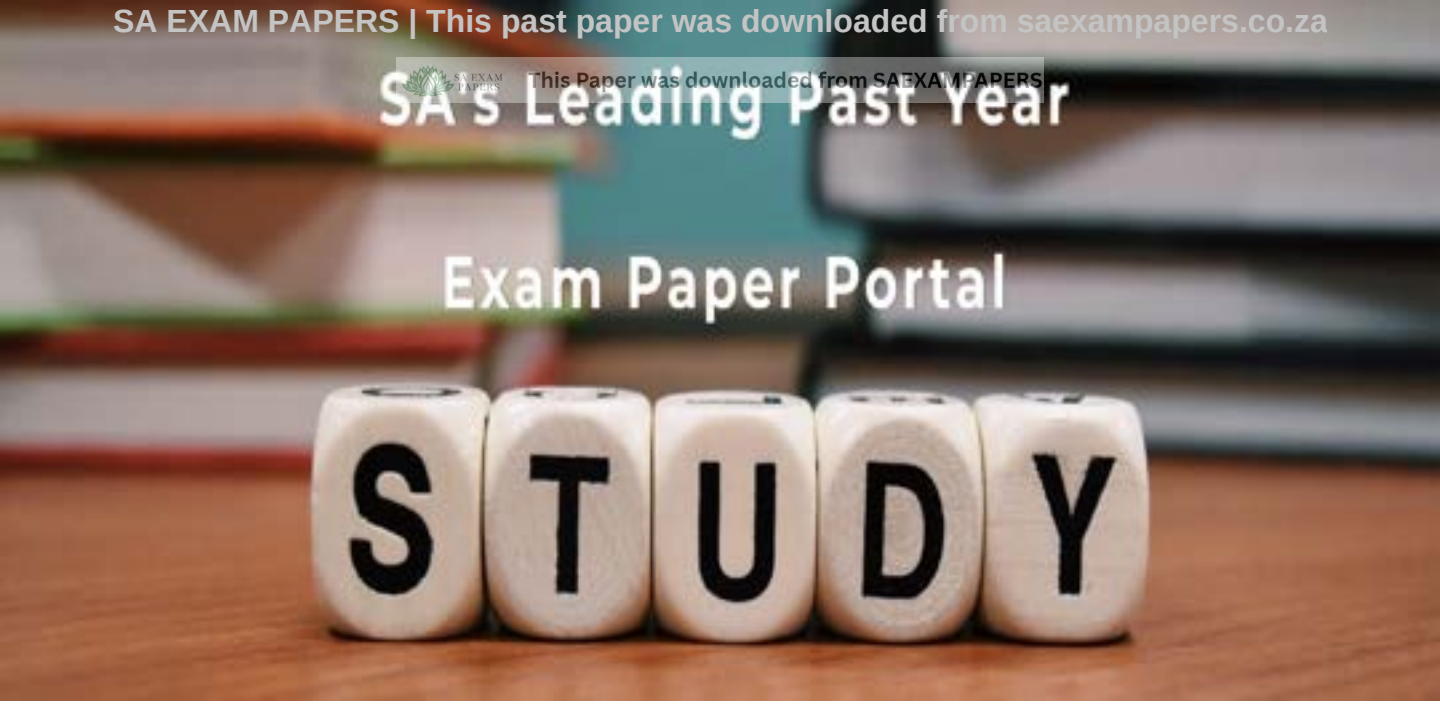

Province of the
EASTERN CAPE
EDUCATION

Iphondo leMpuma Kapa: Isebe leMfundo
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Porafensie Ya Kapa Botjahabela: Lefapha la Thuto

NATIONAL SENIOR CERTIFICATE

GRADE 12

SEPTEMBER 2025

CIVIL TECHNOLOGY: WOODWORKING

MARKS: **200**

TIME: **3 hours**

This question paper consists of 23 pages, including 6 answer sheets.

REQUIREMENTS:

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

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SIX questions: TWO questions are generic and FOUR questions are subject specific.
2. Answer ALL the questions.
3. Answer each question as a whole. Do NOT separate subsections of questions.
4. Start the answer to EACH question on a NEW page.
5. Do NOT write in the margins of the ANSWER BOOK.
6. You may use sketches to illustrate your answers.
7. Write ALL calculations and answers in the ANSWER BOOK or on the attached ANSWER SHEETS.
8. Use the mark allocation as a guide to the length of your answers.
9. 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.*
10. For the purpose of this question paper, the size of a brick should be taken as 220 mm x 110 mm x 75 mm.
11. Use your own discretion where dimensions and/or details have been omitted.
12. Answer QUESTIONS 2.2, 3.4, 3.5, 5.4, 6.3 and 5.9 on the attached ANSWER SHEETS using drawing instruments where necessary.
13. Write your NAME on every ANSWER SHEET and hand them in with your ANSWER BOOK, whether you have answered the question or not.
14. Due to electronic transfer, drawings in the question paper are NOT to scale.

QUESTION 1: SAFETY AND MATERIALS (GENERIC)

Start this question on a NEW page.

1.1 Identify the correct requirements regarding stairways used during construction:

1.1.1 Stairways that will not be a permanent part of the building under construction must have landings of at least **800 mm x 600 mm / 760 mm x 560 mm**, (1)

1.1.2 … for every **2,7 m / 3,7 m** or less vertical rise. (1)

1.1.3 Stairways must be installed at least **30º / 35º** (1)

1.1.4 … and no more than **60º / 50º** from the horizontal. (1)

1.1.5 Doors and gates opening directly into a stairway must have a platform that extends at least **510 mm / 910 mm** beyond the swing of the door or gate. (1)

1.2 Name any TWO materials that ladders are generally made of. (2 x 1) (2)

1.3 Name the TWO characteristics that define a builder's hoist. (2 x 1) (2)

1.4 Describe the difference of the surface finish between a *water-based paint* and *oil-based paint*. (2 x 1) (2)

1.5 Name any THREE properties of the curing process of concrete. (3 x 1) (3)

1.6 Name the THREE advantages of electroplating. (3 x 1) (3)

1.7 Briefly describe the process of powder coating. (2)

1.8 What is the main ingredient used in galvanising? (1)

[20]

QUESTION 2: GRAPHICS, JOINING AND EQUIPMENT (GENERIC)

Start this question on a NEW page.

2.1 Figure 2.1 on ANSWER SHEET A shows an incomplete floorplan of building, scale 1 : 100 is used.

Complete the floorplan by using the following information:

2.1.1	Outside door 2.1.A	(2)
2.1.2	Window 2.1.B	(2)
2.1.3	Water closet 2.1.C	(2)
2.1.4	Washbasin 2.1.D	(2)
2.1.5	Wash tub 2.1.E	(2)
2.1.6	One-way switch-single pole 2.1.F	(2)
2.1.7	Fluorescent light 2.1.G	(2)
2.1.8	Socket outlet 2.1.H	(2)
2.1.9	Grease trap 2.1.I	(2)
2.1.10	Wall light 2.1.J	(2)

2.2 FIGURE 2.2 below shows a surveying tool that is used on a construction site. Study the drawing and answer the questions that follow.

FIGURE 2.2

2.2.1	Identify the parts **A** to **C**.	(3)
2.2.2	Explain how you will take care of part **A**.	(2)

2.3 FIGURE 2.3 below shows the readings of a dumpy level on a telescopic staff. Answer the following questions with regard to the readings.

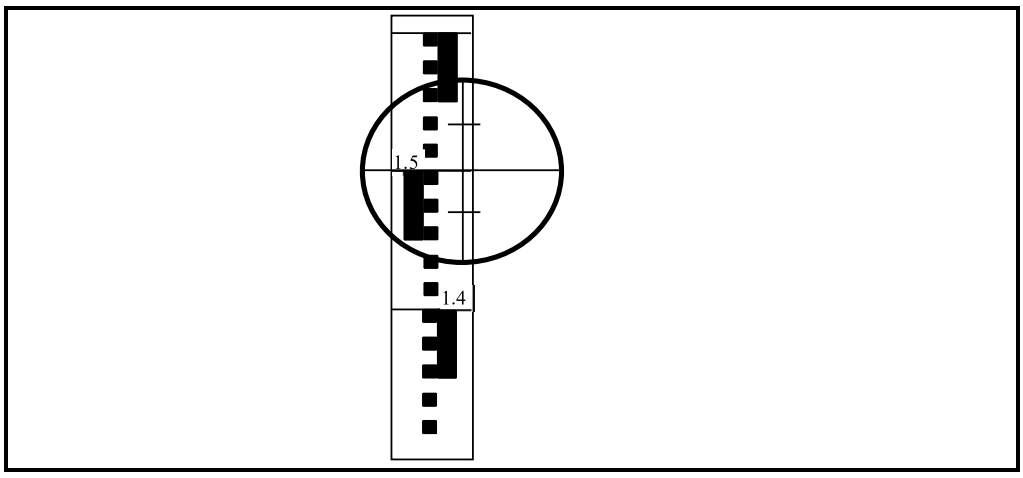


FIGURE 2.3

2.3.1 What is the height reading on the staff? (1)

2.3.2 What are the minimum and maximum distances that could be determined accurately on the staff? (2)

2.4 Name the maintenance measures for the multi-detector with reference to the following facets:

2.4.1 Cleaning method (1)

2.4.2 Storing over a long period (1)

2.5 Identify the types of nuts illustrated in **FIGURES A to C**.

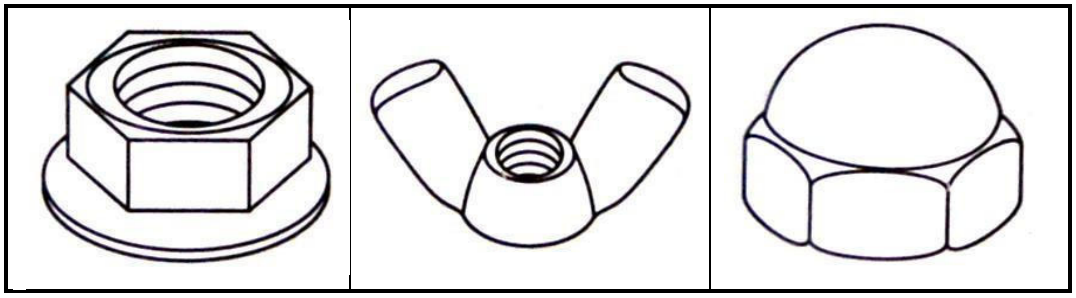
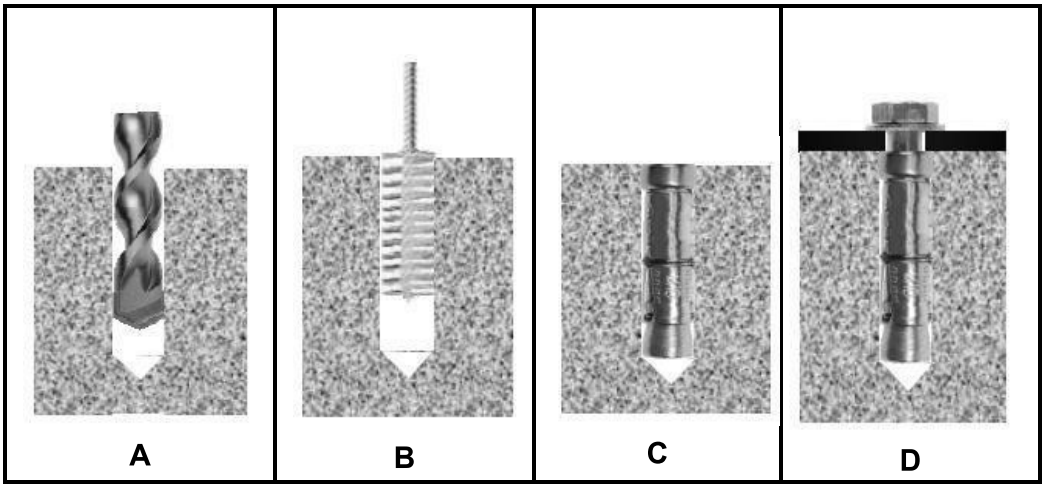


FIGURE A **FIGURE B** **FIGURE C** (3)

2.6 The pictures below illustrate the steps followed when fixing material to a floor with a fastener.



2.6.1 Identify the fastener that is used in **D**. (1)

2.6.2 Describe the steps from **A to D** above in your ANSWER BOOK. (4)

2.6.3 Justify the use of this fastener when securing the bracket of a heavy gate to a wall. (2)

[40]

TOTAL SECTION A: 60

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

Start this question on a NEW page.

3.1 Give ONE word/term for EACH of the following descriptions by choosing a word/term from the list below. Write only the word/term next to the question numbers (3.1.1 to 3.1.5) in the ANSWER BOOK, for example 3.1.6 Glazing bead.

Top rail, Window pane, Mullion, Drip groove, Casement, Fanlight, Sill, Glazing bars, Frame stile, Frame head, Front rail, Oval hanging rail

3.1.1 The bottom horizontal member of the casement frame fixed to the wall by means of horns. (1)

3.1.2 The small window above the opening of a door or window. (1)

3.1.3 The middle vertical member between casement stiles. (1)

3.1.4 The outer vertical members of the frame. (1)

3.1.5 It is used to fasten the cornice. (1)

3.2 Draw, in your ANSWER BOOK, a neat freehand sketch of the sectional view of only the top rail of a casement. (3)

3.3 FIGURE 3.3 below shows the sectional view of a tongue and groove wall panel from the floor to the ceiling, fastened to a 110 mm thick wall. Study the drawing and answer the questions that follow.

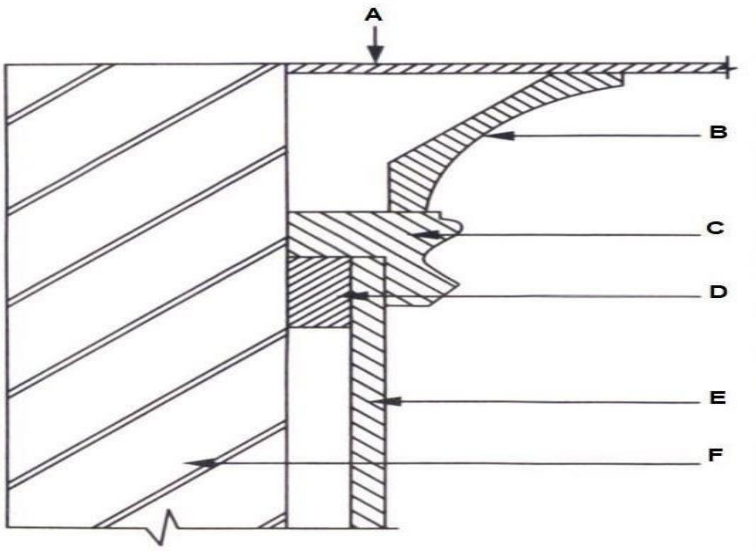


FIGURE 3.3

3.3.1 Identify parts **A–E.** (5)

3.4 FIGURE 3.4 below shows the built in-cupboard without the doors.
Use ANSWER SHEET **B** (3.4) and draw a vertical sectional view of the cupboard to scale 1 **:** 10.

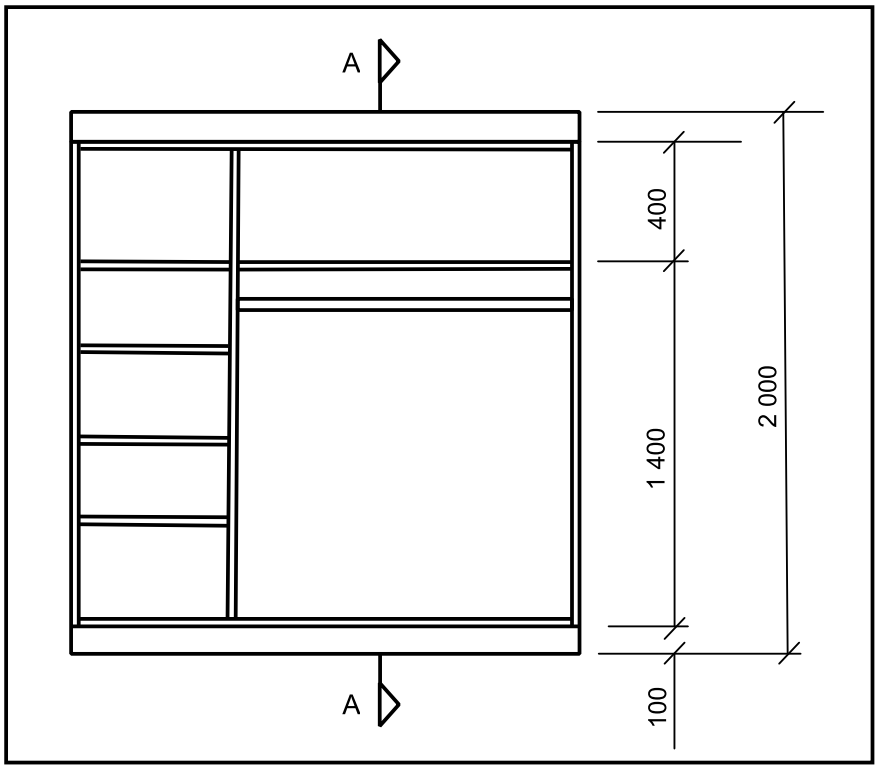


FIGURE 3.4

Use the following specification:

- All shelves and sides are 16 mm thick
- The back is 3 mm thick
- Depth of cupboard is 570 mm
- Show hanging rail in the sectional view (8)

3.5 FIGURE 3.5 below shows the floor plan of a building with a gable roof. The external measurements are 9 000 mm x 5 000 mm.

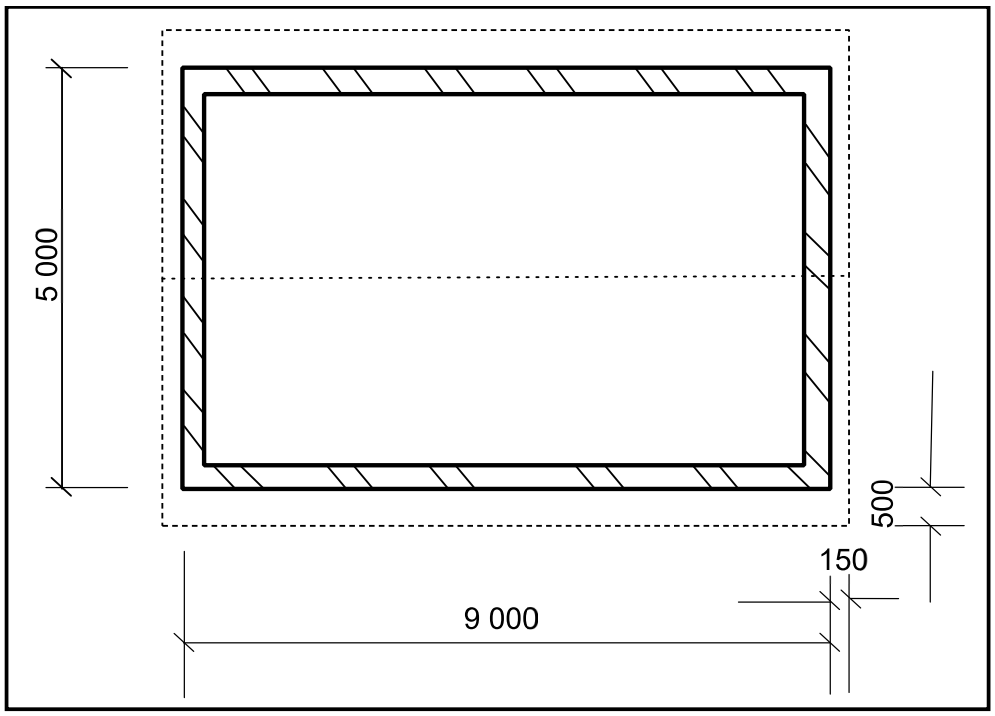


FIGURE 3.5

Use the following specifications:

- Walls are 220 mm thick
- South African roof truss
- Corrugated iron sheet is used as roof covering
- Cover width of the corrugated iron sheet is 610 mm
- True length of a rafter 2 900 mm
- Corrugated iron sheet projects 50 mm past the gutter

Use the dimension sheet on ANSWER SHEET **C** (3.5) and calculate the following:

3.5.1 The area of roof underlay for the building (5)

3.5.2 The total number of roofing sheets (4)

[30]

QUESTION 4: ROOFS, CEILINGS, TOOLS AND 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–H) next to the question numbers (4.1.1 to 4.1.6) in the ANSWER BOOK, for example 4.1.7 L.

	COLUMN A		COLUMN B
4.1.1	Lathe	A	stock should be fed slowly into the cutter
4.1.2	Orbital sander	B	ensure that all clamps and locking handles are locked in place before switching on the machine
4.1.3	Electric plane	C	ensure that the stock moves freely
4.1.4	Radial arm saw	D	ensure a clearance of 1 mm between the tip of the bit and the cutting edge of hollow chisel
4.1.5	Spindle moulder	E	do not apply pressure, the weight of the machine is enough
4.1.6	Mortising machine	F	to cut out circles, drill a hole through which to insert the blade
		G	check the timber for loose knots, nails and sand before planning
		H	lock the table height according to specific type of work

(1 x 6) (6)

4.2 FIGURE 4.2 below shows a woodworking machine. Study the picture and answer the questions that follow.

FIGURE 4.2

4.2.1 Identify the machine in FIGURE 4.2. (1)

4.2.2 Describe TWO safety precautions that should be taken to ensure safe handling of the blade. (2 x 1) (2)

4.2.3 Explain how you would take care of the blade. (2)

4.3 Selecting and preserving timber is essential for high quality work.

4.3.1 What does the number next to SABS symbol on the head of the timber indicate for commercial use? (1)

4.3.2 Explain the treatment of brushes between application of sanding sealer and upon completion of the work (2)

4.3.3 Name TWO different width of timber when selecting wood for roof trusses. (2)

4.4 Trap doors are fitted in a ceiling to allow access to roof space.

4.4.1 Name TWO parts of a conventional trap door. (2 x 1) (2)

4.4.2 Recommend measurements of timber that is commonly used for a trap door construction below the roof trusses. (2)

4.5 Name the different types of roof underlays for EACH of the following roofs:

4.5.1 Tiled roof (1)

4.5.2 Corrugated roof sheet (1)

4.5.3 Thatch roof (1)

4.6 Draw in your ANSWER BOOK a top view of a roof to show the valley between two inclined roofs. (3)

4.7 In modern construction a variety of methods is used to secure the components of roof trusses.
Differentiate by identifying the joining method that can be used in each of the following instances:

4.7.1 To fix purlins to roof trusses (1)

4.7.2 To prevent clay and concrete tiles from being lifted by strong winds (1)

4.7.3 Fixed to members of roof truss by means of permfix nails through pre-drilled holes to ensure effective connection (1)

4.8 FIGURE 4.8 below shows details of a corner of a hipped end. Study the drawing and answer the questions that follow.

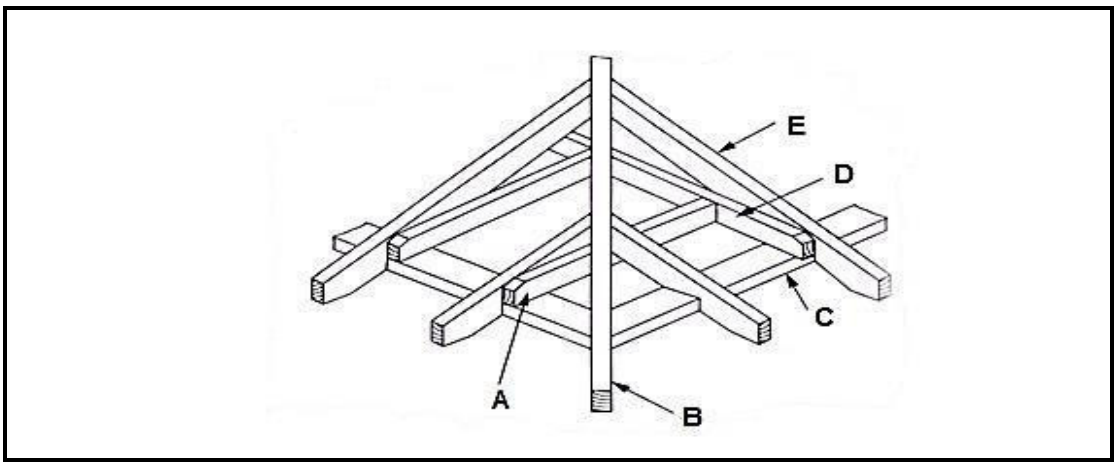


FIGURE 4.8

4.8.1 Identify parts **A–E.** (5)

4.8.2 Define a *hipped-end roof*. (2)

4.8.3 Explain what you understand about the eaves of a roof. (2)

4.8.4 Differentiate between an *open eave* and a *closed eave*. (2)

[40]

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

Start this question on a NEW page.

5.1 FIGURE 5.1 below shows the pictorial view of the construction details at the base of a centre. Study the picture and answer the questions that follow.

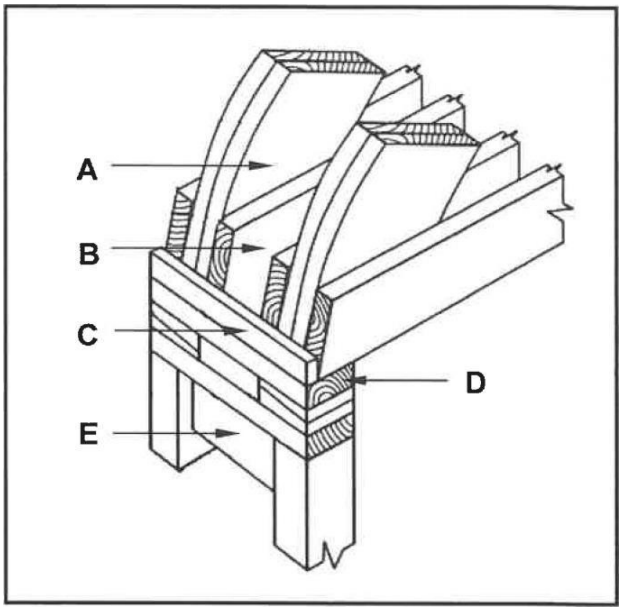


FIGURE 5.1

5.1.1 Identify parts **D** and **E.** (2)

5.1.2 Describe the purpose of part labelled **B**. (1)

5.2 The information given below are the stages on how to erect centre for segmental and semi-circular arches.
Analyse and rearrange the steps in the correct sequence. Write only the numbers of the statements in your ANSWER BOOK. (5)

5.2.1 Place the sleeper or soleplate for the props in a level position on the ground.

5.2.2 Position the props on the sleepers against the reveals of the opening.

5.2.3 Build the wall up to the height of the springing line of the arch.

5.2.4 Insert the bearer and folding wedges at the top of the props.

5.2.5 Ensure that the span is correct.

5.3 Draw in your ANSWER BOOK, in good proportion, a single-line diagram of a SA (Howe) roof truss. Label any ONE part of the truss. (9)

5.4 ANSWER SHEET **D** (5.4) shows the incomplete formwork for a square column. Use ANSWER SHEET **D** (5.4) and complete it by drawing in good proportion the horizontal section through a square column. (7)

5.5 Draw in your ANSWER BOOK, in good proportion, a neat two-dimensional sketch of the detail of the base of a dead shore.

Show the following on your drawing:

- Dead shore
- Folding wedges
- Soleplate
- Steel dog
- Any ONE label (6)

[30]

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

Start this question on a NEW page.

6.1 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 (6.1.1 to 6.1.5) in the ANSWER BOOK, for example 6.1.6 E.

6.1.1 In suspended timber floors, longitudinal edges of the floor boards should be at least … from the plaster to allow movement.

A 21 mm
B 6 mm
C 12 mm
D 8 mm (1)

6.1.2 Vertical member between two consecutive treads.

A Rise
B Newel post
C Tread
D Riser (1)

6.1.3 It is screwed onto the internal surface of the door.

A Mortise lock
B Rim lock
C Straight cupboard lock
D Drawer or till lock (1)

6.1.4 Tall, narrow units placed on the sides of entry doors.

A Fanlights
B Side lights
C Mullion
D Muntin (1)

6.1.5 IBR sheeting and corrugated iron sheets are secured to purlins with ...

A hurricane clips.
B roofing nails.
C truss hanger.
D gang nail. (1)

6.2 Draw in your ANSWER BOOK in good proportion, two horizontal sectional views to show the difference between a door frame and jamb lining fixed to a wall. Print the title below EACH of the drawings. (6)

6.3 ANSWER SHEET **E** (6.3) shows the isometric view of the rail of haunched mortise and tenon joint.
Use ANSWER SHEET **E** (6.3) and draw the isometric view of the adjoining stile No hidden details are required. (6)

6.4 FIGURE 6.4 below shows a part of a suspended timber floor. Identify parts labelled **6.4.1** to **6.4.6**.

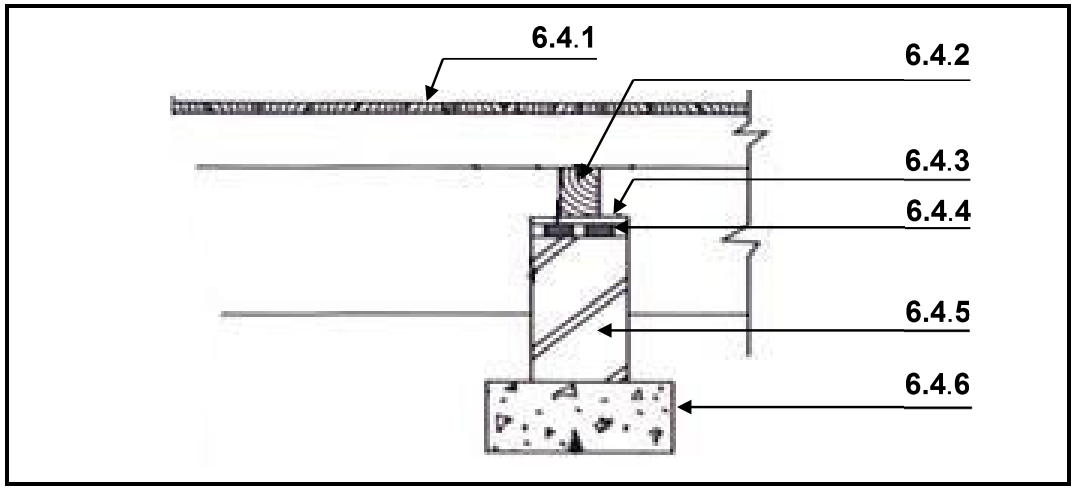


FIGURE 6.4 (6)

6.5 Briefly motivate why all debris below suspended timber floor must be removed. (2)

6.6 Differentiate between the *mortise lock* and *night latch* with regard to their placement and functions. (4)

6.7 FIGURE 6.7 below shows two methods of joining floor joists to wall in upper level suspended timber floor.

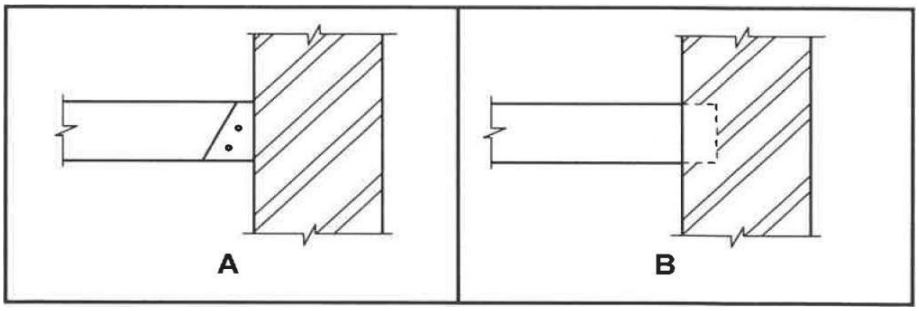


FIGURE 6.7

6.7.1 Describe the joining methods used to join the floor joists to wall in **A** and **B** respectively. (2)

6.7.2 Justify why you would prefer method **A**. (1)

6.8 FIGURE 6.8 on ANSWER SHEET **F** (6.8) shows the top view of a wall around a staircase. Use ANSWER SHEET **F** (6.8) and draw in good proportion the top view of a flight of stairs with an open well and half-landing within the given wall. (6)

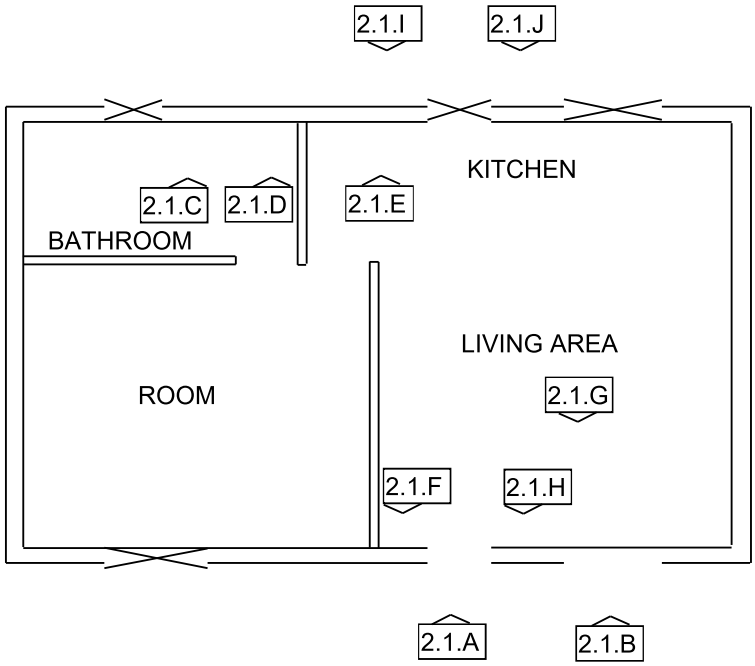
6.9 Explain TWO purposes of handrail in staircase construction. (2)

[40]

TOTAL: 200

ANSWER SHEET	A	CIVIL TECHNOLOGY (GENERIC)	NAME AND SURNAME:	

2.1 Use the information on ANSWER SHEET A and complete the floor plan on scale 1 : 100. (20)



Outside door 2.1.A	2	
Window 2.1.B	2	
Water closet 2.1.C	2	
Washbasin 2.1.D	2	
Wash tub 2.1.E	2	
One-way switch-single pole 2.1.F	2	
Fluorescent light 2.1.G	2	
Socket outlet 2.1.H	2	
Grease trap 2.1.I	2	
Light wall mounted 2.1.J	2	
TOTAL	**20**	

ANSWER SHEET	B	CIVIL TECHNOLOGY SPECIFIC	NAME AND SURNAME	

Use ANSWER SHEET B (3.4) and draw a vertical sectional view of the cupboard to scale 1 : 100.

ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Front rail	1	
Top shelf	1	
Middle shelf	1	
Hanging rail	1	
Kick plate	1	
Back of base	1	
Back of cupboard	1	
Application of scale:	1	
TOTAL:	8	

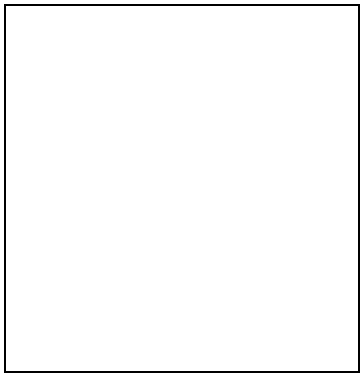
ANSWER SHEET	C	CIVIL TECHNOLOGY (SPECIFIC)	NAME AND SURNAME:	

DIMENSION PAPER

	A	B	C	D
3.5.1				
3.5.2				

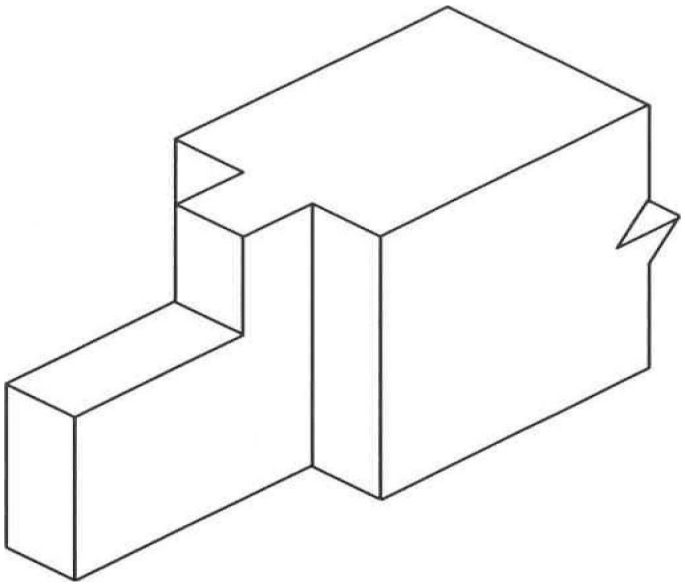
ANSWER SHEET	D	CIVIL TECHNOLOGY (SPECIFIC)	NAME AND SURNAME:	

Use ANSWER SHEET D (5.4) and complete by drawing in good proportion, the horizontal section through square column.



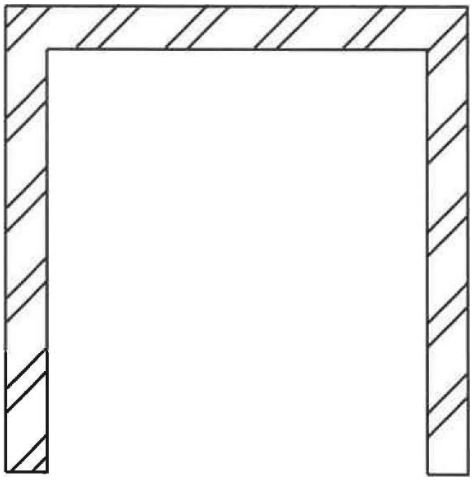
ASSESSMENT CRITERIA	MARK	CANDIDATES MARK
Members	6	
Correctness of drawing	1	
TOTAL	**7**	

ANSWER SHEET **E**	CIVIL TECHNOLOGY (SPECIFIC)	NAME AND SURNAME	



NO	ASSESSMENT CRITERIA	MARK
1	Correctness of stile	1
2	Parts of the stile	5
	TOTAL:	**6**

ANSWER SHEET	F	CIVIL TECHNOLOGY (SPECIFIC)	NAME AND SURNAME:	



ASSESSMENT CRITERIA	MARK	CANDIDATE'S MARK
Members	5	
Correctness of drawing	1	
TOTAL:	**6**	