# SENIOR CERTIFICATE EXAMINATION
## *SENIORSERTIFIKAAT-EKSAMEN*

## OCTOBER / NOVEMBER
## *OKTOBER / NOVEMBER*

# 2004

# PLUMBING AND SHEET METALWORK

## *LOODGIETERY EN PLAATMETAALWERK*

SG **710-2/0**

PLUMBING AND SHEET METALWORK SG

710 2 0 SG

**10 pages**
**10 *bladsye***


**APPROVED BY UMALUSI / *GOEDGEKEUR DEUR UMALUSI***

**GAUTENGSE DEPARTEMENT VAN ONDERWYS**

**SENIORSERTIFIKAAT-EKSAMEN**

**LOODGIETERY EN PLAATMETAALWERK SG**

**TYD: 3 uur**

**PUNTE: 200**

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**INSTRUKSIES:**

- Beantwoord AL die vrae.
- Beantwoord Vraag 2.1 op die diagramvel op bladsy 7 en Vraag 5.2.2 op die diagramvel op bladsy 10.
- Vraag 8 en al die ander tekeninge moet in die antwoordboek gedoen word.

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## VRAAG 1
## WATERSUIWERING

1.1 Noem VYF voordele van 'n meganiese drukfilter bo 'n sandfilter. (5)

1.2 Noem TWEE nadele van meganiese drukfilters. (2)

1.3 Noem en beskryf die doel van elke filtreerlaag in die drukfilter. (6)

1.4 Wat is die doel daarvan om gefiltreerde water te chloreer? (2)

1.5 Waarom word aluminiumsulfaat by water gevoeg? (2)

1.6 Teken 'n enkellynskets van die watertoevoerketting (opgaardam tot by die verbruiker). Die tekening moet in volgorde wees en die volgende stadiums aantoon: ondergrondse reservoir, filter, sedimentasie, koagulasie, chlorering, opgaardam en reservoir. (8)
**[25]**

**GAUTENG DEPARTMENT OF EDUCATION**

**SENIOR CERTIFICATE EXAMINATION**

**PLUMBING AND SHEET METALWORK SG**

**TIME: 3 hours**

**MARKS: 200**

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**INSTRUCTIONS:**

- Answer ALL the questions.
- Answer Question 2.1 on the diagram sheet on page 7 and Question 5.2.2 on the diagram sheet on page 10.
- Question 8 and all the other sketches have to be done in the answer book.

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## QUESTION 1
## WATER PURIFICATION

1.1 Name FIVE advantages of a mechanical pressure filter over a sand filter. (5)

1.2 Name TWO disadvantages of mechanical pressure filters. (2)

1.3 Name and describe the purpose of each filter layer in the pressure filter. (6)

1.4 What is the purpose of chlorinating filtered water? (2)

1.5 Why is aluminium sulphate added to water? (2)

1.6 Draw a single-line sketch of the water supply chain (storage dam to the consumer). The drawing must be in sequence and must include the following stages: underground reservoir, filter, sedimentation, coagulation, chlorination, storage dam and reservoir. (8)

**[25]**

## VRAAG 2
## RIOLERING

Beantwoord hierdie vraag op die diagramvel op bladsy 7.

2.1 Die diagram toon die gedeeltelike plan van 'n woonhuis en buitegeboue onder een dak. Die sanitêre muurmeublemente word deur nommers aangedui en die munisipale aansluitingspunt word ook op die plan getoon. Gebruik die diagramvel en ontwerp 'n geskikte en doeltreffende rioleringstelsel wat aan die regulasies voldoen.

Puntetoekenning is soos volg:

- Tekening (9)
- Een lugpyp van 100 mm (1)
- Vier rioolputte (4)
- Voldoende toegangsopeninge vir skoonmaakdoeleindes (3)
- Standaardafkortings vir VIER sanitêre toebehore (2)
- Standaardafkortings vir VIER rioleringsbesonderhede (2)

2.2 Watter invloed het Vigs op ons land se ekonomie en ontwikkeling? (4)
**[25]**

## VRAAG 3
## VEILIGHEIDSMAATREËLS

3.1 Noem TWEE veiligheidsmaatreëls wat jy sal tref, wanneer diep rioolslote gegrawe word. (4)

3.2 Noem VIER veiligheidsmaatreëls wat jy sal toepas by die gebruik van die oksiasetileensweisapparaat. (4)

3.3 Hoe sal jy die probleem oplos, indien die minimum vereiste gronddiepte by 'n rioolpyplyn nie bereik kan word nie? (2)

3.4 Wat sal die gevolg wees indien die helling van 'n rioolpyplyn groter is as die maksimum wat toegelaat word? (2)

3.5 Sou jy dit oorweeg om 'n stapelriool met 'n staalplaat te bedek? Gee redes vir jou antwoord. (5)

3.6 Hoe sou jy te werk gaan om die bloed van 'n elektriese boormasjien af te verwyder waar 'n persoon 'n ongeluk gehad het? (2)

3.7 Noem die veiligheidsmaatreëls wat jy sal toepas om die moontlike verspreiding van Vigs in die werksplek te voorkom. (6)
**[25]**

## QUESTION 2
## DRAINAGE

Answer this question on the diagram sheet on page 7.

2.1 The diagram shows the part plan of a dwelling and outbuildings under one roof. The sanitary fitments are indicated by means of numbers and the municipal connection is also shown on the plan. Using the diagram sheet, design a suitable and efficient drainage system that complies with the regulations.

Mark allocation as follows:

- Drawing (9)
- One 100 mm vent pipe (1)
- Four gullies (4)
- Adequate access openings for cleaning purposes (3)
- Standard abbreviations for FOUR of the sanitary fitments (2)
- Standard abbreviations for FOUR drainage details (2)

2.2 What is the effect of Aids on our country's economy and development? (4)

**[25]**

## QUESTION 3
## SAFETY MEASURES

3.1 Name TWO safety measures that you would apply during the excavation of drain trenches of considerable depth. (4)

3.2 Name FOUR safety measures that you would apply when using the oxyacetylene welding apparatus. (4)

3.3 How would you solve the problem if the minimum required depth of a sewerage pipeline cannot be obtained? (2)

3.4 What would be the result if the angle of a sewerage pipeline is more than the maximum that is allowed? (2)

3.5 Would you consider covering a French drain with a steel plate? Give reasons for your answer. (5)

3.6 How would you go about cleaning up the blood on an electric drilling machine, where someone had an accident? (2)

3.7 Name the safety measures you would prescribe to prevent the possible transmitting of Aids in the workplace. (6)

**[25]**

## VRAAG 4
## GEREEDSKAP, WERKTEGNIEKE EN-METODES

**Figuur A – L** op bladsy 8 en 9 toon 'n aantal bewerkings, tegnieke en metodes. Bestudeer die sketse noukeurig en beantwoord die volgende vrae.

4.1 Skryf die letters **A – L** onder mekaar neer en noem die bewerkingsmetodes of tegniek wat in elke geval toegepas word. (12)

4.2 Skryf die nommers **1 – 13** onder mekaar neer en noem die gereedskapstuk of toerusting wat deur die pylpunt aangedui word. (13)
**[25]**

## VRAAG 5
## SANITÊRE MUURMEUBLEMENTE

5.1 Noem TWEE gevalle waar jy die gebruik van bladurninale sal aanbeveel. (2)

5.2 **Figuur 5** op bladsy 10 toon 'n P-sperder en spoelbak in posisie wat by die hoofriool moet aansluit.

5.2.1 Stel 'n lys van materiaal op wat jy sal benodig om die taak te voltooi. (8)
5.2.2 Voltooi die tekening in **Figuur 5** op bladsy 10 deur gebruik te maak van die lys van materiaal wat jy opgestel het. (10)
5.2.3 Noem al die pype, pypgroottes, koppelings en monterings op die tekening. (5)
**[25]**

## VRAAG 6
## SENTRALE VERWARMING

6.1 Beskryf kortliks die funksies van elk van die volgende onderdele van 'n sentrale verwarmingstelsel:

A. Ketel
B. Uitsittenk
C. Luglaatklep
D. Versneller of aanjapomp
E. Terugplooppyp
F. Vloeipyp (12)

6.2 Identifiseer TWEE voordele en TWEE nadele van die tweepypstelsel in vergelyking met die eenpypstelsel. (8)

6.3 Gee 'n kort verduideliking van wat verstaan word met **sentrale verwarming**. (5)
**[25]**

## QUESTION 4
## TOOLS, WORKING TECHNIQUES AND METHODS

**Figures A – L** on pages 8 and 9 show a number of working techniques and methods used. Study the sketches carefully and answer the following questions.

4.1 Write the letters **A – L** one below the other and name the working technique or method used in each case. (12)

4.2 Write the numbers **1 – 13** one below the other and name the tools or equipment indicated by the arrow. (13)
**[25]**

## QUESTION 5
## SANITARY FITMENTS

5.1 Name TWO instances where you would recommend the use of slab urinals. (2)

5.2 **Figure 5** on page 10 shows a P-trap and flushing cistern in position which is to be connected to the main sewerage.

5.2.1 Draw up a list of materials that you will need to complete the job. (8)
5.2.2 Complete the drawing shown in **Figure 5** on page 10 by making use of the materials you have listed. (10)
5.2.3 Name all the pipes, pipe sizes, connections and mountings on the drawing. (5)
**[25]**

## QUESTION 6
## CENTRAL HEATING

6.1 Briefly discuss the functions of each of the following components of a central heating system:

A. Boiler
B. Expansion tank
C. Bleeding valve
D. Accelerator or booster pump
E. Return pipe
F. Flow pipe (12)

6.2 Identify TWO advantages and TWO disadvantages of the two-pipe system as compared to the one-pipe system. (8)

6.3 Briefly explain what is understood by **central heating**. (5)
**[25]**

## VRAAG 7
## VENTILASIE EN SENTRALE LUGVERSORGING

7.1 Noem, in volgorde, SES belangrike stadiums in die behandeling van die lug in 'n groot lugversorgingstelsel. Gee 'n kort beskrywing van elke stadium. (12)

7.2 Noem die soort ventilasiestelsel wat jy in elk van die volgende gevalle sou aanbeveel:

7.2.1 'n Skoolklaskamer
7.2.2 Die kombuis van 'n koshuis
7.2.3 'n Groot skouburg (6)

7.3 Noem DRIE hulpmiddels wat kan meehelp met die natuurlike ventilasie van 'n gebou. (6)

7.4 Wat is die belangrikste voordeel van natuurlike ventilasie bo meganiese ventilasie? (1)
**[25]**

## QUESTION 7
## VENTILATION AND CENTRAL AIR-CONDITIONING

7.1 Name, in sequence, SIX important stages in the treatment of the air in a large air-conditioning system. Give a brief description of each stage. (12)

7.2 Name the type of ventilation system you would recommend in each of the following instances:

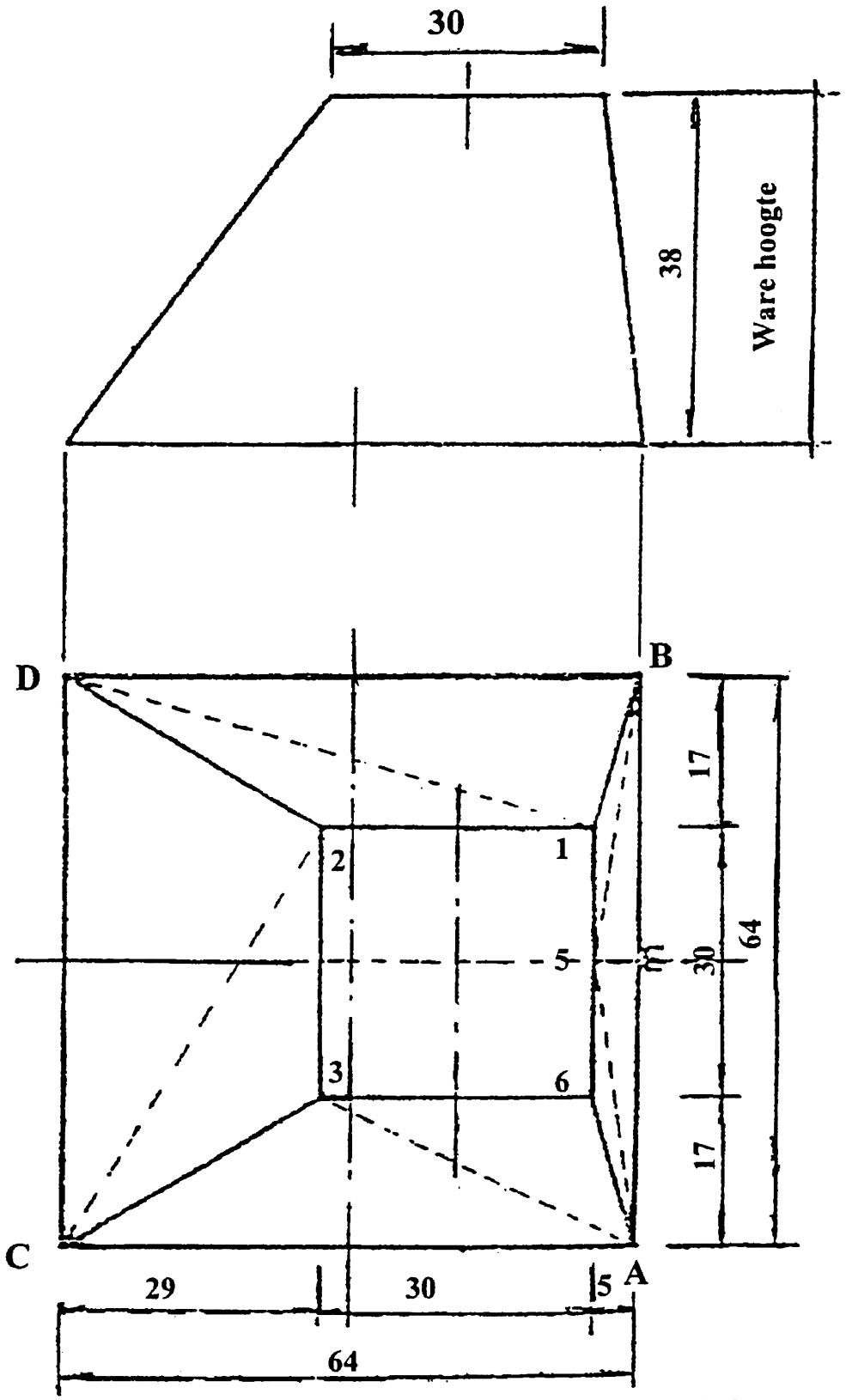
7.2.1 A school classroom
7.2.2 The kitchen of a hostel
7.2.3 A large theatre (6)

7.3 Name THREE aids which could assist the natural ventilation of a building. (6)

7.4 What is the main advantage of natural ventilation over mechanical ventilation? (1)
**[25]**

## VRAAG 8

**Figuur 8** toon twee aansigte van 'n vierkant-na-vierkant, afmiddelpuntige oorgangstuk. Teken die gegewe aansigte volgrootte en ontwikkel die patroon. **[25]**




**Figuur 8** **vierkant-na-vierkant**

**TOTAAL: 200**

**b.o.**

## QUESTION 8

**Figure 8** shows two views of a square-to-square off-centred transitional piece. Copy the given views full size and develop the pattern. **[25]**

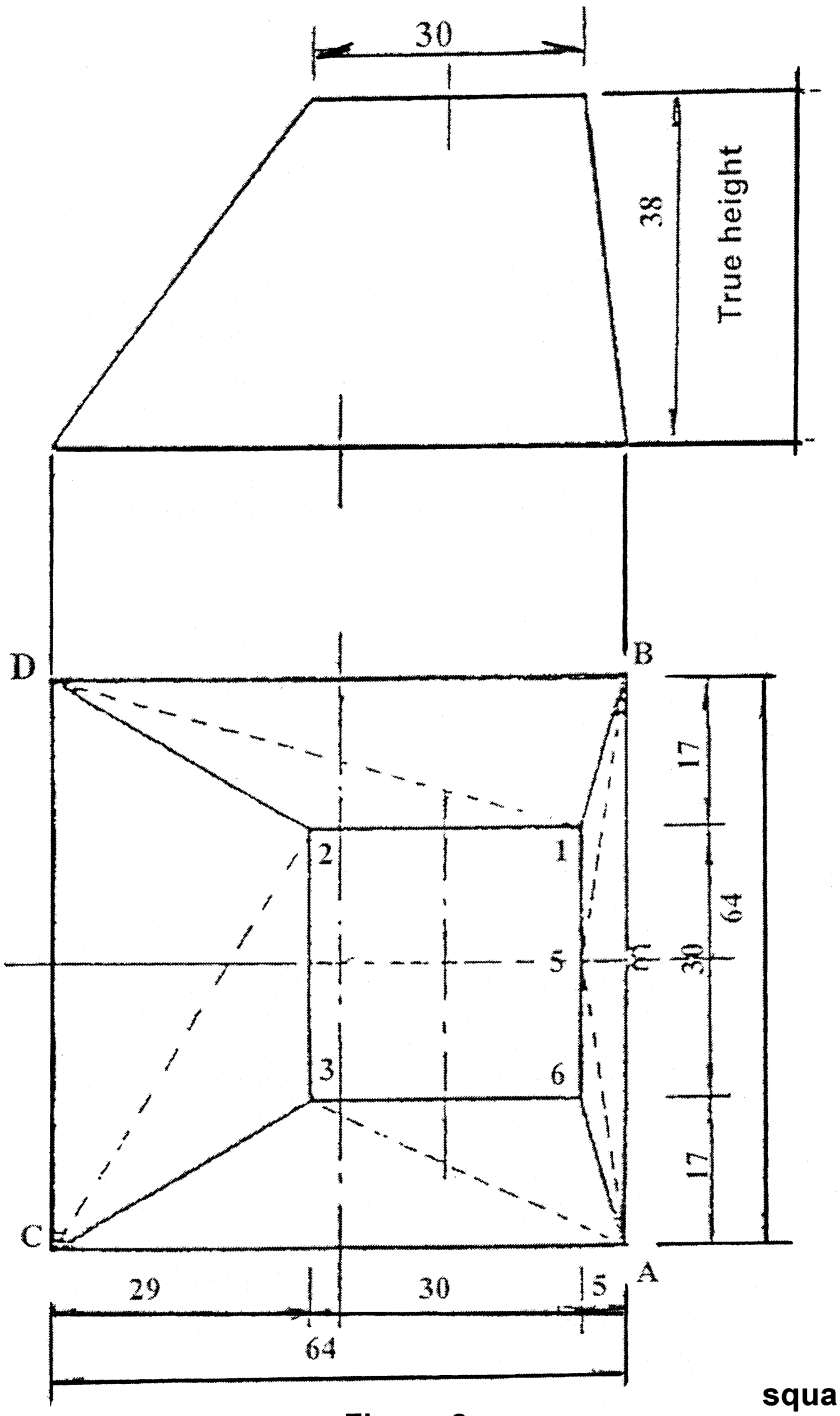



**Figure 8**

**square to square**

**TOTAL: 200**

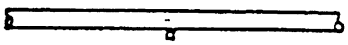
**DIAGRAM SHEET/ *DIAGRAMVEL***
**QUESTION/ *VRAAG* 2.1**

**CANDIDATE'S EXAMINATION NUMBER**
***KANDIDAAT SE EKSAMENNOMMER***

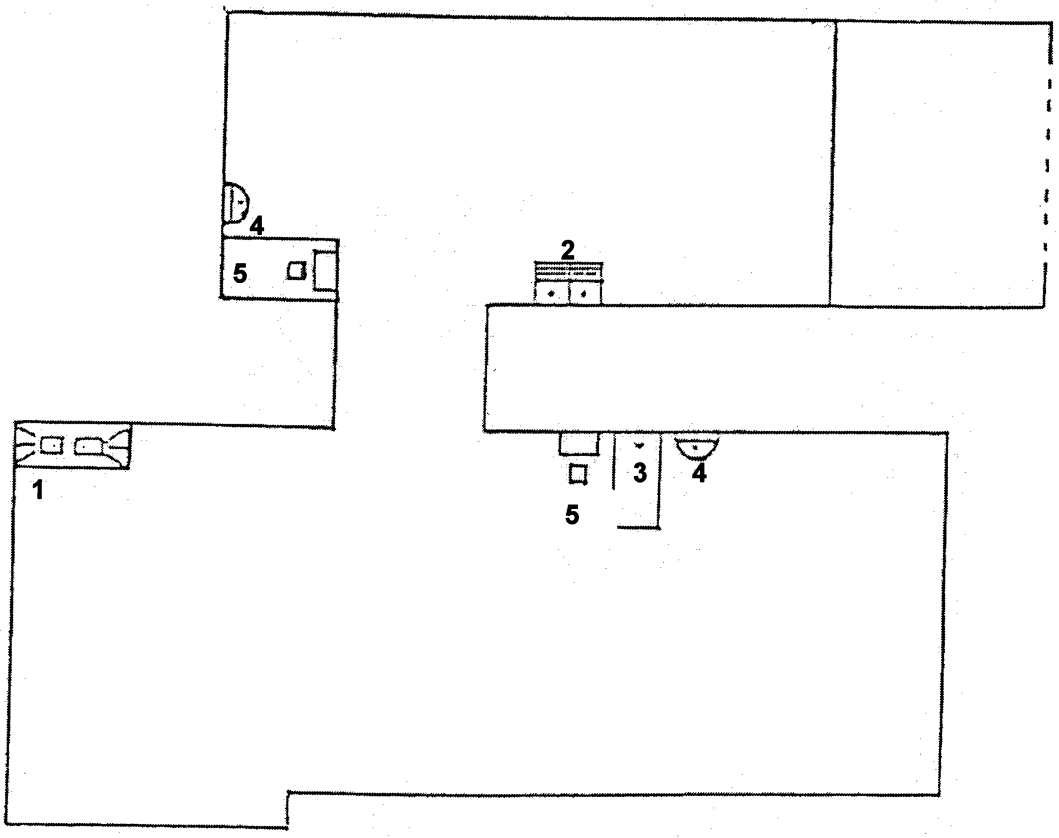
| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | |

| | | |
|---|---|---|
| Sink | 1 | *Opwasbak* |
| Wash Trough | 2 | *Wastrog* |
| Bath | 3 | *Bad* |
| Wash-hand Basin | 4 | *Handewasbak* |
| Water Closet | 5 | *Spoelkloset* |

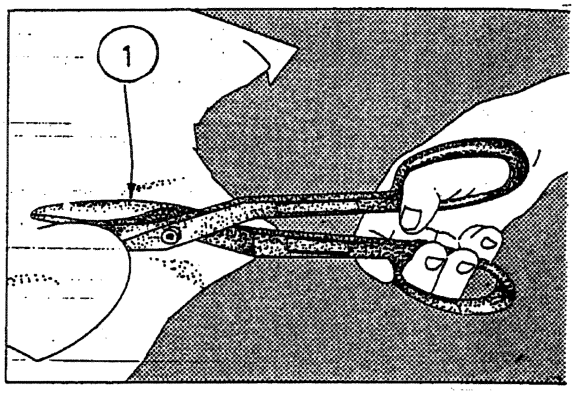
- Answer Question 2.1 on this diagram sheet.
  *Beantwoord Vraag 2.1 op hierdie diagramvel.*
- Once you have completed Question 2.1, please detach this page and place it in the **back** of your **answer book**.
  *Sodra jy Vraag 2.1 voltooi het, moet jy hierdie bladsy losmaak en **agter** in jou **antwoordboek** plaas.*



Main sewer connection/Hoofrioolaansluiting



A

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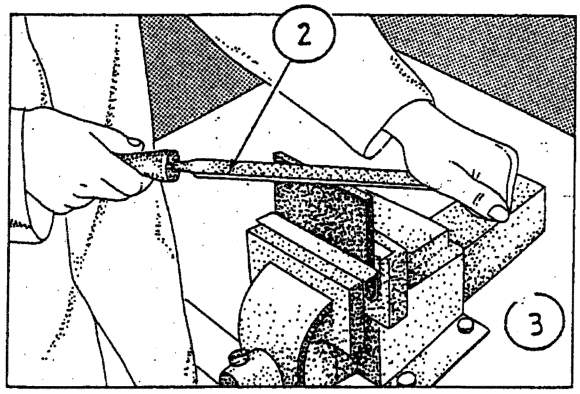


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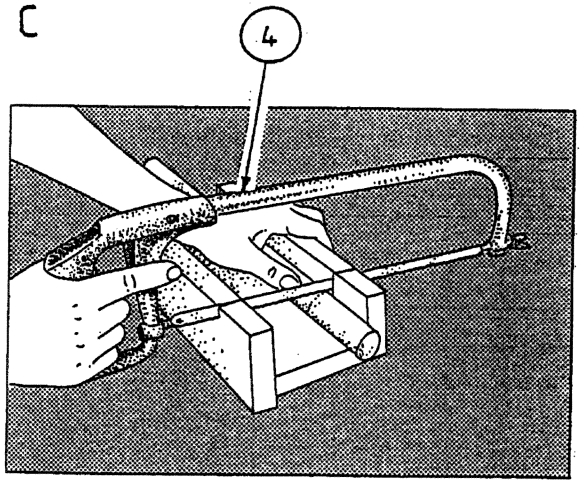


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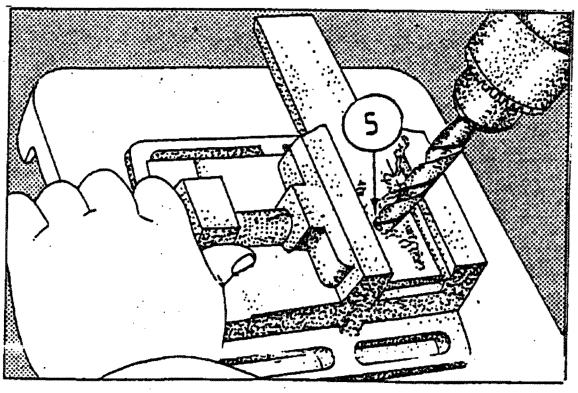


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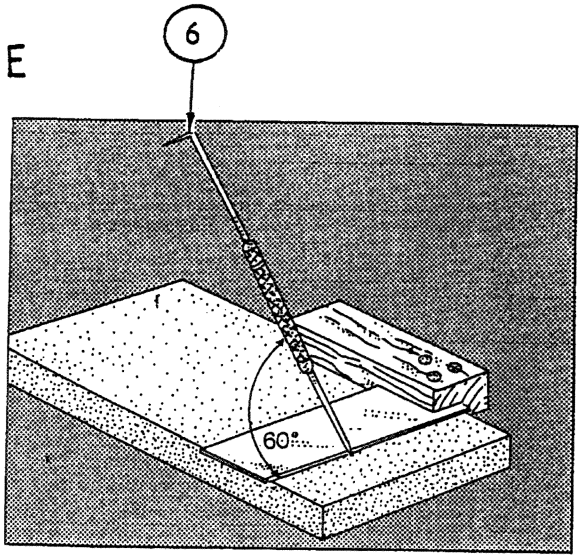


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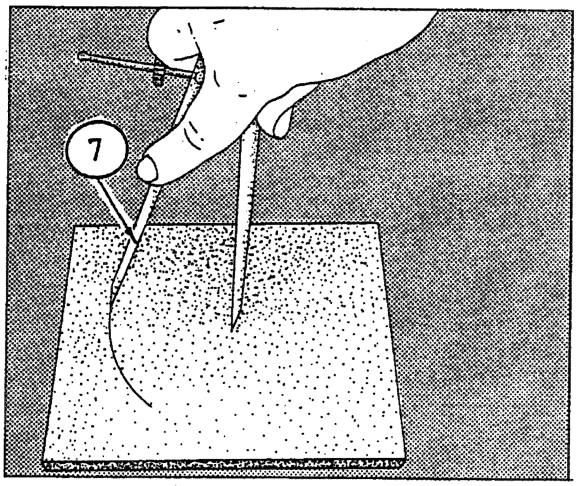

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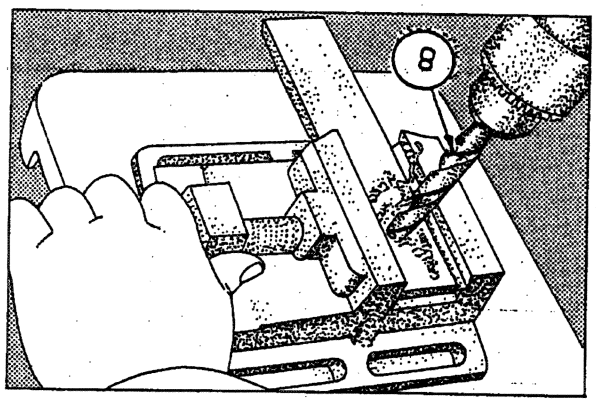


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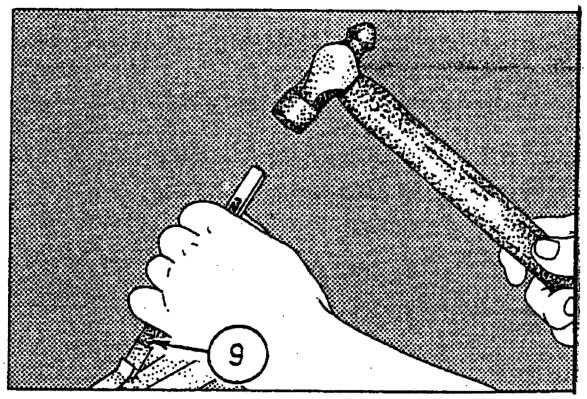


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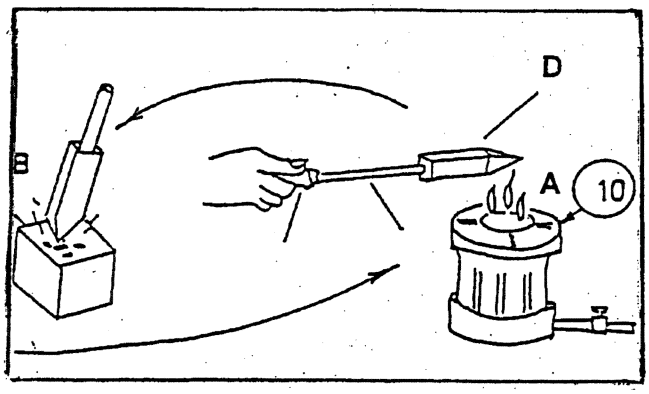


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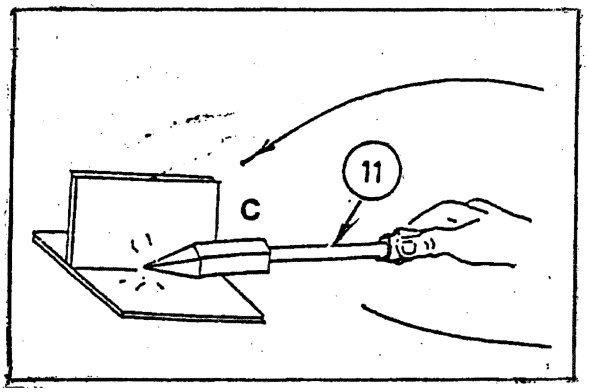


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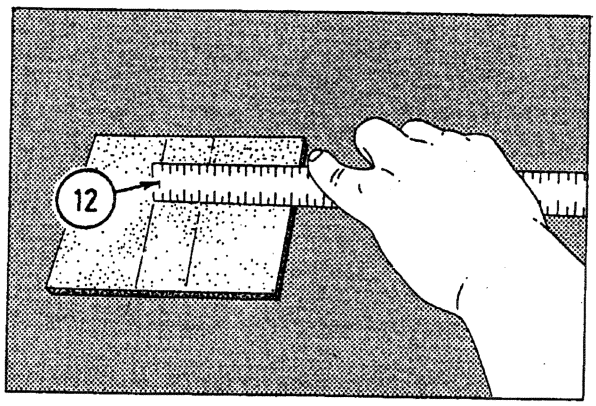


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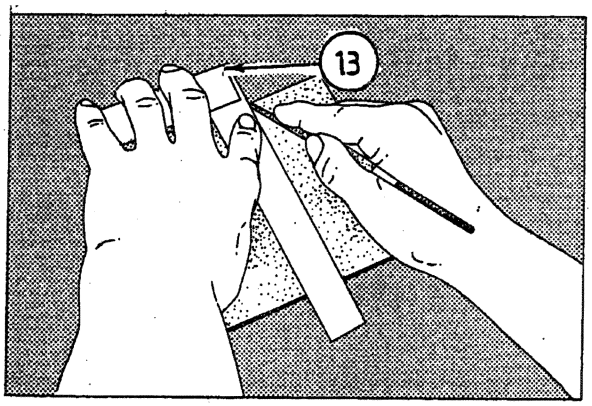
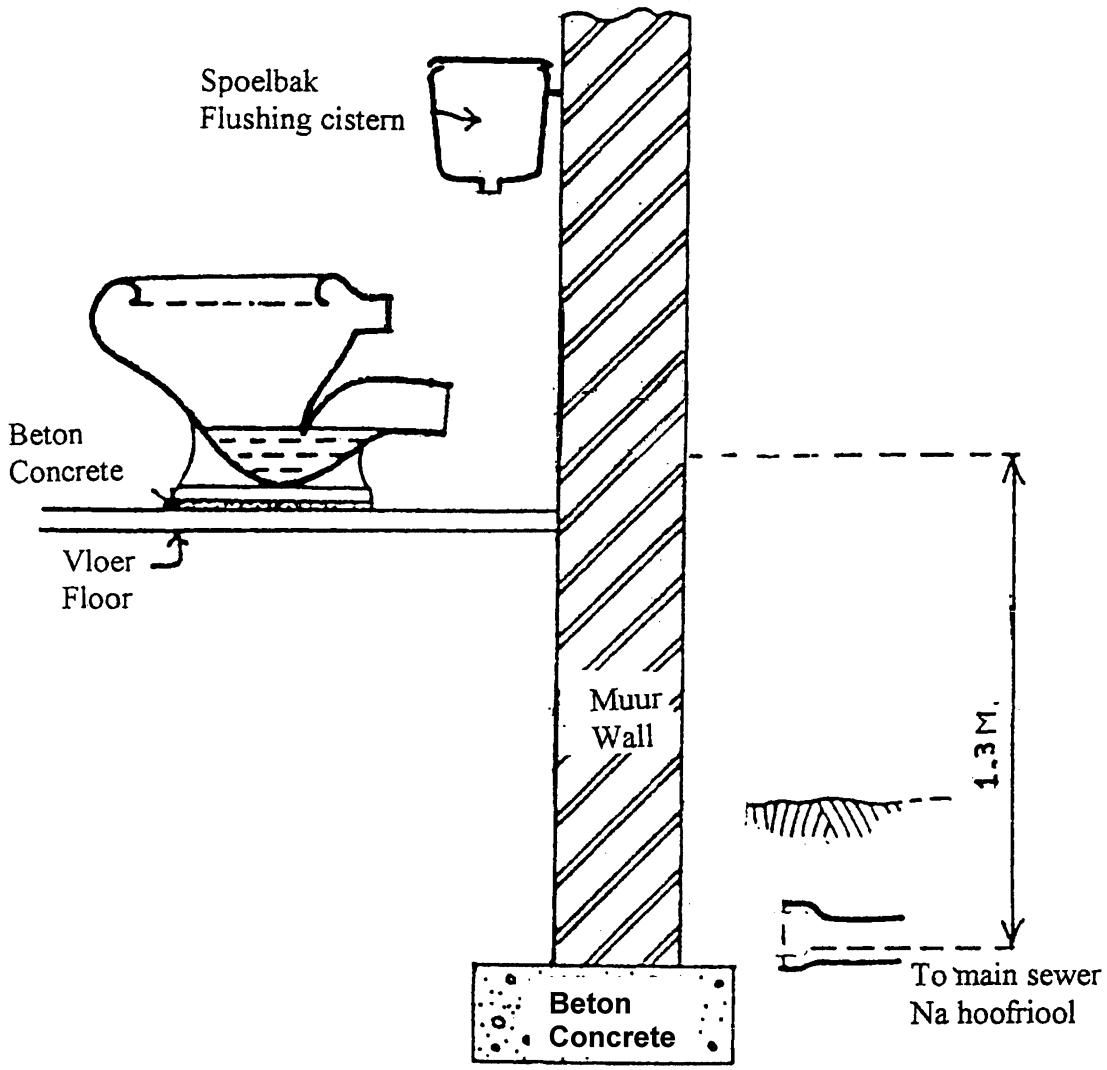


**DIAGRAMSHEET/ *DIAGRAMVEL***
**QUESTION/ *VRAAG 5***
**FIGURE/ *FIGUUR 5***

**CANDIDATE'S EXAMINATION NUMBER**
***KANDIDAAT SE EKSAMENNOMMER***

Place in the **back** of your **answer book** when completed.
*Sit **agter** in jou **antwoordboek** as jy klaar is.*




P-TYPE WATER CLOSET
P-TIPE WATER KLOSET

**END/ *EINDE***