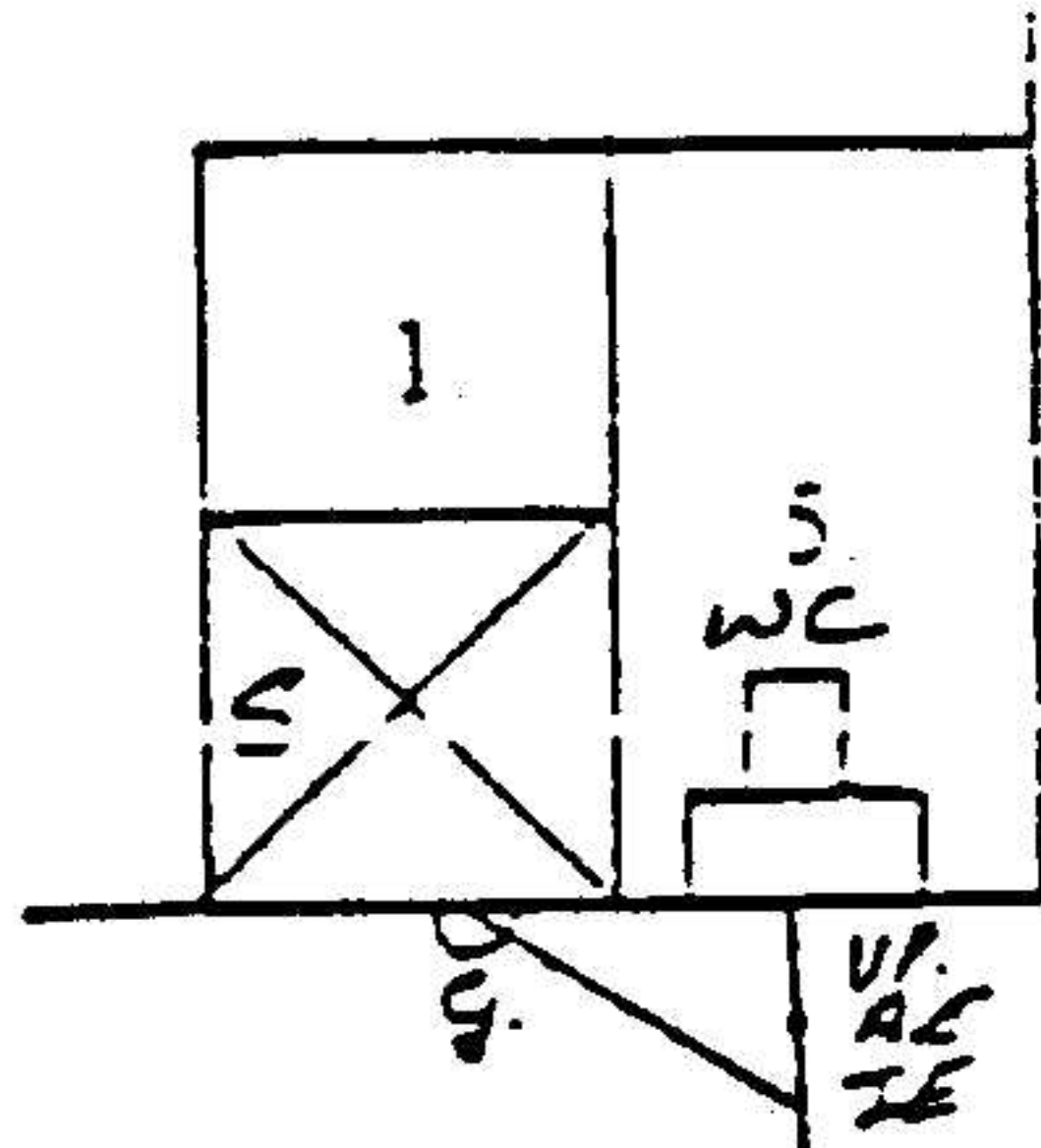
Enige vyf (5)**1.3 Noem die drie soorte filters**

- 1.3.1 stadige filters
- 1.3.2 vinnige filters
- 1.3.3 meganiese filters

Een punt elk (3)**1.4 Hoe word swembadwater besoedel?**

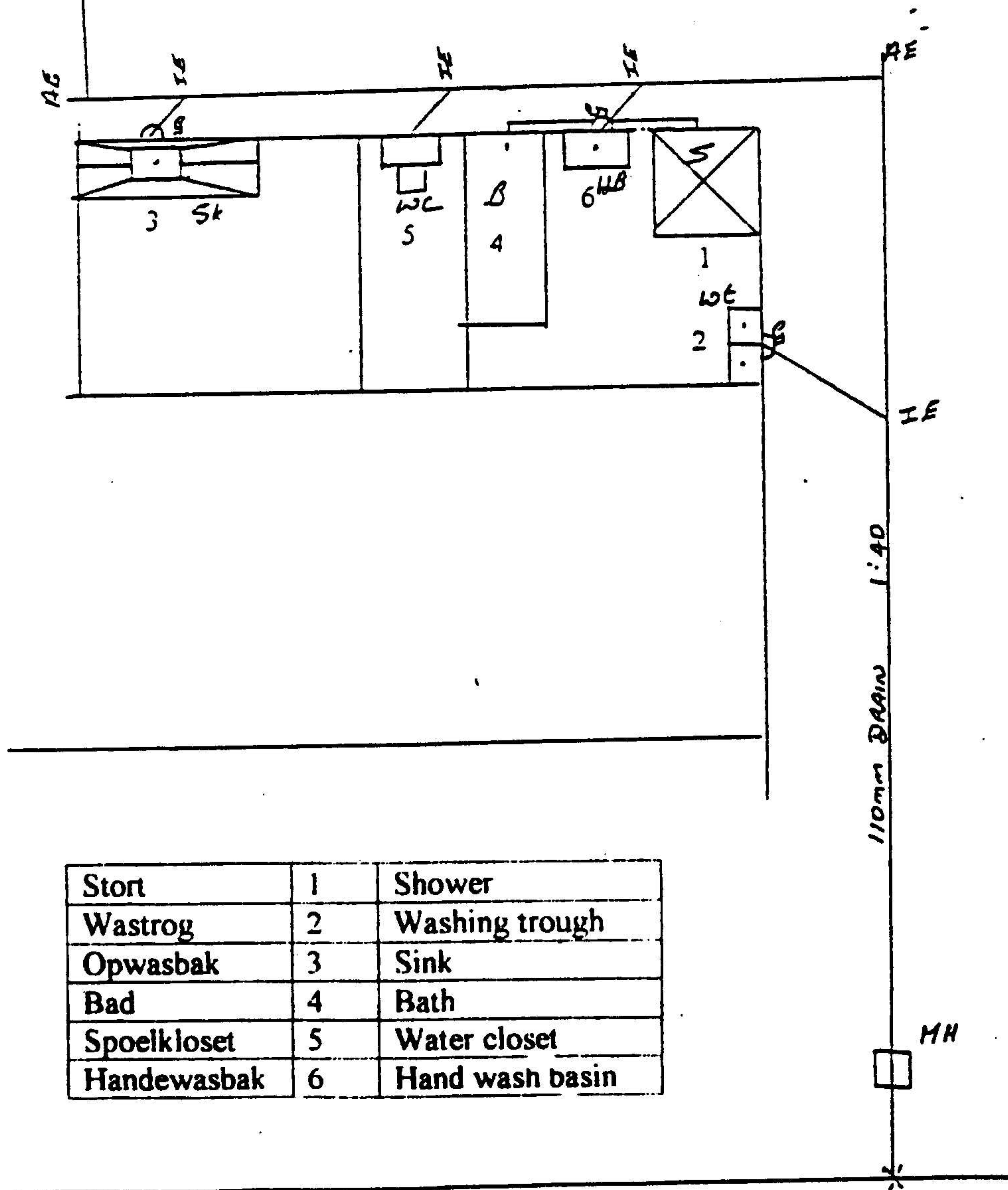
- 1.4.1 besoedeling word deur vuil skoene in die swembad gebied en kleedkamers ingedra
- 1.4.2 deur middel van vuil voete
- 1.4.3 deur middel van 'n vuil liggaam

SECTION OF HOUSE PLAN
GEDEELTE VAN HUISPLAN



- Connections/ Aansluitings (4)
- Gulley (2)
- Access/ Toegang (3)
- Abbreviations/ Afkortings (2)
- Sewerage/ Riool (2)
- Fitments/ Meublemente (2)

[15]



Stort	1	Shower
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- 1.4.4 deur middel van uitskeiding
 - 1.4.5 deur middel van urinering
 - 1.4.6 slyn van die neus
 - 1.4.7 speeksel
- Enige vyf (5)

1.5 Wat is die doel van terugspoeling en hoe word dit gedoen?

- 1.5.1 Doel: 1 – Om die verstopte filterlae skoon te maak
2 – Om weer normale filtreertempo te handhaaf

Metode: 1 – Gefiltreerde water word in 'n teenoorgestelde rigting deur die filter gepomp
2 – Die afsaksel word nou uit die filter gepomp (4)

1.6 Waarom word water belig?

- 1.6.1 vir helder skoon water
- 1.6.2 gasse word teruggeplaas en die smaak verbeter (2)

VRAAG 2

RIOLERING

2.2 Ander aspekte van die werk waarna 'n rioleringsinspekteur ook moet kyk:

- 2.2.1 die riool volgens die goedgekeurde plan gelê
 - 2.2.2 die riool reguit gelê is en 'n getroue bodemvlak het
 - 2.2.3 die riool volgens die vereiste helling gelê is
 - 2.2.4 die riool op stewige grond gelê is
 - 2.2.5 die minimum rioldiepte van 600mm nie oorskry is nie
 - 2.2.6 voorsiening gemaak is vir toegang tot die rioolsisteem
 - 2.2.7 waar voorgeskryf, die riool met beton beskerm of versterk word
- Enige vyf – 2 punte elk (10)

VRAAG 3

3.1 Implementering van bedryfshuishouding

- 3.1.1 'n plek vir alles en alles op sy plek
- 3.1.2 die sentrum moet netjies en doeltreffend georganiseer wees
- 3.1.3 vloere en gange moet skoon wees
- 3.1.4 materiaal moet veilig en op geskikte plekke weggepak word (4)

3.2 Veiligheids maatreëls by die gebruik van die volgende:

3.2.1 Trapguillotine

- 3.2.1.1 sorg dat die vingerskerms in posisie is
- 3.2.1.2 gebruik 'n geskikte voorwerp om smal stroke plaatmetaal mee vas te klem
- 3.2.1.3 as meer as een persoon die masjien gebruik, moet daar onderlinge samewerking wees (3)

3.2.2 Die oksiasetileensweistoestel

- 3.2.2.1 gebruik 'n doeltreffende sweisbril
- 3.2.2.2 die kleppe moet stadig oopgemaak word
- 3.2.2.3 moet nie die vlam op 'n persoon of die silinder rig nie
- 3.2.2.4 maak seker dat die silinders regop staan en stewig vasgemaak is
- 3.2.2.5 maak seker dat die pype in goeie toestand is (5)

3.3.1 Sluit die hoofwatertoevoer af

- 3.3.2 Skroef die boonste gedeelte van die kraan af en verwyder die plunjer en die wasser

3.3.3 Vervang die wasser

- 3.3.4 Sluit die hoofwatertoevoer weer aan en toets die kraan vir lekkasie (4)

3.4 Veiligheids maatreëls om die verspreiding van vigs in die werkwinkel te voorkom:


- 3.4.1 behandel alle bloed asof dit moontlik besmet is
- 3.4.2 eerstehulpkissies wat beskermende handskoene en ander middels insluit moet by die werkplek beskikbaar wees
- 3.4.3 werknemers moet opgelei word om HIV infeksie te voorkom as hulle 'n beseerde persoon help (6)

3.5 Drie oorsake van ongelukke in 'n sentrum:

- 3.5.1 onveilige handeling
- 3.5.2 onveilige toestande
- 3.5.3 onvoorsiene omstandighede (3)

VRAAG 4

GEREEDSKAP, BEWERKINGSTEGNIEKE EN METODES

- 4.1 A - korrekte metode om 'n saagsnit te maak
 - B - plat oppervlakte word met 'n trekvyf verkry
 - C - uitmerk van reghoek
 - D - sny van plaatmetaal
- 

- E – buigwerk
 - F – soldeerwerk
 - G – boorwerk
 - H – koubeitel kapwerk
 - I – warm maak van soldeerbout
 - J – afmerk van grade
 - K – meetwerk
 - L – uitmerk van reghoek
- (12)

- 4.2
- 1 – ystersaag
 - 2 – vyl
 - 3 - winkelhaad
 - 4 - blikskêr
 - 5 - hammer
 - 6 - soldeerbout
 - 7 – elektriese kabel
 - 8 - boorpunt
 - 9 - koubeitel
 - 10 - gasbrander
 - 11 – gradeboog
 - 12 – liniaal
 - 13 – engineerswinkelhaak
- (13)

VRAAG 5

5.1 Hoe die spoelings tussen die spoelings van 'n outomatiese spoelbak gereguleer word:

5.1.1 die drupkraan vinniger of stadiger te stel (1)

5.1.2 op die wyse word die tussenposes verleng of verkort (1)

5.2 Waar en vir watter doel u vuilwater tregters sal gebruik:

Waar: hospitale
 klinieke
 hostelle
 groot kontoorgeboue

Doel: Vir die leiding en reiniging van slopemmers. (5)

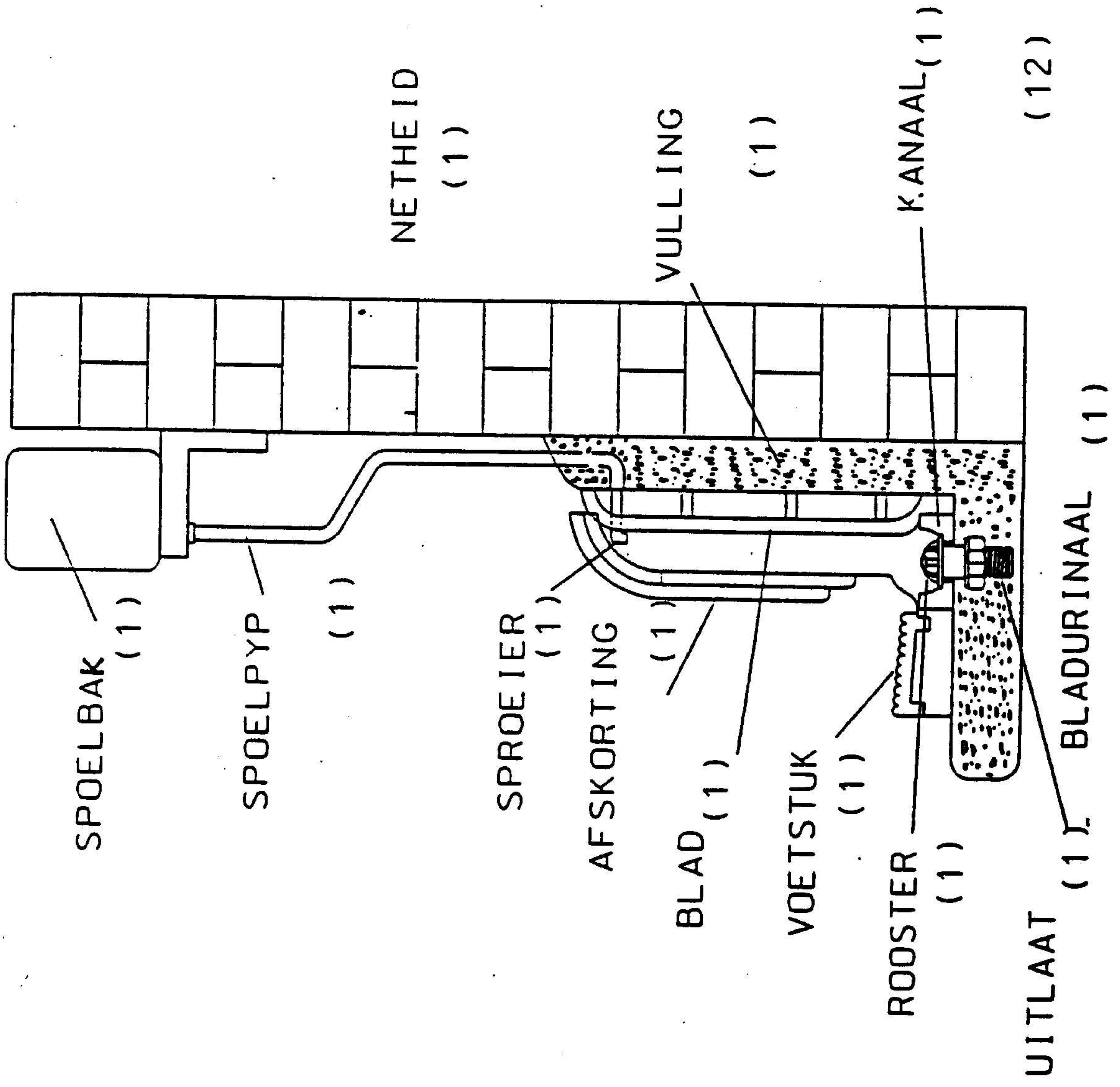
5.4 Ses stappe om cholera te bekamp:

5.4.1 drink slegs kraan, gekookte of behandelde water

5.4.2 stoor water in skoon verseelde houers

5.4.3 was alle rou voedsel soos vrugte en groente met skoon behandelde of gekookte

VRAAG 5.3



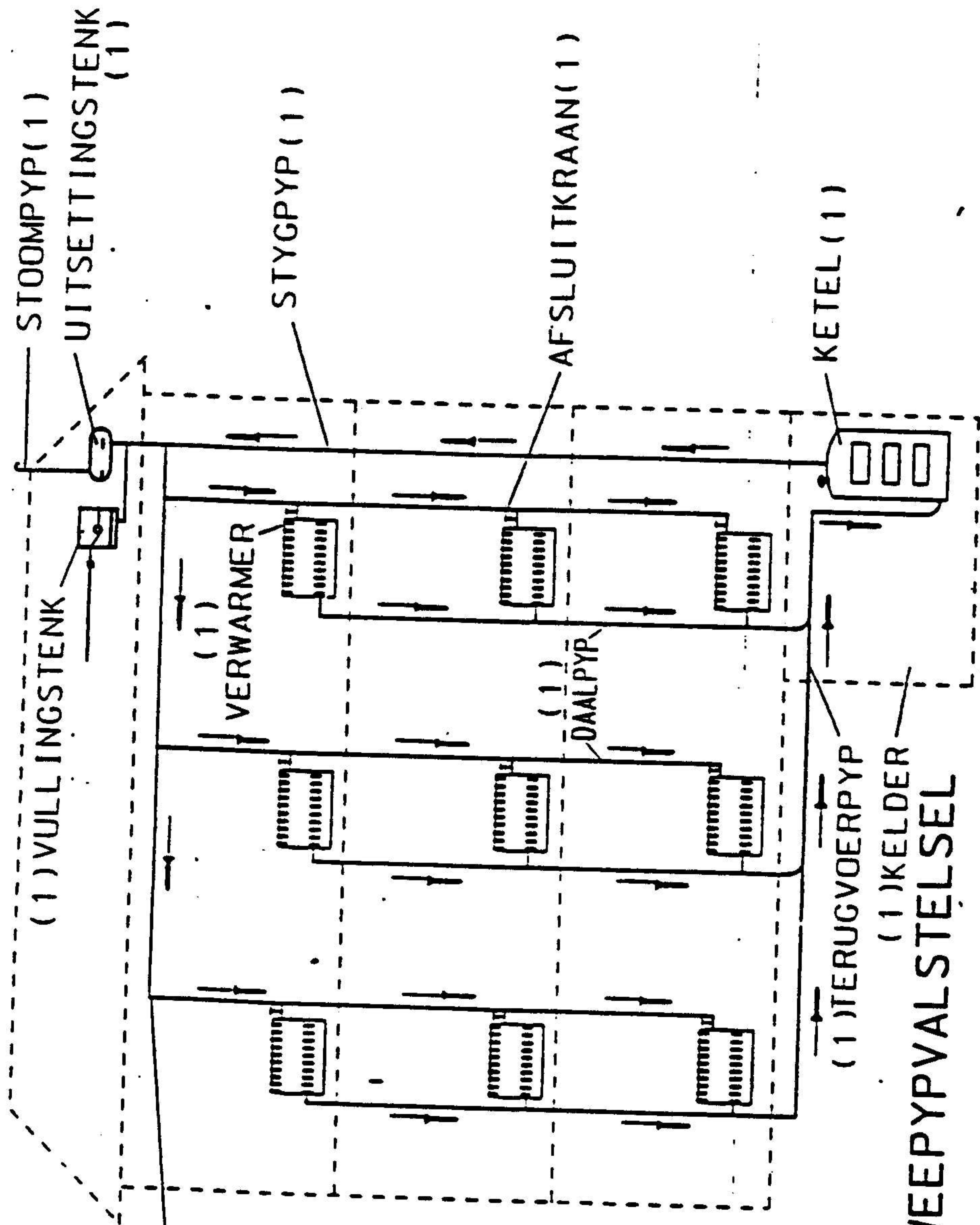
- water
- 5.4.4 was hande voordat daar met voedsel gewerk word
- 5.4.5 beskerm voedsel teen vliegbesmetting
- 5.4.6 gebruik goeie toilet fasiliteite en was jou hande nadat jy by die toilet was
- 5.4.7 moet nie riviere en damme besoedel nie, of menslike afval op plekke laat waar die reën dit in 'n rivier kan spoel nie
- 5.4.8 moet nie kinders toelaat om in vuil riviere, damme of poele te speel nie
- Enige ses (6)

VRAAG 6

SENTRALE VERWARMING

- 6.1 Die beginsel van verwarming en die toepassing daarvan in 'n sentrale verwarmingstelsel:
- (1)
- 6.1.1 Straling
- (i) die vuur straal hitte na die wande van die ketel uit
- (ii) verwarmers straal hitte uit na die onmiddellike omgewing (persone en voorwerpe)
- Enige een (2)
- 6.1.2 Geleiding
- (i) hitte van die vuur word deur die metaalwand na die water gelei
- (ii) hitte word vanaf metaal na die water gelei
- (iii) hitte van die warmwater word deur die metaal van die verwarmers na die lug, wat daarmee in aanraking kom, gelei
- Enige een (2)
- 6.1.3 Konveksie
- (i) water wat in die ketel verwarm word, vloei deur middel van konveksiestrome met die vloeiptye langs na die verwarmers
- (ii) die water wat afgekoel het vloei deur middel van konveksiestrome deur die terugvloeiptye na die ketel om meer verwarm te word
- (iii) die lug wat deur geleiding verwarm word, versprei deur middel van konveksiestrome en verwarm die hele vertrek
- Enige een (2)
- 6.2 Twee metodes om die pype in 'n sentrale verwarmingstelsel te rangskik
- (i) eenpypstelsel
- (ii) tweepypstelsel
- (1)
(1)

VRAAG 6.2



SEKONDERE TERUGVLOEI
(1)

Netheid	-	1
Verhouding	-	2
verwarmers met kleppe	-	3
toevoer- en uitsittenk met uitsittyp	-	4
ketel	-	1
vloeiyppe	-	1
terugvloeipype	-	1
pyltjies	-	1
		<u>14</u>

DIE TWEEPYPVALSTELSEL

NETHEID (1)

VRAAG 7

7.1 Ses belangrike stadiums in volgorde, in die behandeling van lug in 'n groot lug versorgingstelsel en 'n kort beskrywing van elke stadium

Suigwaaier (1)

'n Sterk kragaangedrewe sentrifugale waaier suig die vars lug in en stuur dit deur die stelsel wat dit deur die gebou versprei (1)

Bevogting (1)

Die lug word deur 'n mis- of waterskerm gestuur wat die voggehalte verhoog (1)

Primêre filters (1)

Die filters bestaan uit vervangbare linneskermes en verwyder stof en ander swe-wende deeltjies uit die lug (1)

Ontvogting (1)

Om die voggehalte te verlaag, word die lug deur metaalskermes gestuur. Oortolige waterdamp kondenseer daarop (1)

Hoë doeltreffendheidsfilters (1)

Bestaan uit 'n aantal vervangbare, geaktiveerde koolstof- of houtskool filters, wat baie fyn stofdeeltjies, rook en onwelriekende geure verwyder (1)

Verwarming of verkoeling (1)

Na gelang van weerstoestande word die lug verwarm of verkoel. Die temperatuur van die lug word outomaties beheer deur termostate. (1)

7.2 Die soort ventilasieselsel wat in elk van die volgende gevalle gebruik word:

7.2.1 Skooldklaskamer: natuurlike ventilasie

7.2.2 Kombuis van 'n koshuis: 'n uitlaatstelsel bestaande uit 'n paar suigwaaiers

7.2.3 'n Groot skouburg: saamgestelde lugversorgingstelsel Twee punte elk (6)

7.3 Drie hulpmiddels wat kan meehelp met die natuurlike ventilasie van 'n gebou:

7.3.1 deure

7.3.2 vensters

7.3.3 ventilators

7.3.4 lugstene

7.3.5 skoorstene

7.3.6 hortjies

Enige 3 – 2 punte elk (6)

7.4 Die vernaamste voordeel van natuurlike ventilasie bo meganiese ventilasie:

Dit is baie goedkoop

(1)

Fig 1

