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JUNE EXAMINATION GRADE 12

2026

NAME:	
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SCHOOL:	
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SUBJECT:	CIVIL TECHNOLOGY: CIVIL SERVICES
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ANSWER ALL THE QUESTIONS IN THE QUESTION PAPER.

MARKER					INT. MODERATOR				DIST. MODERATOR				PROV. MODERATOR			
Question	Marks			Marker's code & initials	Marks			IM's code & initials	Marks			DM's code & initials	Marks			PM's code & initials
1																
2																
3																
4																
5																
6																
TOTAL																

TIME: 3 hours

MARKS: 200

29 pages



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**INSTRUCTIONS AND INFORMATION**

1. This question paper consists of SIX questions. Answer ALL the questions in the spaces provided.
2. You may use sketches to illustrate your answers.
3. Use the mark allocation as a guide to the length of your answers.
4. Make drawings and sketches in pencil, fully dimensioned and neatly finished off with descriptive titles and notes to conform to the *SANS/SABS Code of Practice for Building Drawings*.
5. For the purpose of this question paper, the size of a brick should be taken as 220 mm x 110 mm x 75 mm.
6. Use your own discretion where dimensions and/or details have been omitted.
7. Answer QUESTIONS 2; 3.6; 5.1 and 5.2 on the templates provided, using drawing instruments where necessary.
8. Drawings in the question paper are NOT to scale due to electronic transfer.
9. No pages may be torn from this question paper.
10. Candidates may not retain a question paper or remove it from the examination room. Question papers must be returned to the invigilator at the end of the examination session.
11. Answers must be written in black/blue ink as distinctly as possible. Do NOT write in the margins.
12. Indicate the questions you have answered by drawing a circle around the relevant numbers on the front cover of the question paper where marks are to be recorded.
13. Draw a neat line through any work/rough work that must NOT be marked.
14. In the event that you use the additional space provided:
 - 14.1 Write down the number of the question.
 - 14.2 Leave a line open and rule off after your answer.
15. Write neatly and legibly.

REQUIREMENTS:

1. Drawing instruments
2. A non-programmable calculator

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QUESTION 1: OHSA, MATERIALS, TOOLS, EQUIPMENT AND JOINING (GENERIC)

1.1	Choose the correct word/phrase from those given in brackets. Write only the word/phrase below the questions (1.1.1 to 1.1.5) in the spaces provided.	
1.1.1	(Oil or water-based paint/Silicone/Acid) is used to protect metal against corrosion.	
		(1)
1.1.2	Curing (increases the strength of concrete/increases the density of concrete/ allows concrete to set faster).	
		(1)
1.1.3	Electroplating can be applied using (electrodes/electro jacks/ electrolysis).	
		(1)
1.1.4	Powder coating is the process of applying a layer of (plastic/paint/zinc) to metal.	
		(1)
1.1.5	Galvanising is the process of applying a (zinc/copper/tin) coating to the base of metals.	
		(1)



1.2 Answer the following questions regarding the scaffolding in FIGURE 1.2 below.

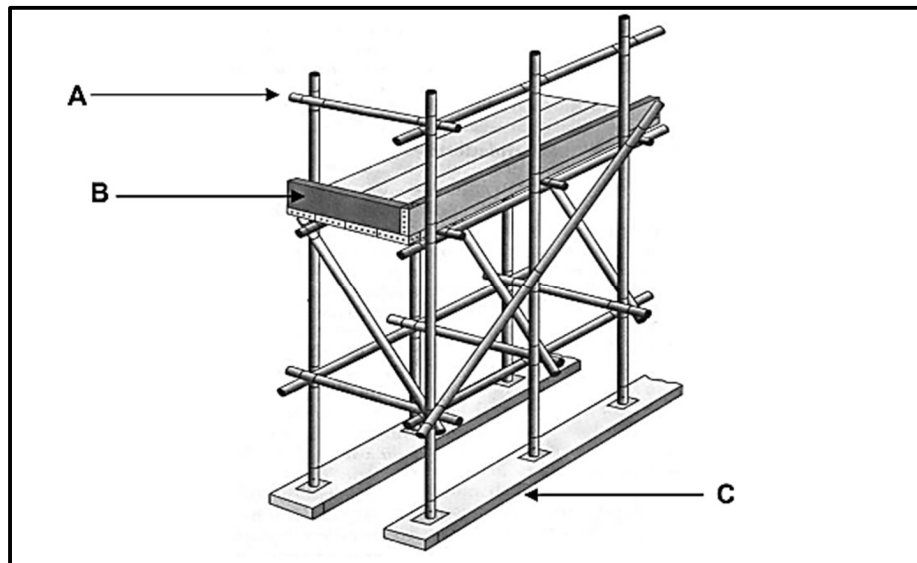


FIGURE 1.2

1.2.1	Name parts A to C .	
		(3)
1.2.2	Is this a dependent or an independent scaffolding?	
		(1)
1.2.3	What is the maximum height that part A must be from the platform?	
		(1)



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1.3	You have been tasked by a contractor to install a 20 kg gate to the pier of a boundary wall.	
1.3.1	Name the joining fixture that you will use to secure the gate to the pier.	
		(1)
1.3.2	Motivate why you will use this joining fixture.	
		(2)
1.3.3	Explain how you will install the gate by using the joining fixture mentioned in QUESTION 1.3.1, if the positions of the holes have already been marked on the pier.	
		(3)
1.4	You were tasked to locate steel bars and copper pipes placed in a wall.	
1.4.1	Name the tool you would use to detect these materials.	
		(1)
1.4.2	Describe how you will take care of this tool after you have used it.	
		(1)





1.5	Name TWO methods that can be used to move building material around a site.	
		(2)

[20]**QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)**

FIGURE **A** and FIGURE **B** on the next page shows drawings that appear on a building plan.

Analyse the drawings and complete the table that follows.



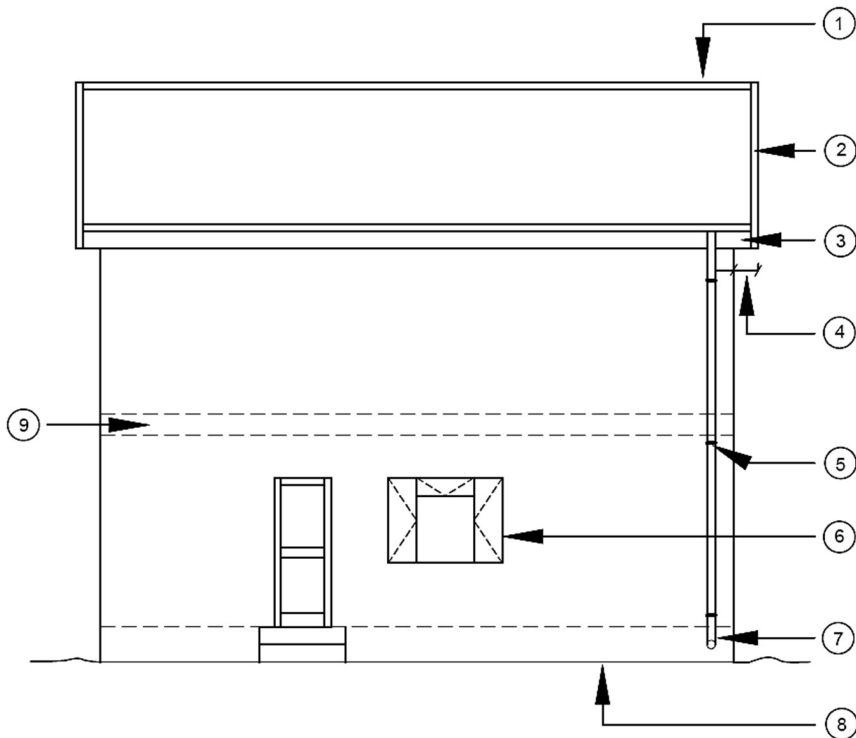


FIGURE A
SCALE 1 : 100

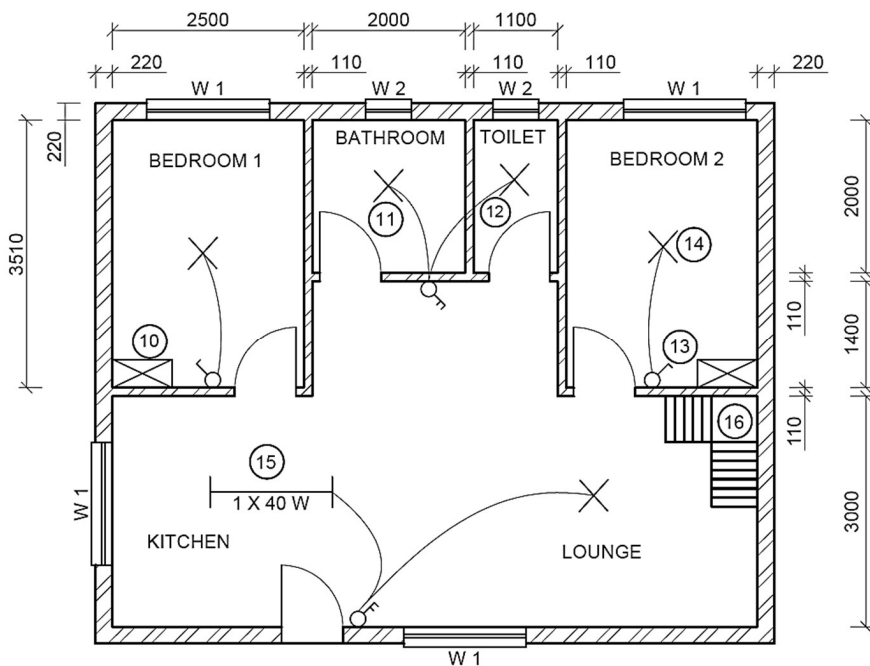


FIGURE B
SCALE 1 : 100

NOTES:

Contractors must verify all dimensions and levels on site before commencing work. Architects must be notified of any discrepancies immediately.

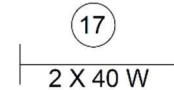
ARCHITECT'S SIGNATURE

CLIENT'S SIGNATURE

Brick force must be installed at every third course up to window height. From the top of the window, brick force must be installed between every course up to wall plate height.

DPM must be fitted under the floor slab to prevent water from the substructure.

The following electrical fittings must be installed in the kitchen:



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DRAWING TITLE:
SITE PLAN STAND 101

PROJECT:
PROPOSED DWELLING ON STAND 101,
JABULANI STREET, CRADOCK

PROJECT NO.
GR 448-210

DRAWING NO.
559P7

DATE:
27/03/2020

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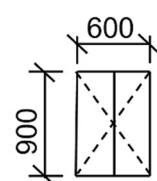
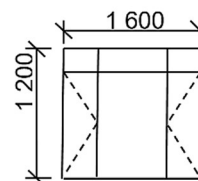
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WINDOW 1

WINDOW 2



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NO.	QUESTIONS	ANSWERS	MARKS
1.	Identify the elevation in FIGURE A.		1
2.	Describe the type of house that is indicated in FIGURE A.		1
3.	Identify number 1.		1
4.	Identify number 3.		1
5.	Identify number 4.		1
6.	Identify the fastener indicated by number 5.		1
7.	Identify number 6.		1
8.	Identify number 7.		1
9.	Identify number 8.		1
10.	What does <i>DPM</i> stand for, as indicated in the notes?		1
11.	Identify number 10.		1
12.	Recommend a suitable material that can be used for the manufacturing of number 2 in FIGURE A.		1
13.	Name the TWO elevations on which number 2 is installed.		2
14.	Describe the purpose of number 3.		1
15.	Deduce ONE feature that has been omitted from the elevation in FIGURE A.		1
16.	Recommend any TWO sanitary fitments carrying wastewater, other than a bath, that can be installed in the room indicated by number 11.		2





NO.	QUESTIONS	ANSWERS	MARKS
17.	What sanitary fixture carrying soil water can be installed in the room indicated by number 12 ?		1
18.	Describe the error that appears at number 6 in the elevation in FIGURE A .		1
19.	State the reference code for this plan.		1
20.	Which room will number 13 serve?		1
21.	What does the line between numbers 13 and 14 represent?		1
22.	Differentiate between number 15 in FIGURE B and number 17 in the notes.		2
23.	Explain the installation of brick force from the top of the window to the wall plate, as indicated by the architect.		1
24.	Recommend a possible finish for the outside walls of the house.		1
25.	Deduce from FIGURE A which elevation does not have windows.		1
26.	Deduce the thickness of the external wall in FIGURE B .		1
27.	Name the material that can be used to close the open sides of number 16 .		1
28.	Name the town in which the proposed dwelling will be built.		1





NO.	QUESTIONS	ANSWERS	MARKS
29.	Calculate the area of the bathroom. Show ALL calculations. Give your answer in m ² .		3
30.	Calculate the total length of the wall on the EASTERN side of the building. Show ALL calculations. The length must be indicated in metres.		6

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QUESTION 3: CONSTRUCTION ASSOCIATED WITH CIVIL SERVICES, OHSA AND QUANTITIES (SPECIFIC)

3.1 FIGURE 3.1 below shows workers who work in a manhole. Answer the following questions regarding the safety measures that must be applied.



FIGURE 3.1

3.1.1	What is the purpose of structure A ?	
		(1)
3.1.2	What is the purpose of equipment B ?	
		(1)
3.1.3	Briefly describe in which circumstances equipment B will be used.	
		(2)
3.1.4	Which item of personal protective equipment is missing for the manhole worker if hazardous fumes are present in the manhole?	
		(1)



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3.2	Identify TWO methods used to backfill trenches.	
		(2)

3.3 FIGURE 3.3 below is a drawing of a type of shore used in trenches. Study the drawing and answer the questions that follow.

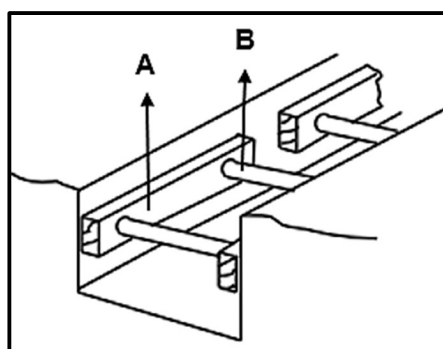
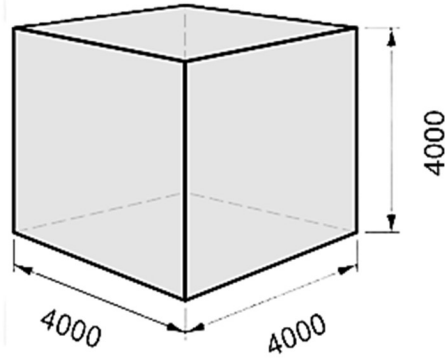


FIGURE 3.3

3.3.1	Name the type of soil in which this type of shoring would be used.	
		(1)
3.3.2	Identify A and B .	
	A:	
	B:	(2)

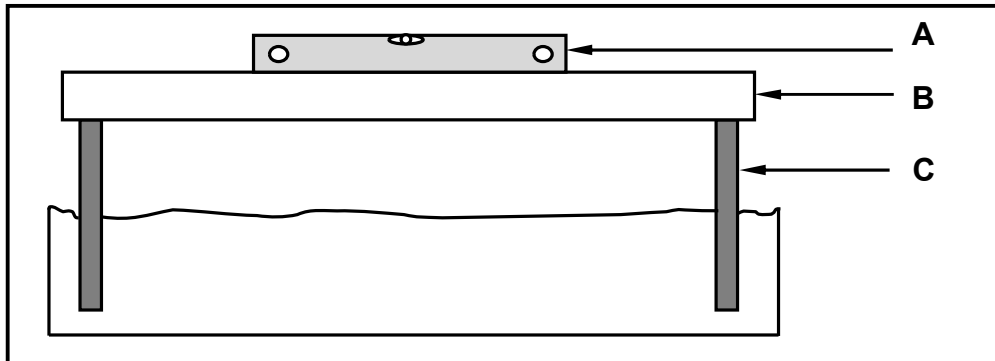
3.4	FIGURE 3.4 below shows the internal measurements of the sides of a cubic tank as 4 000 mm. In the following calculations, show ALL formulae. Round-off your answers to TWO decimal places.	
	 FIGURE 3.4	

3.4.1	Calculate the volume of the tank in m ³ .	
		(5)

3.4.2	Calculate the volume of the tank in litres.	
		(2)

3.5

FIGURE 3.5 below shows the layout used to determine the route and fall of a trench. Study the drawing and identify **A**, **B** and **C**.

**FIGURE 3.5**

A:

B:

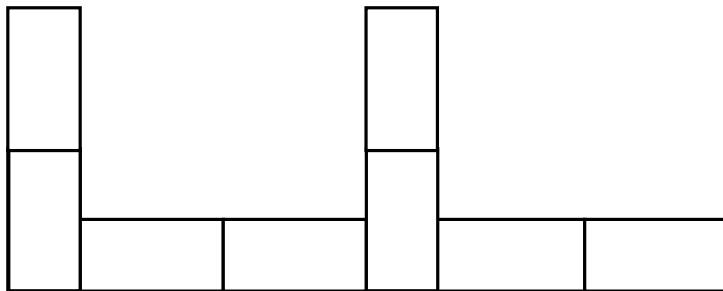
C:

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3.6	The top view of a corner (quoin) of a wall with a T-junction (1 st course) is given. Use the space provided to project and draw the consecutive layers of this brick wall (2 nd course).	(10)
-----	--	------

1st course2nd course

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Correctness of 2 nd course drawing	10	

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**QUESTION 4: COLD-WATER SUPPLY AND CONSTRUCTION (SPECIFIC)**

4.1	Differentiate between a <i>hand compaction</i> and a <i>machine compaction</i> .	
		(2)

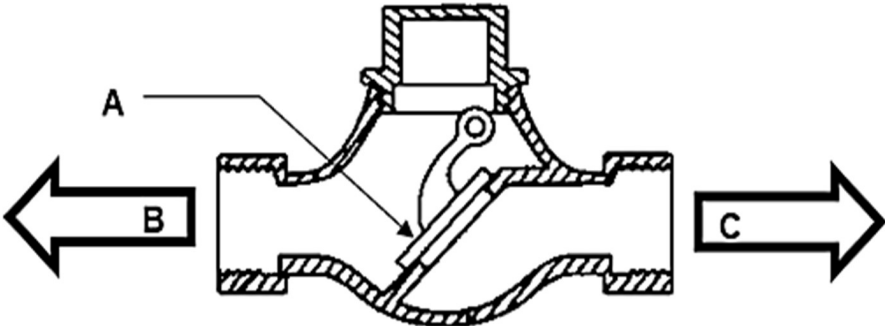
4.2	Recommend TWO regulations that are set out in the South African National Standards (SANS) part G – Excavations.	
		(2)

4.3	Name FOUR accessories that form part of a concrete ring manhole.	
		(4)

4.4	Name FIVE locations where manholes must be placed.	
		(5)



4.5	State the gradient for each of the following pipe diameters: A: 100 mm B: 150 mm C: 225 mm	
	A:	(3)
	B:	
	C:	

4.6	FIGURE 4.6 below is a drawing of a device used in a cold-water system. Study the drawing and answer the questions that follow.	
	 FIGURE 4.6	

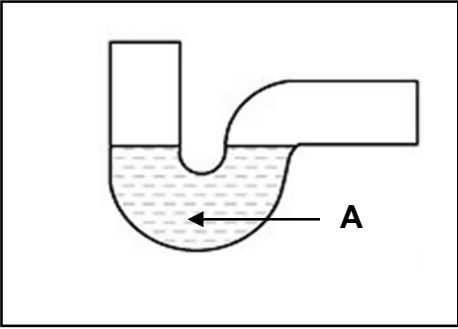
4.6.1	Identify the type of valve shown above?	
		(1)
4.6.2	Identify part A .	
		(1)
4.6.3	Which arrow point, B or C , indicates the correct flow direction?	
		(1)
4.6.4	In which circumstances is this type of valve used?	
		(1)





4.7	Identify FOUR water-saving devices.	
		(4)
4.8	When a water supply pipe bursts, muddy water may enter the pipe. Briefly motivate why the muddy water must first be pumped out, before the pipe is repaired.	
		(2)
4.9	In which circumstances is the long screw fitting used to repair galvanised pipes?	
		(1)
4.10	Describe the term <i>grey</i> or <i>wastewater</i> .	
		(2)
4.11	Differentiate between a <i>pillar tap</i> and a <i>bibcock</i> regarding their working principles and location.	
		(4)



4.12	FIGURE 4.12 below shows a drawing of a trap. Study the drawing and answer the questions that follow.	
	 FIGURE 4.12	

4.12.1	Identify the trap above.	
		(1)

4.12.2	Name TWO other types of traps that can be used in cold-water systems.	
		(2)

4.12.3	Identify TWO functions of the water seal at A .	
		(2)

4.12.4	What happens if the water seal at A is broken?	
		(1)

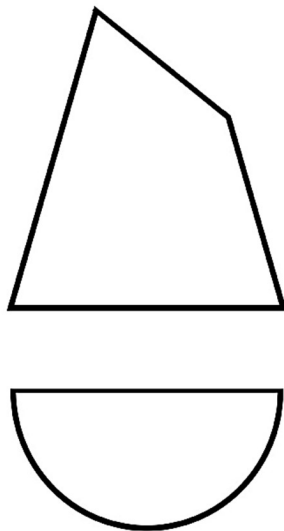
4.13	What is the main purpose of an inspection eye on a fitting?	
		(1)



**QUESTION 5: GRAPHICS AS MEANS OF COMMUNICATION AND QUANTITIES
(SPECIFIC)**

- 5.1 The front view of a frustum of a right cone where the top is not parallel to the base, is shown below.
- Use the drawing and the information given below and draw ONE development of a frustum. Remember the 3 mm seam on both sides.
- Show ALL construction lines. Do NOT redraw the given views. Project the development from the given views.

(18)

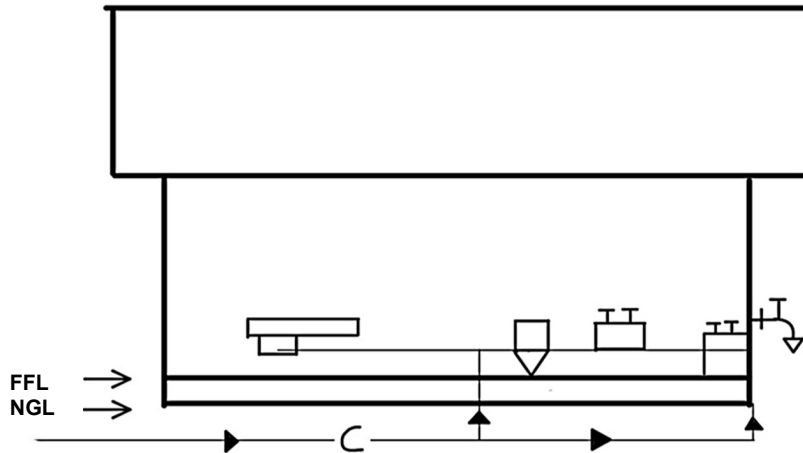


ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Correctness of development	18	

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- 5.2 FIGURE 5.2 shows a pictorial line diagram of the cold- and hot-water supply for a building. The geyser inlet and outlet pipes are 22 mm, and the hot-water branch pipes are 15 mm. Complete the missing information in the table below which assists in completing the installation.

**FIGURE 5.2**

ITEM	NAME OF SANITARY WARE OR FITTING	MATERIAL	SIZE	QUANTITY
1.	5.2.1 _____	Stainless steel or plastic		5.2.2 _____
2.	Water closet	5.2.3 _____		1
3.	5.2.4 _____	Ceramic		1
4.	Bath	5.2.5 _____		5.2.6 _____
5.	External tap	5.2.7 _____		5.2.8 _____
6.	Cold-water pipe	5.2.9 _____	22 mm	1
7.	Cold-water pipe	5.2.10 _____	15 mm	1
8.	Reducing elbow 90°	Copper	5.2.11 _____	1
9.	Elbow 90°	Copper	15 mm	2
10.	5.2.12 _____	Copper	22 mm x 22 mm x 15 mm	1

(12)

**QUESTION 6: JOINING, MATERIALS AND TOOLS AND EQUIPMENT (SPECIFIC)**

6.1	Indicate if the following statements are TRUE or FALSE. Write only 'true' or 'false' below the statements (6.1.1 to 6.1.4).	
6.1.1	Dezincification is a form of corrosion.	(1)
6.1.2	Copper-zinc alloys containing more than 5% zinc, are susceptible to dezincification.	(1)
6.1.3	Dezincification is an electrochemical reaction between zinc and water.	(1)
6.1.4	Dezincification can cause leaks in pipe work.	(1)
6.2	Fully explain what is meant by the electrolytic cleaning of a metal surface.	
		(4)





6.3	Briefly motivate why joints between copper and galvanised pipes must be avoided.	
		(2)

6.4	Zinc is a highly reactive metal. Explain why this property is a disadvantage in a zinc alloy.	
		(2)

6.5	Name FOUR factors that determine the thermodynamic and kinetic conditions of galvanic corrosion in metals.	
		(4)

6.6	Name TWO tools which are used for cleaning blockages in drains.	
		(2)



6.7	Why must loose clothing be avoided when working with the pipe-thread cutting machine?	
		(1)

6.8	FIGURE 6.8 below shows equipment used in a workshop. Study the drawing and answer the questions that follow.	
	 FIGURE 6.8	

6.8.1	Identify the tool shown above.	
		(1)

6.8.2	Name TWO systems where this tool is used.	
		(2)





6.8.3	Name TWO ways to care for this tool.	
		(2)

6.8.4	Explain what could cause this tool to show low pressure.	
		(2)

6.9	Name TWO tools that you can use to cut galvanized pipes.	
		(2)

6.10	Recommend TWO ways to secure unplasticised polyvinyl chloride pipes.	
		(2)



6.11	FIGURE 6.11 below shows a tool that is used on a building site and in workshops. Study the picture and answer the questions that follow.	
		
	FIGURE 6.11	

6.11.1	Identify the tool illustrated in FIGURE 6.11.	
		(1)

6.11.2	What is the use of this tool?	
		(1)

6.11.3	Identify FOUR types of solder.	
		(4)





6.11.4	What is the generic term for 'chemical anchors'?	
		(1)
6.11.5	Draw a neat free hand sketch of an overlap joint.	
		(3)

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