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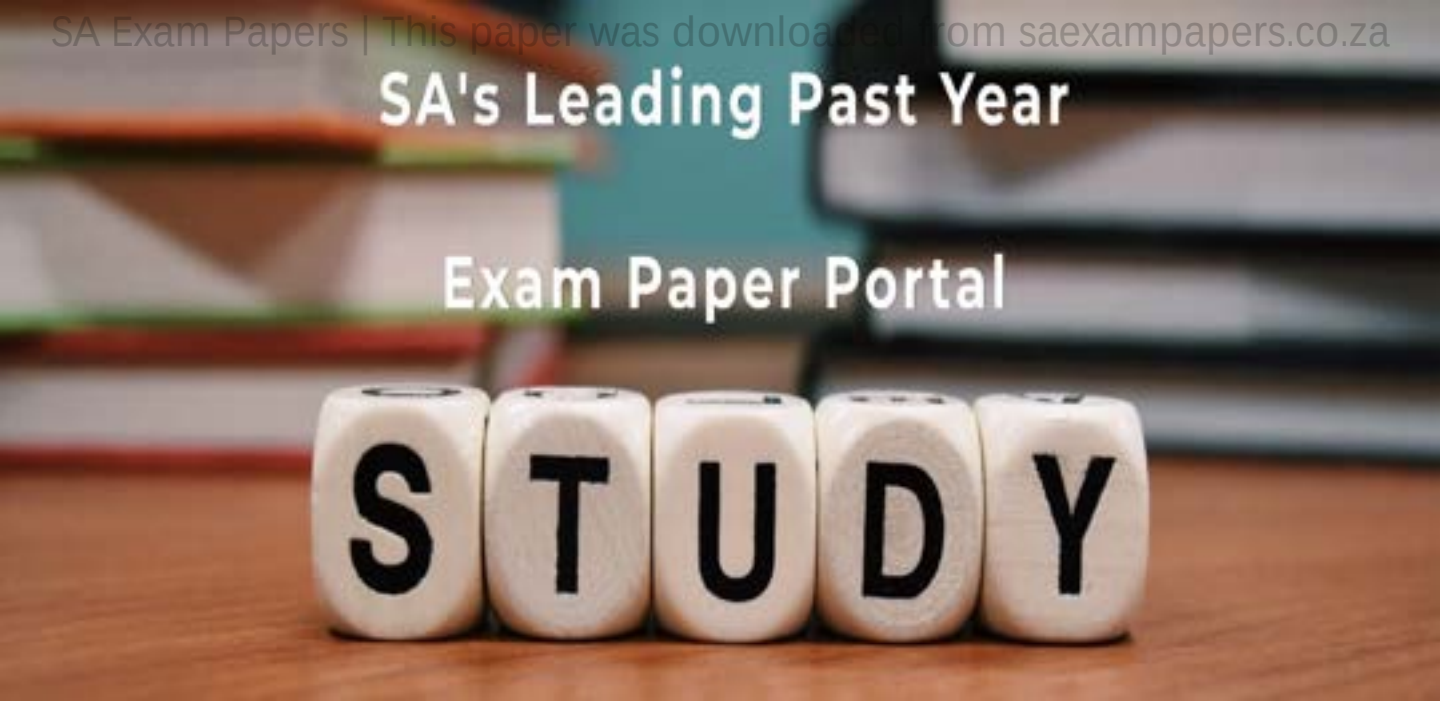

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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

CIVIL TECHNOLOGY: WOODWORKING

2023

MARKS: 200

TIME: 3 hours

This question paper consists of 14 pages and 7 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, 3.3, 3.4, 4.11, 5.5, 6.4 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 FIGURE 1.1 below shows a temporary platform that is currently not suitable for use in the building environment.

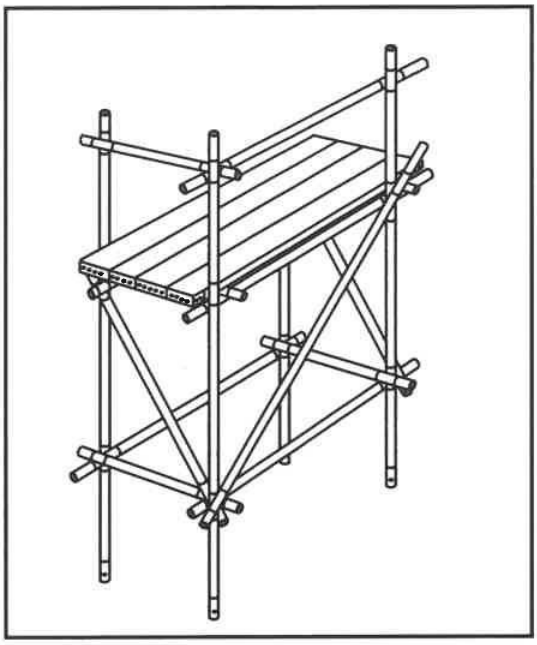

FIGURE 1.1

1.1.1 Identify THREE parts that have been omitted from the structure that will negatively impact on the safety of workers. (3)

1.1.2 Predict what could happen if the platform is used as shown in FIGURE 1.1. (2)

1.2 Choose the correct word(s) from those given in brackets. Write only the word(s) next to the question numbers (1.2.1 to 1.2.5) in the ANSWER BOOK, e.g. 1.2.6 casement.

1.2.1 Oil-based paint can be applied to protect ferrous metal against (shrinkage/rust/bending). (1)

1.2.2 Galvanising is the process to cover iron or steel with a layer of (aluminium/lead/zinc). (1)

1.2.3 The strength of concrete can be increased by (adding lime/keeping it moist/drying it quickly). (1)

1.2.4 Electroplating is the process of coating (metal/lead/plastic) with a thin layer of another material. (1)

1.2.5 Powder coating is the process of applying a (plastic/aluminium/copper) finish in powder form. (1)

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1.3 Explain why it is advisable to keep the height of the guard rails between 900 to 1 000 mm above the scaffold working platform. (1)

1.4 Describe ONE precaution that must be adhered to when storing a ladder. (1)

1.5 Workers and materials are in a builder's hoist. Describe ONE check that the operator needs to perform before the builder's hoist moves. (1)

1.6 Explain why the fire-fighting measures must be stated in the material safety data sheet of hazardous chemical substances. (1)

1.7 FIGURE 1.7 below shows joining fixtures.

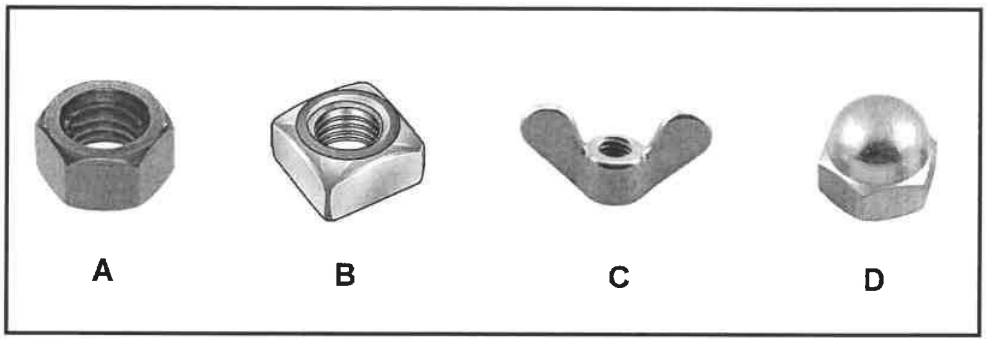

FIGURE 1.7

Identify **A** to **D**. (4)

1.8 A new building is being erected. Name the tool that can be used to:

1.8.1 Check if the height of doors and windows is at the same level (1)

1.8.2 Measure levels and slopes (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.

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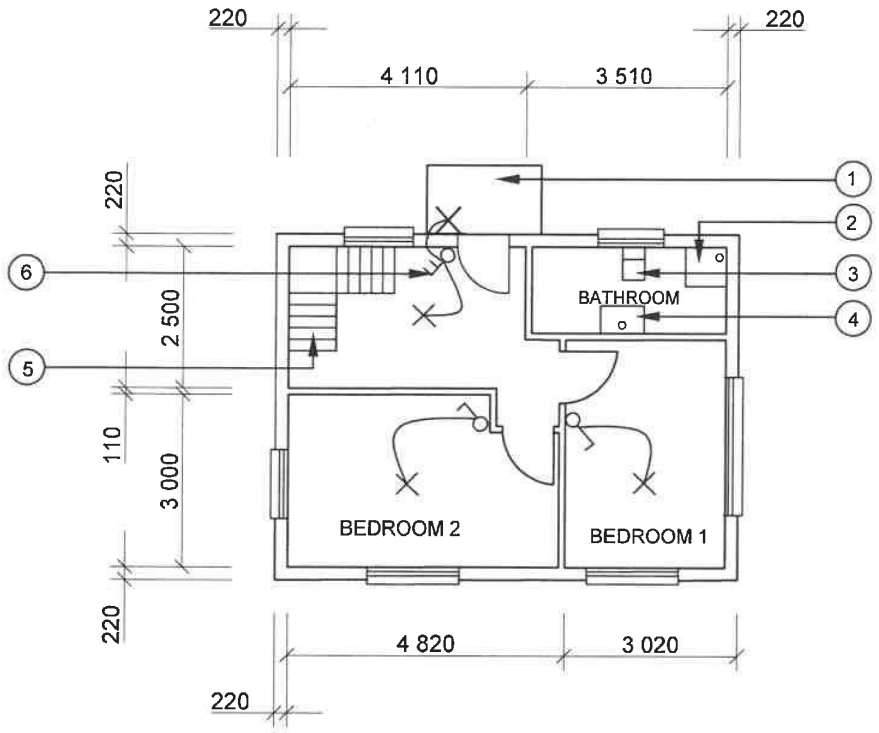

FIGURE A

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

Wall thickness: External = 220 mm
Internal = 110 mm

Architect's signature .....

Client's signature .....

Concrete stairs according to the engineer's specifications.

The ramp is finished off with paving.

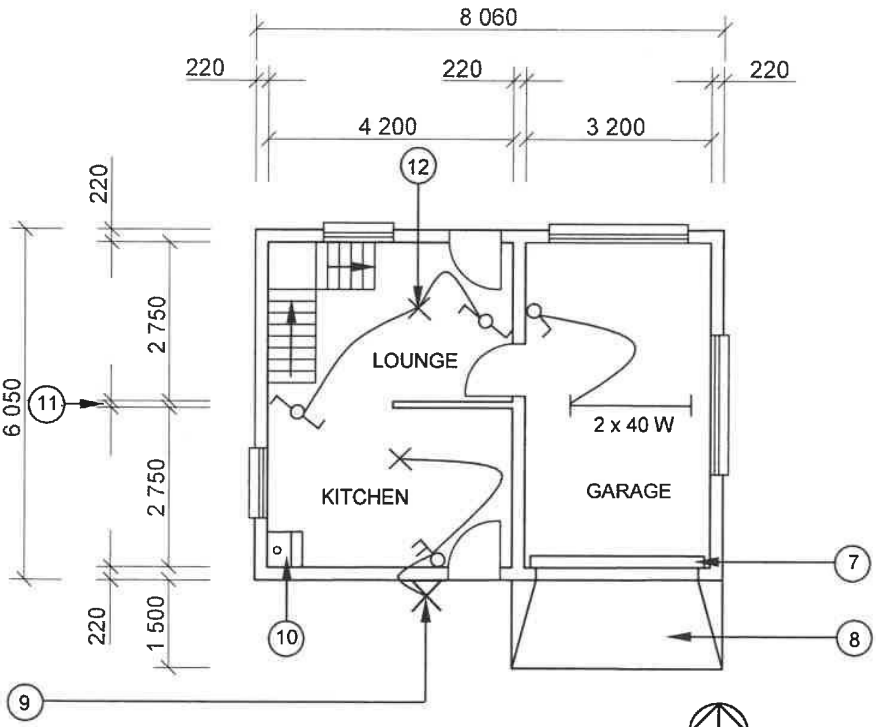

FIGURE B

REVISION 1	DATE: 26/03/2023	DRAWING OF STAIRCASE
REVISION 2	DATE: 28/03/2023	DRAWING OF LIGHT FITTINGS
PRINTED BY: XENO PRINTERS	DATE OF PRINT: 30/03/2023	
DRAWING TITLE: FLOOR PLANS PLOT 48		
PROJECT: PROPOSED DWELLING ON PLOT 48, BENONI		
PROJECT NO.: GR 488-820	DRAWING NO.: 226P7	
DATE: 24/03/2023	DRAWN: KB BAM	CHECKED: P KRIEL
FLOOR PLANS	SCALE 1 : 100	
REFERENCE CODE: QP 8 – 2023		

[40]

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QUESTION 3: CUPBOARDS, CASEMENTS, WALL-PANELLING AND QUANTITIES (SPECIFIC)

Start this question on a NEW page.

3.1 FIGURE 3.1 below shows the external elevation of a casement within a frame.

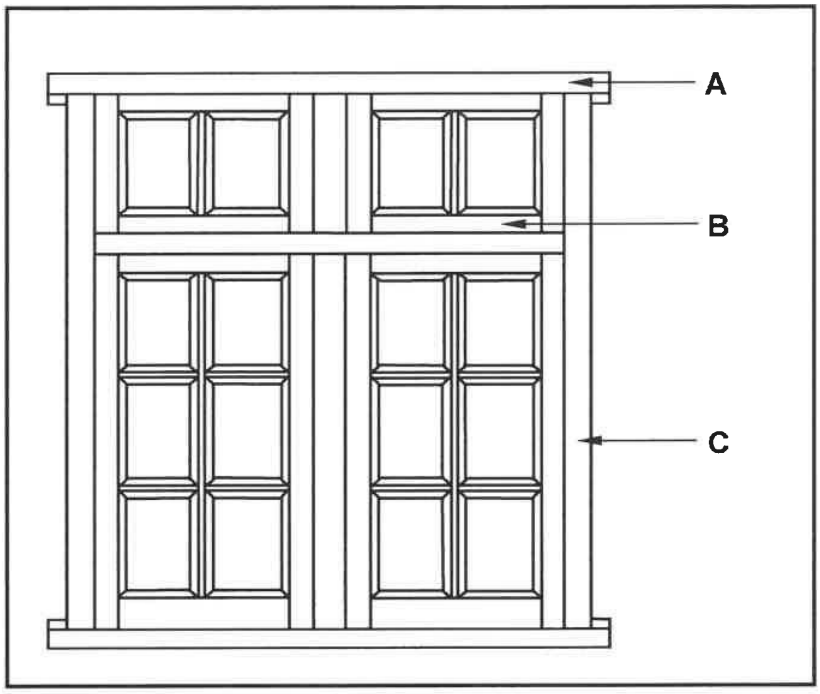

FIGURE 3.1

3.1.1 Identify the type of casement. (1)

3.1.2 Identify members **A** to **C**. (3)

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3.2 FIGURE 3.2 below shows the vertical section through the bottom part of the wall panelling.

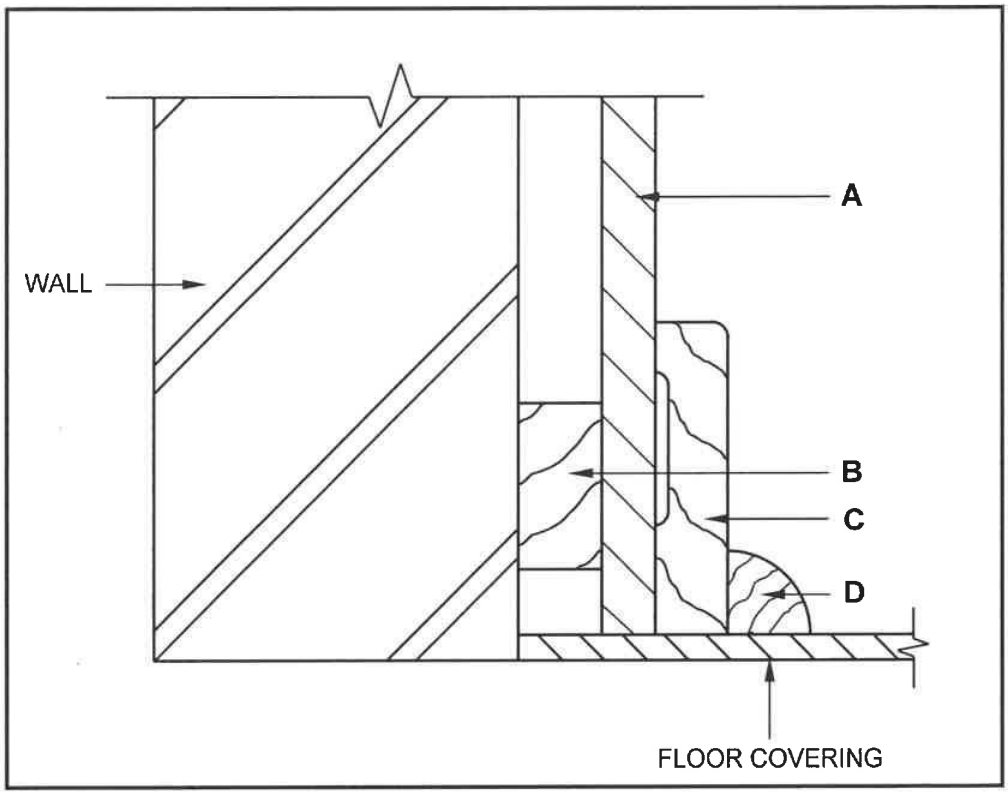

FIGURE 3.2

3.2.1 Identify **A** to **D**. (4)

3.2.2 Describe the function of **B**. (1)

3.2.3 What material is used for this specific part in **C**? (1)

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3.3 FIGURE 3.3 below shows the floor plan of a store room.

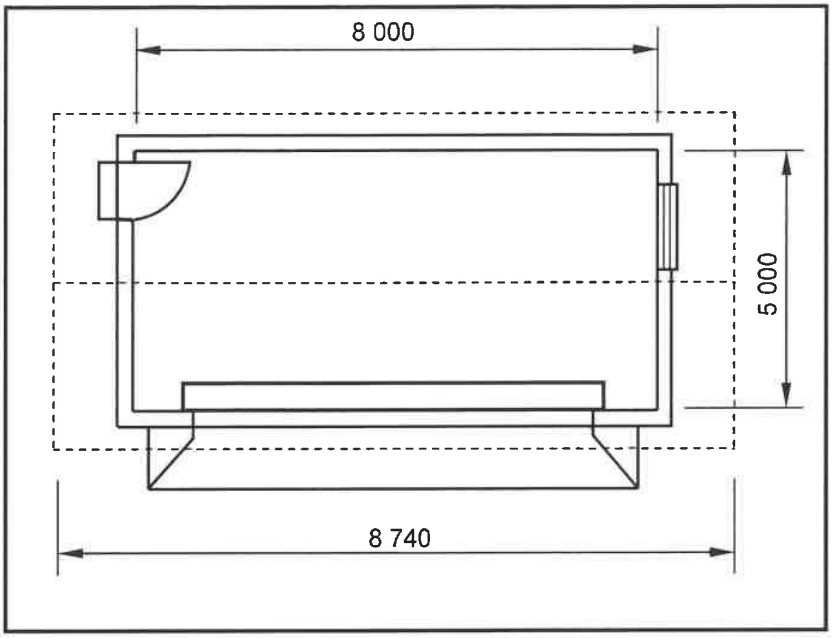

FIGURE 3.3

Use the following specifications:

- The roof is constructed with South African (Howe) roof trusses.
- The centre-to-centre spacing between the roof trusses is 500 mm.
- The length of a rafter is 3 600 mm.
- The overhang of the roof covering at the gutter is 50 mm.
- Show ALL calculations.

Use the dimension paper on ANSWER SHEET 3.3 and calculate the following:

3.3.1 The area of roof tiles needed. Round off your final answer to ONE decimal. (4)

3.3.2 The number of roof trusses needed (5)

NOTE: Marks will be awarded for the correct use of the dimension paper. (1)

3.4 Use ANSWER SHEET 3.4 and draw in good proportion the front view of a single free-standing cupboard without a door. The width of the cupboard is given on the ANSWER SHEET.

Use the following specifications:

- The cupboard has ONE bottom drawer with a handle.
- The cupboard consist of FOUR shelf spaces.
- 16 mm melamine board is used for the construction of the cabinet. (10)

[30]

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QUESTION 4: ROOFS, CEILINGS, TOOLS, EQUIPMENT AND MATERIALS (SPECIFIC)

Start this question on a NEW page.

4.1 Choose a description from COLUMN B that matches an 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	Eaves	A	positioned in the centre of the roof truss
4.1.2	Hinged trapdoors	B	portions of a roof that project beyond the outside walls
4.1.3	Couple roof truss	C	can only open towards the inside of the room/house
4.1.4	Roof covering	D	are nailed on top of the rafters
4.1.5	Lean-to roof truss	E	is fixed to the purlins or battens
4.1.6	South African (Howe) trusses	F	falls into the flat roof category and is appropriate over short spans
4.1.7	King post	G	consists of two rafters secured with a ridge beam
4.1.8	Purlins	H	consists of two rafters secured with a ridge beam and tie beam
		I	consists of two rafters and a horizontal beam
		J	consist of rafters, king posts, queen posts, a tie beam and struts
		K	is constructed by using only battens and purlins
		L	opens towards the inside of a room or towards the roof

(8 x 1) (8)

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4.2 FIGURE 4.2 below shows TWO woodworking machines.

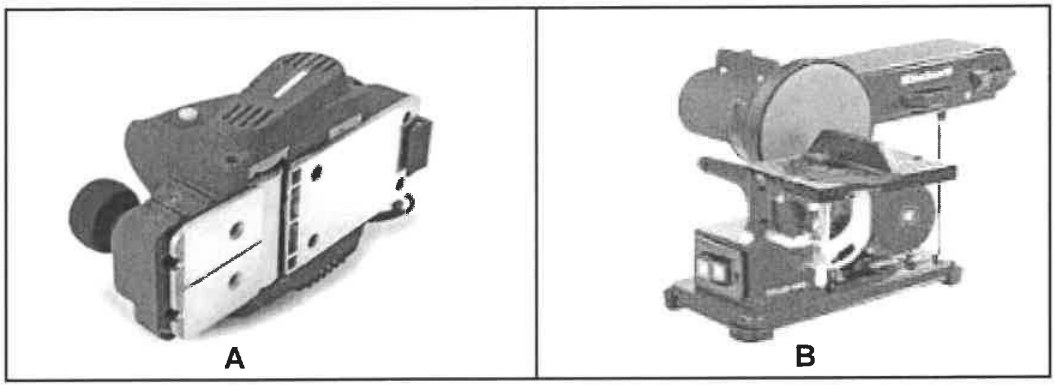

FIGURE 4.2

4.2.1 Identify machines **A** and **B**. (2)

4.2.2 Explain what care must be taken regarding the ventilation holes in **A**. (1)

4.2.3 Indicate TWO parts of machine **B** that must be replaced from time to time. (2)

4.3 Name TWO aspects that will determine the speed of the drill when working with a drill press. (2)

4.4 Name the attachment that can be used to help with the drilling of objects:

4.4.1 That cannot be held by hand (1)

4.4.2 When drilling cylindrical parts (1)

4.5 Name TWO preservatives that can be used to preserve timber. (2)

4.6 Explain TWO advantages of preserved timber. (2)

4.7 Describe TWO factors that must be taken into consideration when choosing a preservative for timber. (2)

4.8 Explain why timber should be graded. (1)

4.9 Name any THREE parts that are used in the construction of a conventional trap door. (3)

4.10 Name TWO types of roof covering that can be used to cover roofs, excluding tiles. (2)

4.11 ANSWER SHEET 4.11 shows part of a rectangular building with an incomplete hipped roof.

Use ANSWER SHEET 4.11 and complete the line diagram by drawing the layout of the roof trusses. (11)
[40]

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QUESTION 5: CENTERING, FORMWORK, SHORING AND GRAPHICS AS MEANS OF COMMUNICATION (SPECIFIC)

Start this question on a NEW page.

5.1 Various options are given 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 C.

5.1.1 Laggings are used in ... columns.

A square
B round
C rectangular
D All the above-mentioned (1)

5.1.2 The length of the vertical boards/clamps is equal to the ... of the column when using formwork for round columns.

A diameter
B circumference
C height
D B and C (1)

5.1.3 When erecting the formwork for a staircase, the risers must be fixed to the ...

A horizontal brace.
B vertical brace.
C bearer.
D None of the above-mentioned (1)

5.1.4 ... are used to indicate the position of the columns on the floor slab of multi-storey buildings.

A Corner blocks
B Kickers
C Sole plates
D Kick plates (1)

5.1.5 The distance between the ... will decrease towards the bottom of a column.

A yokes
B props
C battens
D A and C only (1)

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5.2 State TWO factors that will justify the use of steel shuttering in formwork. (2)

5.3 Shoring is used to support buildings during renovations.

5.3.1 Name the members that will be used to support a dead shore. (2)

5.3.2 Explain the purpose of steel dogs as used in shoring. (1)

5.4 Differentiate, by means of TWO line diagrams, between a *closed-couple roof truss* and a *king post roof truss*. Draw ONLY the trusses in your ANSWER BOOK. (9)

5.5 ANSWER SHEET 5.5 shows an incomplete front view of a part of the centering of a segmental arch.

Draw and complete the omitted members.

Do NOT draw any hidden detail nor any laggings.

Print any TWO labels. (11)
[30]

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QUESTION 6: SUSPENDED FLOORS, STAIRCASES, IRONMONGERY, DOORS AND JOINING (SPECIFIC)

Start this question on a NEW page.

6.1 FIGURE 6.1 below shows a lock.

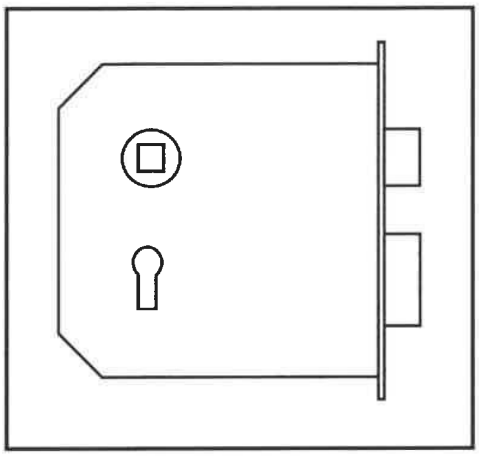

FIGURE 6.1

6.1.1 Identify the lock. (1)

6.1.2 Name ONE use of this lock. (1)

6.1.3 Name ONE other lock that also has a bolt and a latch. (1)

6.2 You are required to hang/join a timber door to a timber frame.

6.2.1 State the object that can be used to attach the door to the frame. (1)

6.2.2 Name the fastener that can be used to secure the object in your answer to QUESTION 6.2.1. (1)

6.3 Draw in your ANSWER BOOK a neat line diagram of the side view of a staircase with THREE stairs. Show ALL detail of the staircase and a landing at the top of the staircase. DO NOT draw the balusters. (6)

6.4 Use ANSWER SHEET 6.4 and draw to scale 1 : 10 the front elevation of a four-panel door with diminishing stiles and raised panels.

Use the following specifications:

- The outside dimensions of the door are 2 032 mm high and 813 mm wide
- Top rail 114 mm x 44 mm
- Diminishing stiles 75 mm x 44 mm
- Lock rail 220 mm x 44 mm
- Height to the top of the lock rail is 1 000 mm from the bottom of the door
- Muntin 75 mm x 44 mm
- Stiles 114 mm x 44 mm
- Bottom rail 220 mm x 44 mm (18)

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6.5 FIGURE 6.5 below shows a view of part of an incorrectly constructed suspended timber floor.

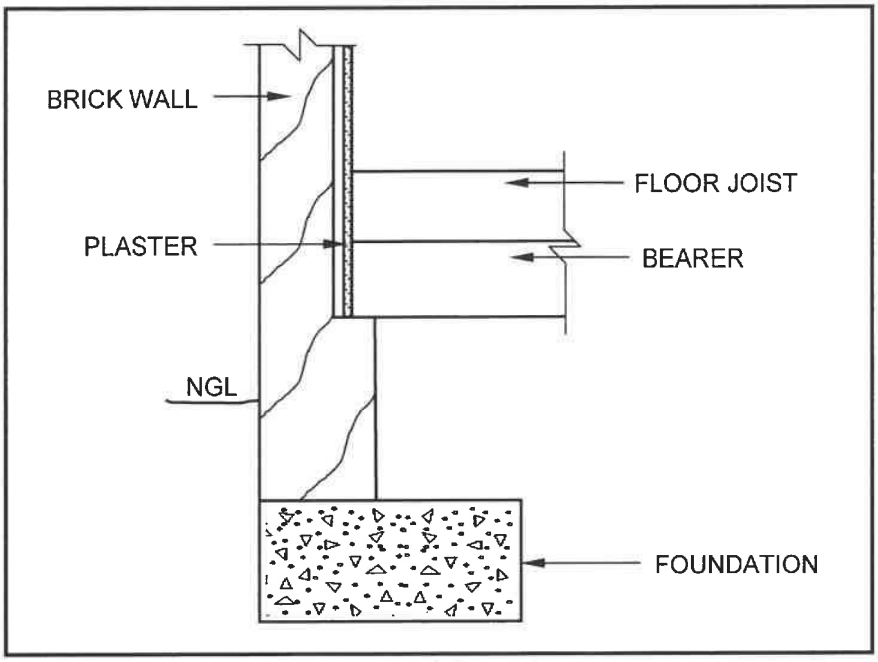

FIGURE 6.5

6.5.1 Identify FOUR faults in this floor construction. (4)

6.5.2 Use ANSWER SHEET 6.5 to complete and draw the correct layout of this floor construction. (7)
[40]

TOTAL: 200

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ANSWER SHEET 2

NO.	QUESTIONS	ANSWERS	MARK
1	Name the FIGURE that represents the first floor. Give ONE reason for your answer.		2
2	Deduce from the building plan the number of windows in the building.		1
3	Identify number **1**.		1
4	Identify number **2**.		1
5	Identify number **6**.		1
6	Identify number **8**.		1
7	Identify number **9**.		1
8	Identify number **10**.		1
9	Identify the number that indicates the garage door.		1
10	Deduce from the building plan the omitted dimension of number **11**.		1
11	Deduce from the building plan the material that must be used for number **5**.		1

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12	Give the abbreviations for the following: • Number **3** • Number **4**	Number **3**: Number **4**:	2
13	Describe the purpose of a two-way switch.		2
14	Recommend an appropriate floor covering for the kitchen.		1
15	Who was responsible for the checking of the drawing?		1
16	Deduce ONE fault in the bathroom in FIGURE **A**.		1
17	Name an alternative light source that can be used during load shedding for a dwelling.		1
18	State what was done during revision 1 and revision 2 of the house plan.	Revision 1: Revision 2:	2
19	Name the finish for the ramp as prescribed by the architect.		1
20	Draw the symbol for a damp-proof membrane.		2
21	Draw the symbol for finished wood.		2
22	Draw the symbol for hardcore filling.		2

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23	Prove, by means of a control test, that the total horizontal dimensions on the top and bottom of the plan in FIGURE **A** are the same.		8
24	Calculate the area of the floor plan in FIGURE **B**. Show ALL the calculations. Give your answer in m². Round off your answers to TWO decimal places.		3
		TOTAL:	**40**

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CENTRE NUMBER:							

EXAMINATION NUMBER:													

ANSWER SHEET 3.3

DIMENSION PAPER

	A	B	C	D	
3.3.1				Correct use of dimension paper	(1)
					(4)
3.3.2					
					(5)

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ANSWER SHEET 3.4

ASSESSMENT CRITERIA	**MARK**	**CM**
Correctness of cupboard	1	
Members	9	
TOTAL:	**10**	

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ANSWER SHEET 4.11

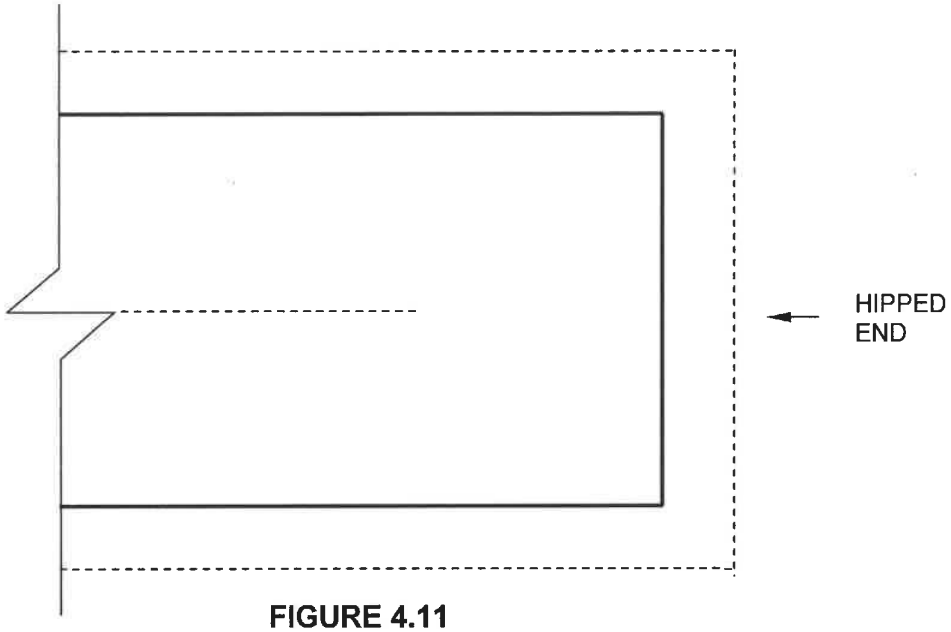

FIGURE 4.11

ASSESSMENT CRITERIA	MARK	CM
Correctness of roof layout	1	
Members	10	
TOTAL:	**11**	

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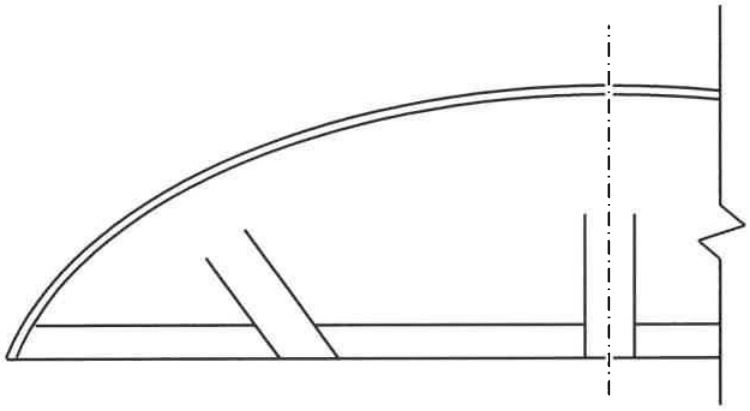
ANSWER SHEET 5.5



ASSESSMENT CRITERIA	MARK	CM
Correctness of segmental arch	1	
Members	8	
Any TWO labels	2	
TOTAL:	**11**	

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ANSWER SHEET 6.4

A

NOTE: Start your drawing in corner **A** at the top left of the ANSWER SHEET.

ASSESSMENT CRITERIA	MARK	CM
Correctness of the door	2	
Members	13	
Application of scale	3	
TOTAL:	**18**	

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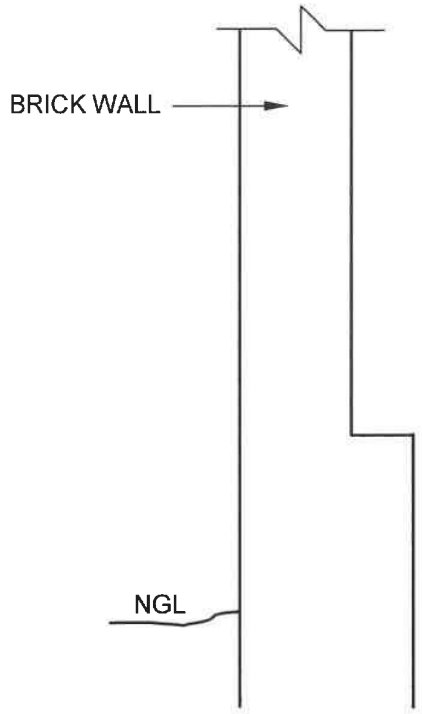
ANSWER SHEET 6.5



ASSESSMENT CRITERIA	MARK	CM
Correctness of floor construction	1	
Members	6	
TOTAL:	**7**	

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