basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

CIVIL TECHNOLOGY: CIVIL SERVICES

MAY/JUNE 2026

MARKS: 200

TIME: 3 hours

This question paper consists of 17 pages and 4 answer sheets.

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REQUIREMENTS

1. Drawing instruments
2. A non-programmable calculator
3. ANSWER BOOK

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX questions.
2. Answer ALL the questions.
3. Read ALL the questions carefully.
4. Answer each question as a whole. Do NOT separate subsections of questions.
5. Number the answers correctly according to the numbering system used in this question paper.
6. Start the answer to EACH question on a NEW page.
7. Do NOT write in the margins of the ANSWER BOOK.
8. You may use sketches to illustrate your answers.
9. Write ALL calculations and answers in the ANSWER BOOK or on the attached ANSWER SHEETS.
10. Use the mark allocation as a guide to the length of your answers.
11. 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.*
12. For the purpose of this question paper, the size of a brick should be taken as 220 mm x 110 mm x 75 mm.
13. Use your own discretion where dimensions and/or details have been omitted.
14. Answer QUESTIONS 2, 3.6, 5.5 and 6.5 on the attached ANSWER SHEETS using drawing instruments, where necessary.
15. Write your CENTRE NUMBER and EXAMINATION NUMBER on every ANSWER SHEET and hand them in with your ANSWER BOOK, whether you have used them or not.
16. Drawings in the question paper are NOT to scale due to electronic transfer.
17. Google Images was used as the source of all photographs and pictures.
18. Write neatly and legibly.

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

Start this question on a NEW page.

1.1 Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question numbers (1.1.1 to 1.1.10) in the ANSWER BOOK, e.g. 1.1.11 Concrete.

1.1.1 Maintenance work on a building hoist should be carried out at least (once a year/twice a year). (1)

1.1.2 A trestle scaffold should not be used if it exceeds a height of (3 m/2 m). (1)

1.1.3 (Guard rails/Toe boards) must be installed at least 900 mm above the scaffold platform. (1)

1.1.4 A scaffold should be inspected (during bad weather/after bad weather) for it to be used. (1)

1.1.5 The working platform for suspended scaffolds should not exceed (1,6 m/1,8 m) in width. (1)

1.1.6 When working on elevated areas, waste material must be disposed of by (throwing it from a window/using a conveyor belt). (1)

1.1.7 Scaffold frameworks should be inspected at least (once a month/ once a week). (1)

1.1.8 A ladder must be fitted with (non-skid devices/hooks) at the bottom ends of the stiles. (1)

1.1.9 Doors and gates opening directly onto a stairway must have a platform that extends at least (510 mm/375 mm). (1)

1.1.10 The (head/crank) is NOT a part of a bolt. (1)

1.2 Which view below represents the top view of a hex flange?



A **B** **C** **D** (1)

1.3 Rawl bolts are purchased according to specifications. Name any TWO of these specifications. (2)

1.4 As a contractor, you are busy with the final finishes to a bathroom. You have to paint the ceiling.

1.4.1 Name TWO categories of paint. (2)

1.4.2 Explain TWO reasons for painting the ceiling. (2)

1.5 Predict the consequence if the laser level is NOT correctly set up on its tripod. (1)

1.6 Describe what must be done after a laser level was accidently dropped to ensure its accuracy. (1)

1.7 Describe how you will take care of the telescope after using the dumpy level. (1)
[20]

QUESTION 2: GRAPHICS AS MEANS OF COMMUNICATION (GENERIC)

Start this question on a NEW page.

FIGURE A and FIGURE B on the next page show drawings that appear on a building plan. Analyse the drawings and complete the table on ANSWER SHEET 2.

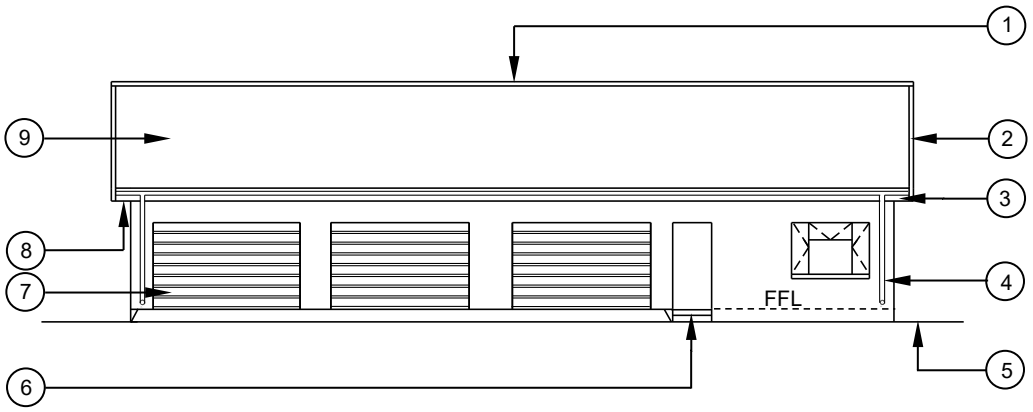


FIGURE A

NOTES:
Contractors must verify all dimensions and levels on site before commencing work.

Architects to be notified of any discrepancies immediately.

Aluminium gutters and downpipes must be fitted to the dwelling.

Roof: Gable roof

Fibre cement window sills must be installed below every window.

Architect's signature ……

Client's signature ……..

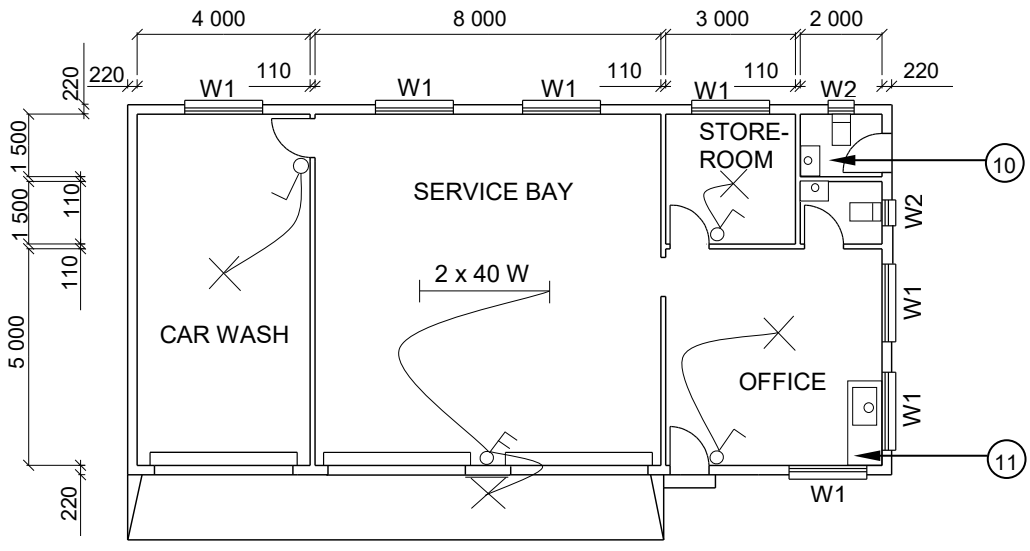
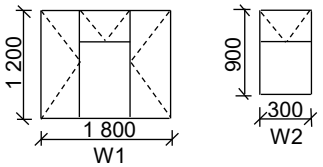


FIGURE B

REVISION 1	DATE: 14/04/2026	DRAWING OF ELECTRICAL WALL PLUGS
PRINTED BY: AFRIQ PRINTERS	DATE OF PRINT: 20/04/2026	
DRAWING TITLE: ELEVATION AND FLOOR PLAN		
PROJECT: PROPOSED DWELLING OF MS DALI ON PLOT 27, MALVA STREET, UMLASI		
PROJECT NO.: GR 288-444	DRAWING NO.: 886P2	
DATE: 12/04/2026	DRAWN: DP FOX	CHECKED: G PHIRI
ELEVATION	SCALE 1 : 100	
FLOOR PLAN	SCALE 1 : 100	
REFERENCE CODE: QP 6 – 2026		

WINDOW SCHEDULE



[40]

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

Start this question on a NEW page.

3.1 Why is it important to safeguard openings on construction sites? (2)

3.2 Describe ONE method that can be used to safeguard open floors on higher levels while construction takes place. (1)

3.3 FIGURE 3.3 below shows shoring used in trenches on a construction site.



FIGURE 3.3

3.3.1 The construction site is situated at the foot of a mountain slope. State what should be determined on the site before excavations can begin, after all administrative issues have been addressed. (2)

3.3.2 Identify TWO parts that can be used in the construction of the shoring above. (2)

3.3.3 Determine from FIGURE 3.3 the type of ground that this shoring could be used for. (1)

3.4 Draw, in your ANSWER BOOK, a neat sketch of a vertical sectional view of a concrete ring manhole with reducing slabs. Indicate the symbol for concrete on your drawing. (8)

3.5 FIGURE 3.5 below shows a drawing of a cylindrical geyser.

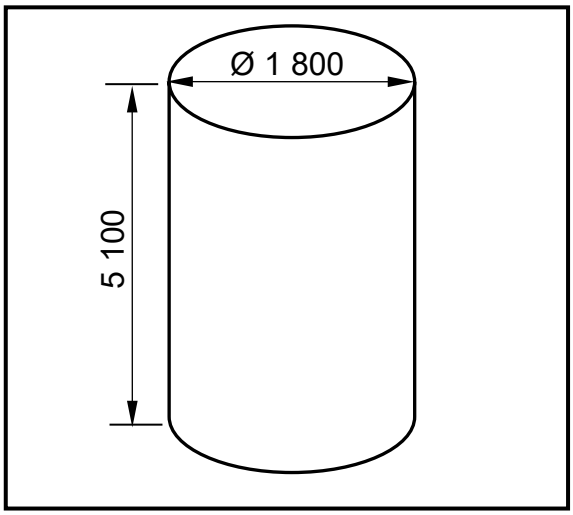


FIGURE 3.5

Calculate the volume of the tank in m^3. Show ALL calculations and round off your answer to TWO decimal places. (6)

3.6 ANSWER SHEET 3.6 shows the first plan course of a half-brick wall with a double return angle built in stretcher bond. Use the information given in the first plan course to project and draw the second course of the half-brick wall. (8)
[30]

QUESTION 4: COLD- AND HOT-WATER SUPPLY, TOOLS, EQUIPMENT AND MATERIALS (SPECIFIC)

Start this question on a NEW page.

4.1 Choose a description from COLUMN B that matches the item in COLUMN A. Write only the letter (A–L) next to the question numbers (4.1.1 to 4.1.8) in the ANSWER BOOK, e.g. 4.1.9 M.

COLUMN A		COLUMN B	
4.1.1	Airlock	A	used for increasing pressure in cold-water pipes
4.1.2	Water hammer	B	allows excess water to drain away
4.1.3	Overflow pipe	C	is caused by trapped air preventing water flow
4.1.4	Pressure-control valve	D	extracts heat from the air and heats the refrigerant which is used to heat water
4.1.5	High-pressure geyser	E	designed to prevent siphoning of water out of a cylinder
4.1.6	Solar geyser	F	a sudden pressure surge in pipes due to fast valve closure
4.1.7	Safety valve	G	a valve that releases water when the water temperature becomes too high
4.1.8	Heat pump	H	a device used to shut off the main water supply
		I	a water-heating system that uses sun energy
		J	regulates water pressure entering a household system
		K	a water-heating system designed to operate under high pressure
		L	a curved pipe that prevents sewer gases from entering a building

(8 x 1) (8)

4.2 Name TWO advantages of a high-pressure geyser. (2)

4.3 Draw the following symbols that are used in hot-water systems:

4.3.1 Vacuum relief valve (2)

4.3.2 Pipe carrying hot water (return) (2)

4.3.3 Automatic shut-off valve (2)

4.4 FIGURE 4.4 below shows an installation of a low-pressure geyser.



FIGURE 4.4

4.4.1 Name a suitable location to install this geyser. (1)

4.4.2 Recommend the most efficient direction in which this geyser must face. (1)

4.4.3 Predict what will happen if this system is installed higher than the tap. (1)

4.5 FIGURE 4.5 below shows a cross-sectional view of a component used in a low-pressure geyser.

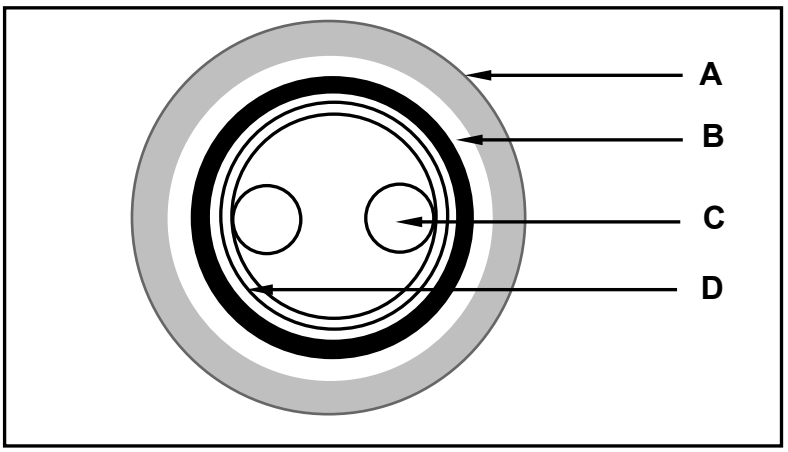


FIGURE 4.5

4.5.1 Name the component. (1)

4.5.2 Identify parts **B**, **C** and **D**. (3)

4.5.3 Name the material that **A** is made of. (1)

4.6 FIGURE 4.6 below shows a sketch of a 110 mm soil pipe that Grade 12 learners were required to install. The task was to connect and align the pipe and fittings, setting the fall correctly. Later, when the system was tested, there were leaks at the joints.

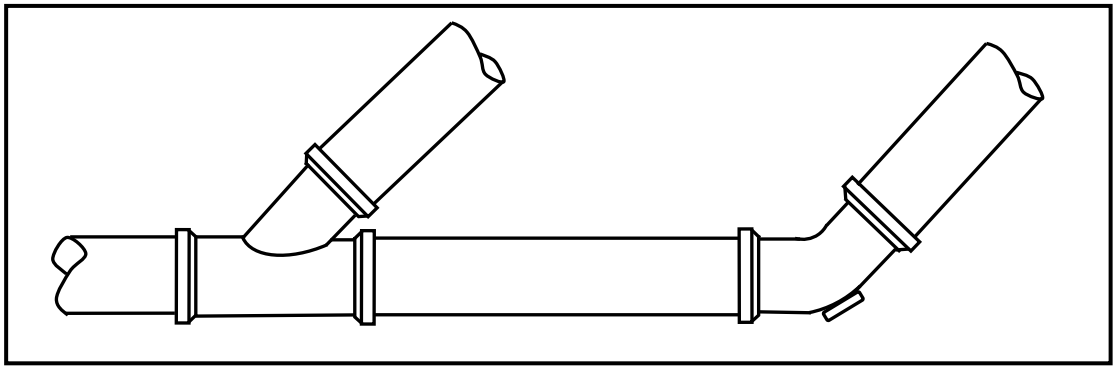


FIGURE 4.6

4.6.1 Name the TWO fittings that are shown in FIGURE 4.6 above. (2)

4.6.2 Give ONE possible reason why these fittings leaked. (1)

4.6.3 What is the recommended slope for the installation of this pipe system? (1)

4.7 FIGURE 4.7 below shows a fitting used in drains.



FIGURE 4.7

4.7.1 Name the fitting. (1)

4.7.2 Explain why plumbers use high-pressure water jetting instead of traditional drain rods. (2)

4.7.3 A plumbing team is testing a newly installed drainpipe using a compressed-air test apparatus. Predict what could happen if the wing nut on the sealing plug is not tightened correctly. (2)

4.8 FIGURE 4.8 below shows a tool used in plumbing.



FIGURE 4.8

4.8.1 Identify the tool. (1)

4.8.2 What type of lubricant should be used to grease the pistons of this tool? (1)

4.9 FIGURE 4.9 below shows a valve.

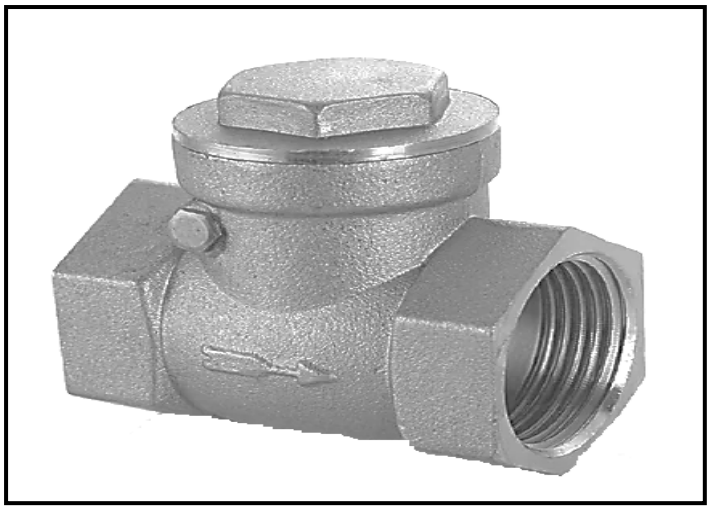


FIGURE 4.9

4.9.1 Identify the valve. (1)

4.9.2 What is indicated by the arrow on the side of the valve? (1)

4.9.3 Explain the working principles of this valve. (3)
[40]

QUESTION 5: GRAPHICS AS MEANS OF COMMUNICATION, ROOF WORK AND STORM WATER (SPECIFIC)

Start this question on a NEW page.

5.1 Various options are provided as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (5.1.1 to 5.1.5) in the ANSWER BOOK, e.g. 5.1.6 D.

5.1.1 The maximum dimensions for a surface channel is …

A 450 mm x 300 mm
B 1,5 m x 3 m
C 600 mm x 700 mm
D 3 m x 3,6 m (1)

5.1.2 Gutters are made of …

A galvanised sheet metal.
B polyvinyl chloride (PVC).
C aluminium.
D All the above-mentioned (1)

5.1.3 The … should be determined for the flashing for a ventilation pipe prior to installation.

A pitch of the roof
B number of tiles
C length of the ridge
D All the above-mentioned (1)

5.1.4 Galvanised gutters can be cut to the required length using a …

A pipe cutter.
B cross-cut saw.
C hacksaw.
D rip saw. (1)

5.1.5 The following must never be directed into the storm-water system:

A Raw sewage
B Water from the roof
C Foreign materials
D Only A and C (1)

5.2 FIGURE 5.2 shows two components that are used in a rainwater system.

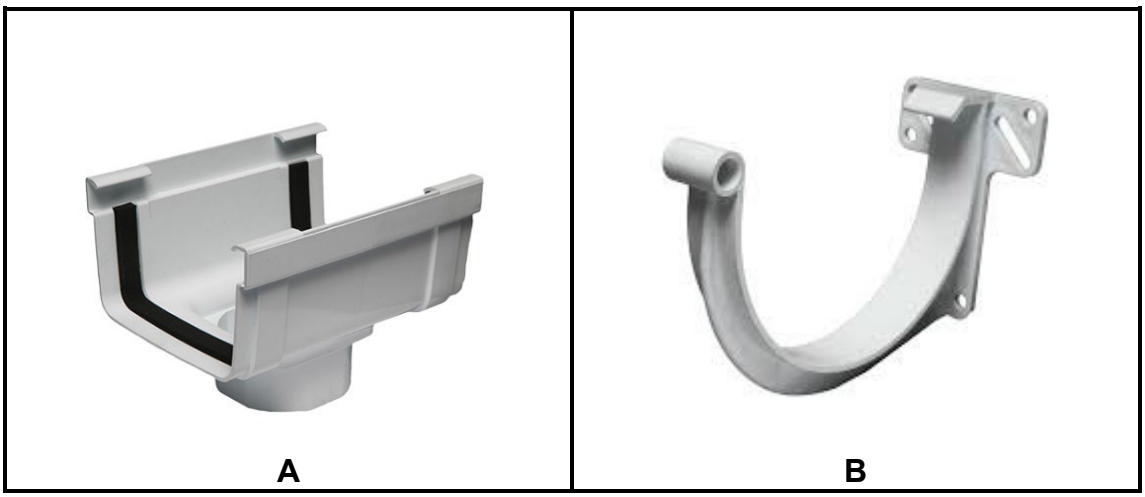


FIGURE 5.2

5.2.1 Identify **A** and **B**. (2)

5.2.2 Name the part that will be supported by **B**. (1)

5.3 Name ONE material used for the flashing of a ventilation pipe. (1)

5.4 Explain TWO responsibilities of the municipality regarding storm-water disposal. (2)

5.5 ANSWER SHEET 5.5 shows the front view and top view of an offset of a cylindrical downpipe.

Use the drawings and information given and draw the development of the downpipe that is indicated as **A**.

The pipe has a 3 mm seam on both sides.

Show ALL construction and projection lines.

Start your drawing at point **B**. (19)
[30]

QUESTION 6: SEWERAGE, SANITARY FITTINGS AND JOINING (SPECIFIC)

Start this question on a NEW page.

6.1 Complete the following sentences by using the word/term provided in the list below. Write only the word/term next to the question numbers (6.1.1 to 6.1.5) in the ANSWER BOOK, e.g. 6.1.6 Sludge.

copper; hydrochloric acid; capillary elbow; compression coupler; wiping solder; fine solder; lead-free solder; tin; patent flux

6.1.1 A … is soldered to copper pipes. (1)

6.1.2 … is suitable for the soldering of copper foil projects. (1)

6.1.3 … is the most suitable flux used when soldering galvanised mild steel. (1)

6.1.4 … is the most suitable solder used for soldering fittings to water pipes. (1)

6.1.5 The non-electric soldering iron has a head made of … (1)

6.2 FIGURE 6.2 shows an incomplete drawing of a compartment of a septic tank with a French drain that is located in a rural area where there is no municipal sewerage system.

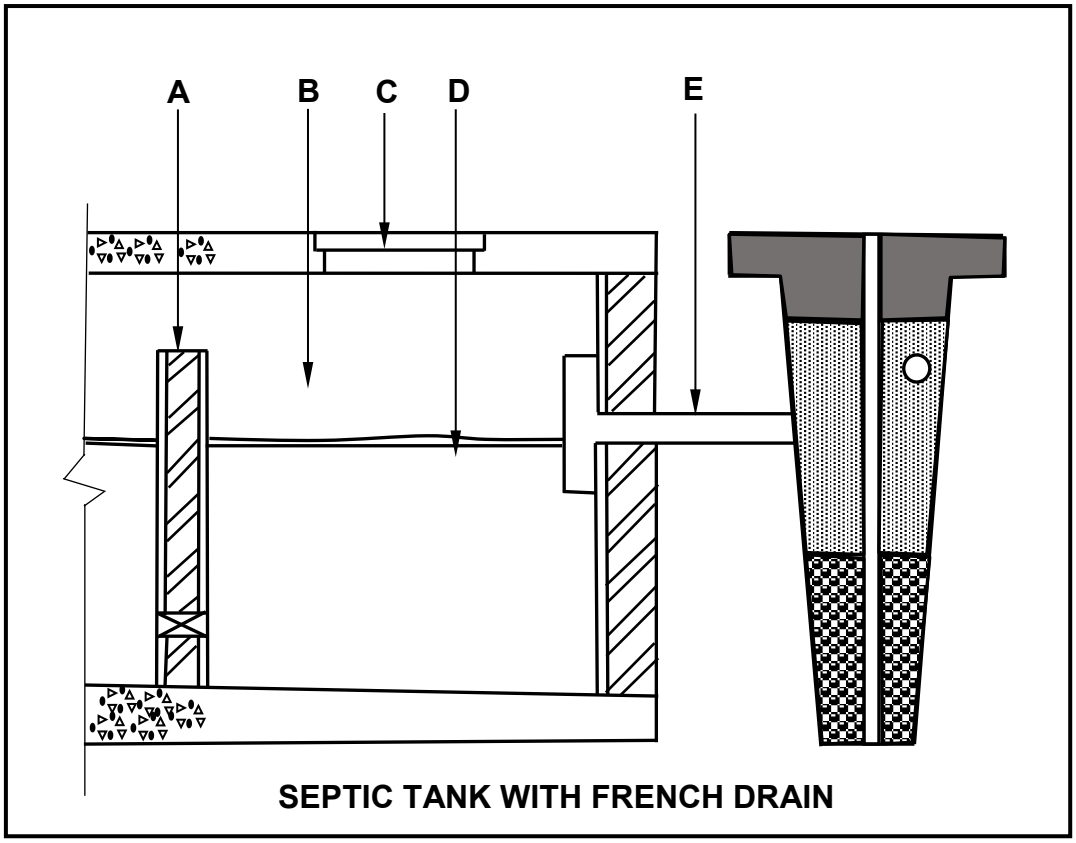


FIGURE 6.2

6.2.1 Identify parts **A**, **D** and **E**. (3)

6.2.2 Explain why the walls in compartment **B** are plastered. (1)

6.2.3 Explain the purpose of **C**. (1)

6.2.4 When does it become necessary for a septic tank to be cleaned out? (1)

6.2.5 What will influence the capacity of a septic tank? (1)

6.2.6 Describe the function of a French drain. (1)

6.2.7 Explain ONE disadvantage of channelling storm water into the French drain. (1)

6.2.8 Why should the French drain NOT be positioned close to boreholes? (1)

6.3 FIGURE 6.3 shows a drainage fixture that can be installed in a drainage system.

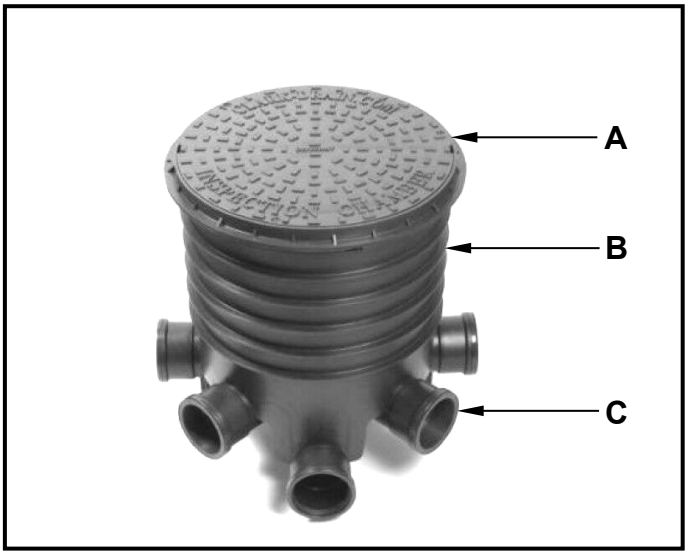


FIGURE 6.3

6.3.1 Identify the drainage fixture. (1)

6.3.2 Name parts **A**, **B** and **C**. (3)

6.3.3 What is the maximum depth of this drainage fixture? (1)

6.3.4 Explain ONE disadvantage of this drainage fixture. (1)

6.4 FIGURE 6.4 shows the installation of a shower.

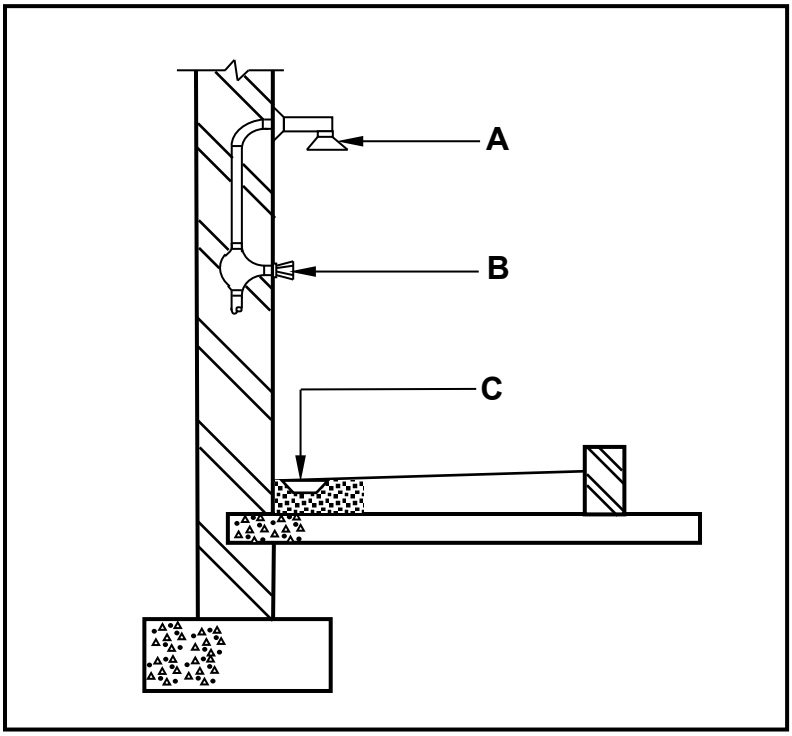


FIGURE 6.4

6.4.1 Name parts **A** and **B**. (2)

6.4.2 Name the component that needs to be installed at **C** to drain the water from the shower. (1)

6.4.3 What will determine the height for **A**? (1)

6.4.4 What is the diameter of the copper pipes that are generally used for showers? (1)

6.5 ANSWER SHEET 6.5 shows the floor plan of a dwelling and an outbuilding with an incomplete sewerage system.

Use ANSWER SHEET 6.5 to design and draw the sewerage layout for the dwelling and outbuilding. (14)
[40]

TOTAL: 200

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ANSWER SHEET 2

NO.	QUESTIONS	ANSWERS	MARKS
1.	What elevation is indicated in FIGURE **A**?		1
2.	Identify number **1**.		1
3.	Identify number **2**.		1
4.	Identify number **3**.		1
5.	What does the abbreviation FFL in FIGURE **A** represent?		1
6.	Write down the abbreviation for number **5**.		1
7.	Identify number **6**.		1
8.	Identify number **7** and indicate the total number of this fixture that is installed in the building.		2
9.	What is the distance between the wall and the end of the roof as indicated by number **8** called?		1
10.	Explain the purpose of number **9**.		1
11.	How many one-way double-pole switches are in the dwelling?		1
12.	How many water closets are installed in the building?		1
13.	Name TWO electrical installations that are omitted at number **10**.		2
14.	Identify number **11**.		1
15.	Deduce, from the notes column, the type of roof illustrated in FIGURE **A**.		1

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EXAMINATION NUMBER:													

16.	Deduce, from the notes column, what must be installed below each window.		1
17.	From what type of material should number **4** be manufactured?		1
18.	Deduce, from the notes column, the dimensions of window **1**.		2
19.	On which plot will the new dwelling be erected?		1
20.	Draw the symbol for plaster.		2
21.	Draw the symbol for earth fill.		3
22.	Calculate the floor area of the bathrooms that needs to be tiled. Give your answer in square metres and show ALL calculations.		5
23.	Calculate the total length of the wall on the western side of the building. Give your answer in metres and show ALL calculations.		8
		TOTAL:	**40**

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ANSWER SHEET 3.6

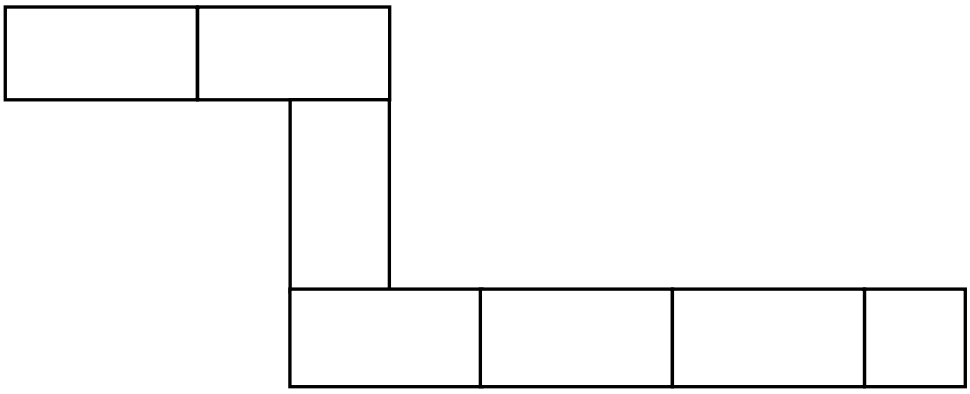


FIGURE 3.6

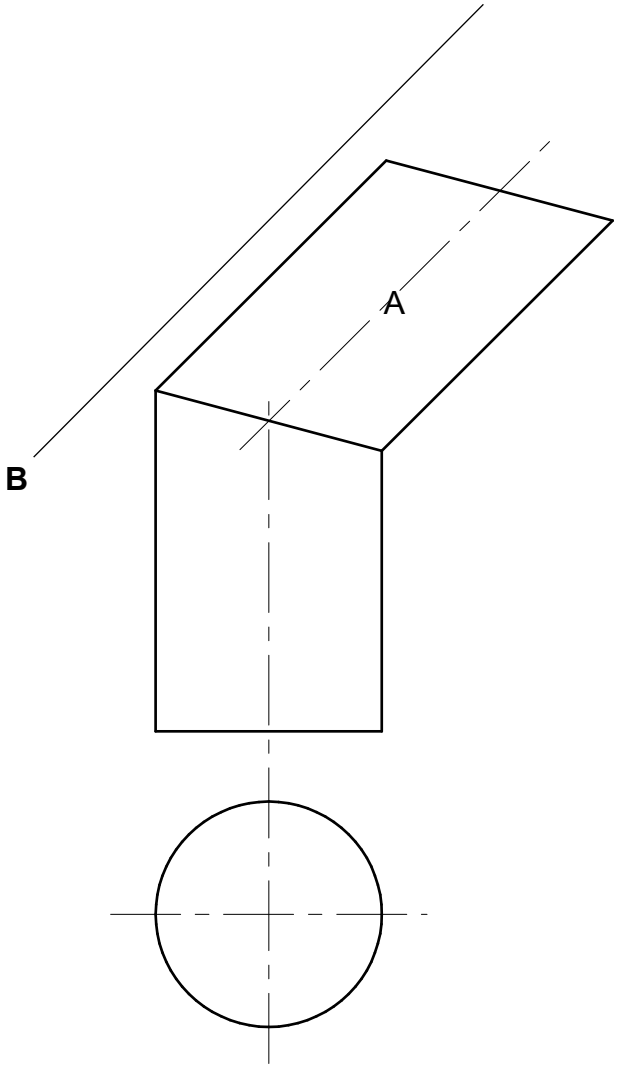
ASSESSMENT CRITERIA		
NO.	**MARK**	**CANDIDATE'S MARK**
1	1	
2	1	
3	6	
TOTAL:	**8**	

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EXAMINATION NUMBER:													

ANSWER SHEET 5.5



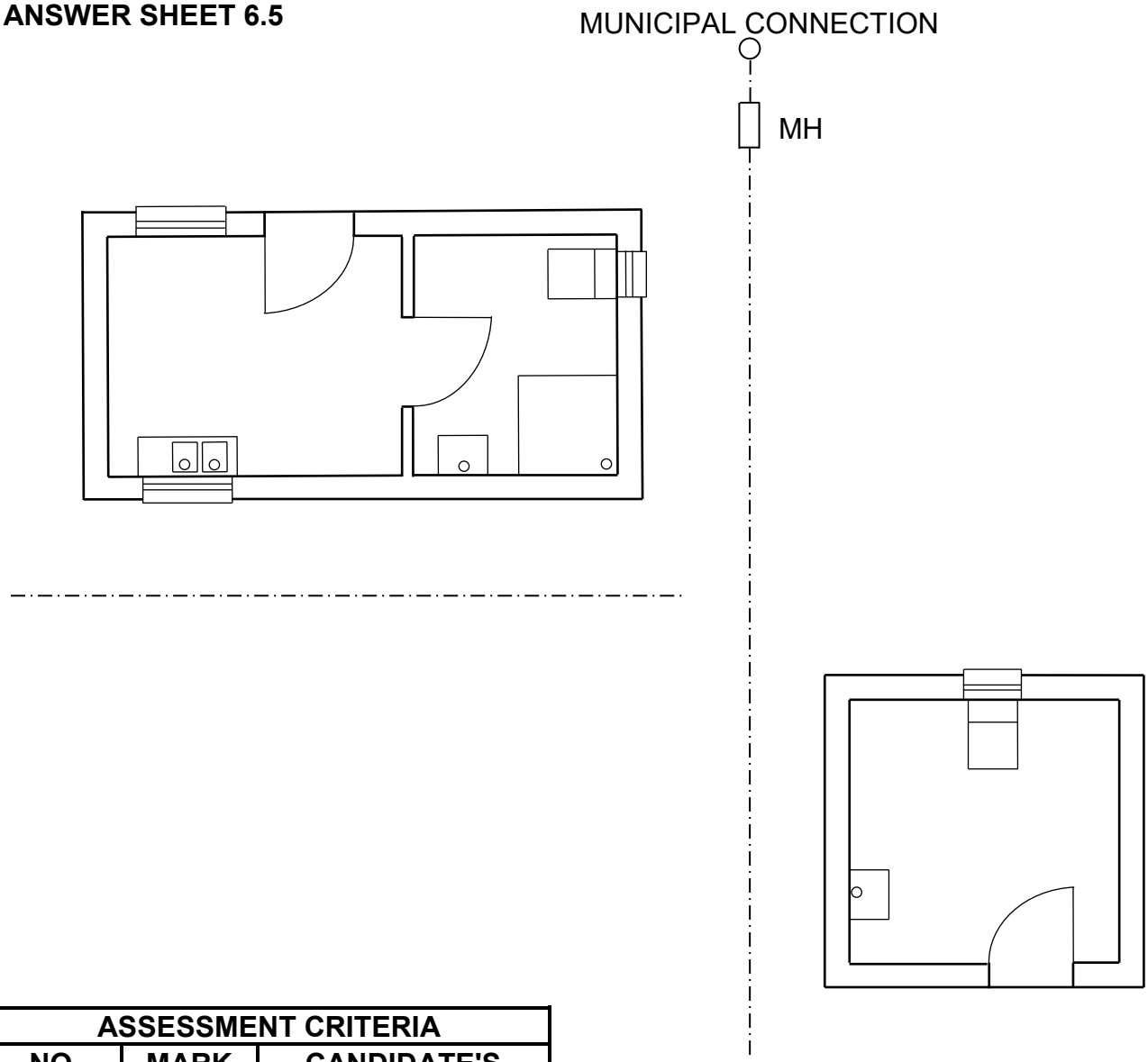
ASSESSMENT CRITERIA		
NO.	**MARK**	**CANDIDATE'S MARK**
1	1	
2	1	
3	1	
4	7	
5	7	
6	2	
TOTAL:	**19**	

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CENTRE NUMBER:							

EXAMINATION NUMBER:													

ANSWER SHEET 6.5



ASSESSMENT CRITERIA		
NO.	**MARK**	**CANDIDATE'S MARK**
1	4	
2	4	
3	2	
4	2	
5	1	
6	1	
TOTAL:	**14**	

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