



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

NOVEMBER 2024

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

Barcode label

DO NOT FOLD THE QUESTION PAPER IN HALF.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. ALL drawings are in first-angle orthographic projection, unless otherwise stated.
4. ALL drawings must be prepared using pencil and instruments, unless otherwise stated.
5. ALL answers must be drawn accurately and neatly.
6. ALL the questions must be answered on the QUESTION PAPER, as instructed.
7. ALL the pages, irrespective of whether the question was attempted or not, must be re-stapled in numerical sequence in the TOP LEFT-HAND CORNER ONLY.
8. Time management is essential in order to complete all the questions.
9. Print your examination number in the block provided on every page.
10. Any details or dimensions not given must be assumed in good proportion.

FOR OFFICIAL USE ONLY															
QUESTION	MARKS OBTAINED			$\frac{1}{2}$	SIGN	MODERATED			$\frac{1}{2}$	SIGN	RE-MARKING			$\frac{1}{2}$	SIGN
1															
2															
3															
4															
TOTAL															
	2	0	0			2	0	0			2	0	0		

FINAL CONVERTED MARK

100

CHECKED BY

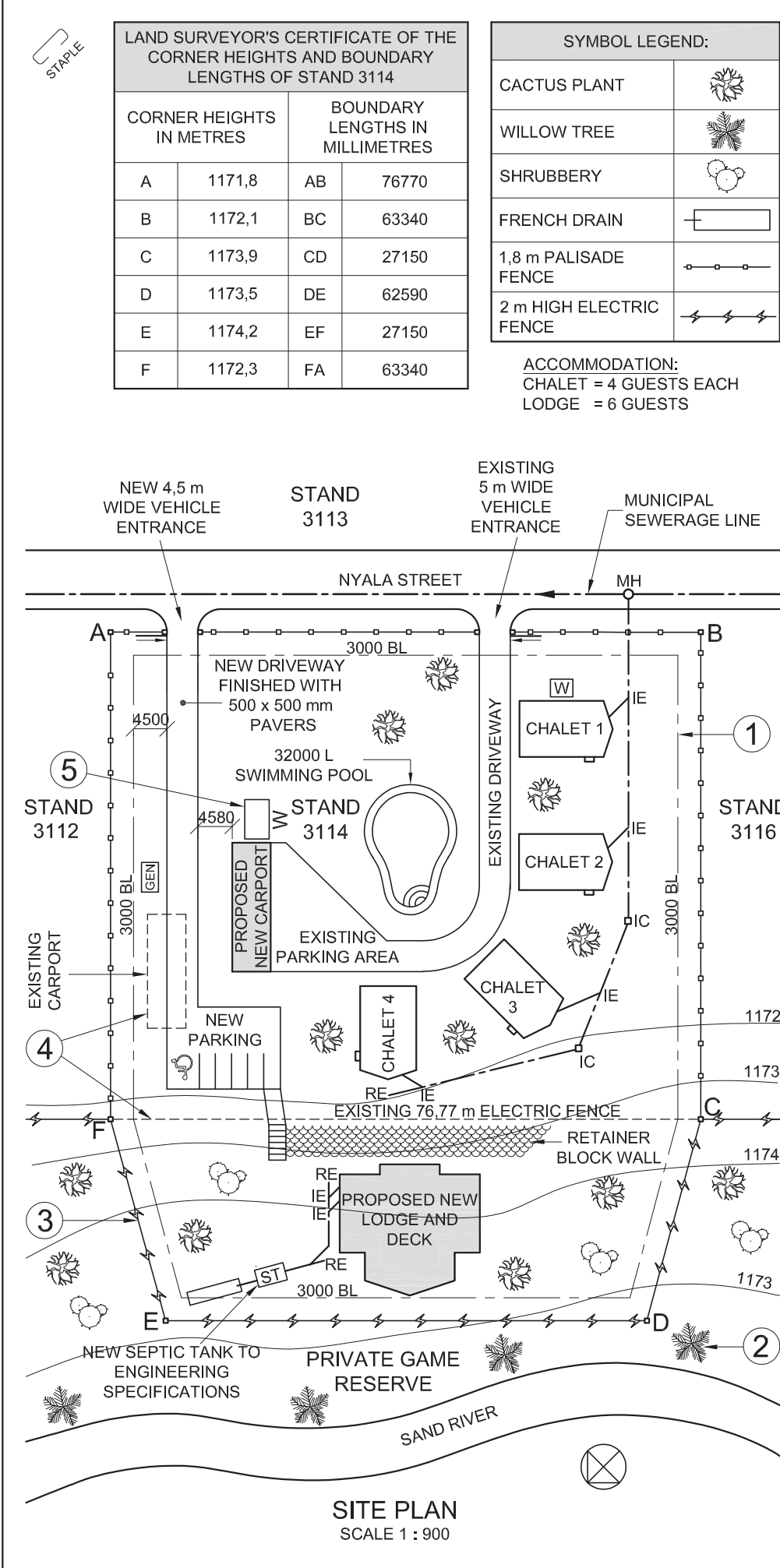
COMPLETE THE FOLLOWING:

CENTRE NUMBER

CENTRE NUMBER

EXAMINATION NUMBER

EXAMINATION NUMBER



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

ARCHITECT'S SIGNATURE:

CLIENT'S SIGNATURE:

ANSWER 20
In the space below, draw, in neat freehand, the *SANS 10143* graphical symbol for:
(a) The front view of a BIDET
(b) An electrical REGULATING SWITCH/DIMMER

(a) BIDET

(b) Electrical REGULATING SWITCH/DIMMER

2	22/11/2023	ADD WATER TANK
1	17/11/2023	MOVE FRENCH DRAIN
REVISION	DATE	DESCRIPTION

HSJ ARCHITECTS
27 ORIBI DRIVE
KRUGER HILL
POLOKWANE
4059

www.safari-plus.co.za
019 405 9777

PRINTED BY:	DATE OF PRINT:
CHEETAH PRINTERS	26/10/2023

DRAWING TITLE:
SITE PLAN

PROJECT:
PROPOSED NEW LODGE, DECK AND CARPORT FOR MR D BRITS, ON STAND 3114, 7 NYALA STREET, TUGELA RIVER, LIMPOPO

PROJECT NUMBER: 40-1302		DRAWING NUMBER: 0214-59
DATE: 29/09/2023	DRAWN: STEVEN	CHECKED: PALESA
REFERENCE CODE: FJM-2614/L		SCALE: 1 : 900

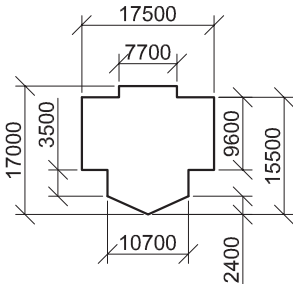
QUESTION 1: ANALYTICAL (CIVIL)

Given:
The site plan of an existing resort with a proposed new lodge and deck, as well as a new carport, a title panel and a table of questions. The drawing is not presented to the indicated scale.

Instructions:
Complete the table below by neatly answering the questions, which refer to the accompanying drawing, title panel and civil content. **[30]**

QUESTIONS		ANSWERS		
1	What does the number 0214-59 refer to?	1		
2	Who is the client?	1		
3	Who printed the drawing?	1		
4	In which town is the architectural firm situated?	1		
5	What was the second revision?	1		
6	How high is corner D above sea level in metres?	1		
7	Name the feature at 1.	1		
8	Name the natural feature at 2.	1		
9	What is the height of the feature at 3 in millimetres?	1		
10	What must happen to the features at 4?	1		
11	Name the symbol at 5.	1		
12	What is the finish on the new driveway?	1		
13	What does the abbreviation <i>B/C</i> on floor plans stand for?	1		
14	In what colour must new drain pipes be indicated on drainage installation drawings?	1		
15	What is the shortest distance from the proposed new carport to the boundary line with STAND 3112 in metres?	2		
16	With reference to the north point, in what direction does the sewerage flow in the municipal sewerage line?	2		
17	What is the proposed total number of guests that would be accommodated at the resort?	2		
18	In the space below (ANSWER 18), determine the total perimeter of the area ABCF in metres.	3		
19	In the space below (ANSWER 19), determine the total area of the new lodge and deck in square metres.	3		
20	In the space in the title panel (ANSWER 20), draw, in neat freehand, the <i>SANS 10143</i> graphical symbol for: (a) the front view of a BIDET, and (b) an electrical REGULATING SWITCH/DIMMER.	4		
TOTAL		30		

ANSWER 18
Show ALL calculations.



ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER

EXAMINATION NUMBER

2



QUESTION 2: SOLID GEOMETRY

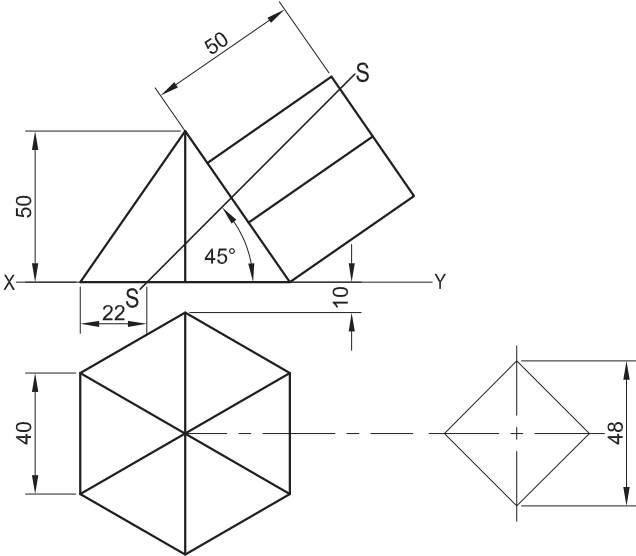
- Given:**
- The front view of a right regular hexagonal pyramid and a right square prism
 - The top view of the right regular hexagonal pyramid, with the axes and an auxiliary view for the right square prism
 - Cutting plane S-S

- Specifications:**
- The lower base of the right square prism rests against the right side triangular face of the hexagonal pyramid
 - Both solids are cut by cutting plane S-S

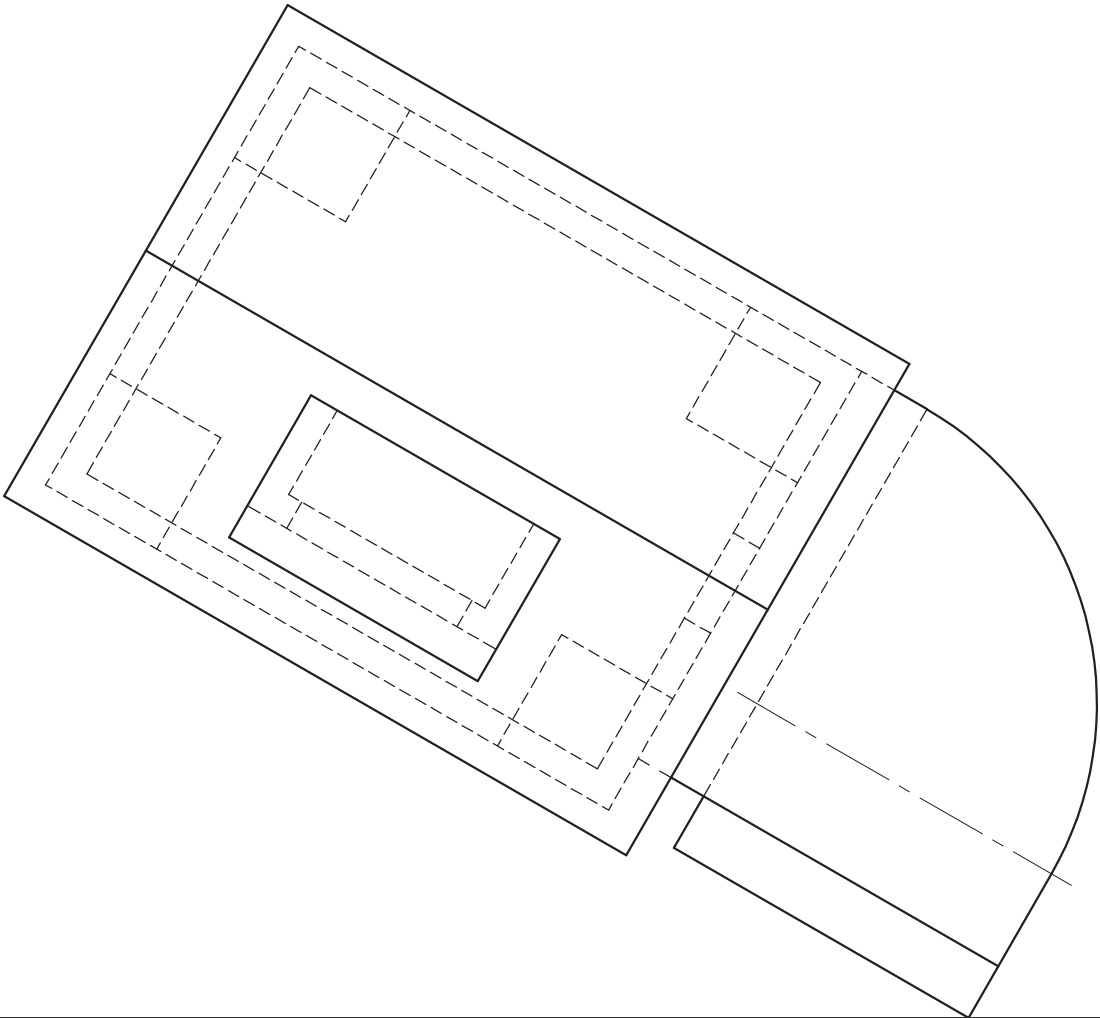
Instructions:
Draw, to scale 1 : 1, the following views showing both solids:
2.1 The given front view
2.2 A sectional top view
2.3 A sectional left view

- Planning is essential.
- Show ALL construction.
- Show ALL hidden detail.

[38]



ASSESSMENT CRITERIA				
1	FRONT VIEW	7 ¹ / ₂		
2	SECTIONAL TOP VIEW	16 ¹ / ₂		
3	SECTIONAL LEFT VIEW	14		
PENALTIES (-)				
TOTAL		38		
EXAMINATION NUMBER				
EXAMINATION NUMBER				3



QUESTION 3: PERSPECTIVE

Given:
Three views of an A-frame house on blocks and the information needed to draw a two-point perspective drawing
PP – Picture plane
HL – Horizon line
GL – Ground line
SP – Station point

Instructions:
Complete the perspective drawing.

- Align the drawing sheet with the ground line (GL).
- Determine and label the vanishing points.
- Show ALL construction.
- Show depth at the door and windows.
- NO internal or hidden detail is required.

[40]

ASSESSMENT CRITERIA					
1	CONSTRUCTION	6			
2	FLOOR + STEPS	12			
3	WINDOWS + DOOR	9 ¹ / ₂			
4	ROOF	7			
5	ARC	5 ¹ / ₂			
PENALTIES (-)					
TOTAL		40			

PP

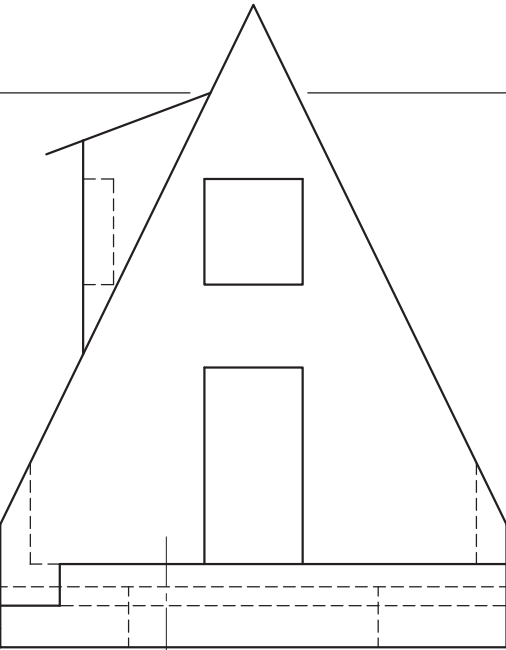
HL

GL

SP

HL

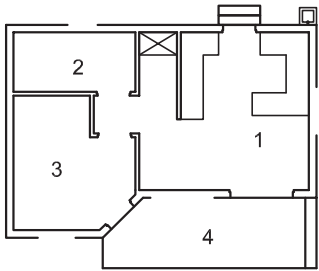
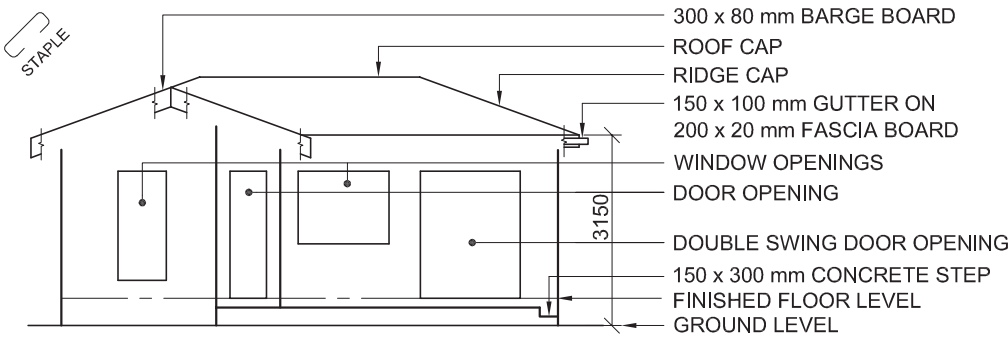
GL



EXAMINATION NUMBER

EXAMINATION NUMBER

4



- FLOOR FINISHES**
- | | |
|---------------|----------|
| 1. OPEN AREA: | TILE |
| 2. BATHROOM: | TILE |
| 3. BEDROOM: | CARPET |
| 4. PATIO: | CONCRETE |

ROOM DESIGNATIONS

FEATURES

D1 DOUBLE SWING DOOR
D2 DOOR
W1 WINDOW
W2 WINDOW
W3 WINDOW

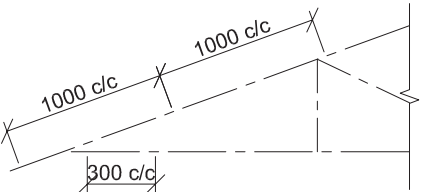
FIXTURES

S SINK
SH SHOWER
WC TOILET
WB WASHBASIN

ELECTRICAL FITTINGS

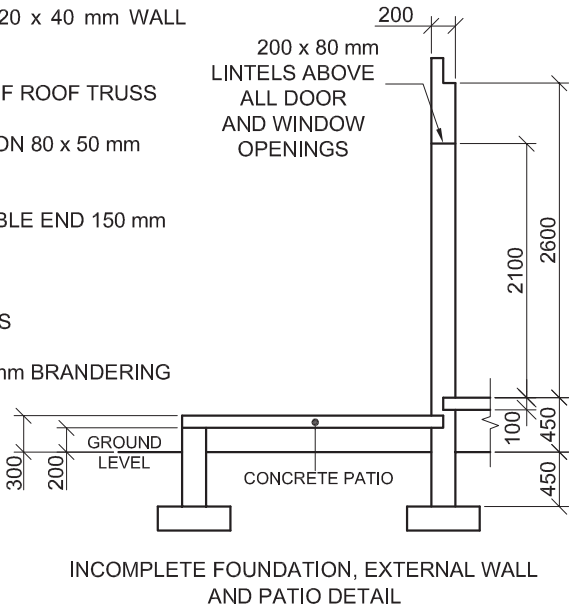
1. ONE-WAY SWITCH - SINGLE-POLE
2. ONE-WAY SWITCH - DOUBLE-POLE
3. FLUORESCENT LIGHT 2 x 40 W
4. CEILING LIGHT
5. SWITCHED SOCKET OUTLET
6. DISTRIBUTION BOARD

NOTE:
THE ARROW SHOWS THE LIGHT CONNECTION TO THE SWITCH.



INCOMPLETE SCHEMATIC DIAGRAM OF A ROOF TRUSS AT CUTTING PLANE A-A

- ROOF NOTES:**
20° ROOF PITCH
- 120 x 40 mm ROOF TRUSSES ON 120 x 40 mm WALL PLATES
- 350 mm ROOF OVERHANG TO END OF ROOF TRUSS
- 40 mm CORRUGATED ROOF SHEET ON 80 x 50 mm PURLINS @ 1000 mm c/c
- 300 x 80 mm BARGE BOARDS ON GABLE END 150 mm PAST FASCIA BOARDS
- 200 x 20 mm FASCIA BOARDS WITH 150 x 100 mm GUTTERS ON ALL SIDES
- 10 mm CEILING BOARDS ON 40 x 40 mm BRANDING STRIPS @ 300 mm c/c



DOOR AND WINDOW SCHEDULE

TO FIT	TO FIT	TO FIT	TO FIT
DOUBLE SWING DOOR AND FRAME WITH TWO DOORS (D1)	SINGLE DOOR AND FRAME (D2)	WINDOW (W1)	WINDOW (W3)

WINDOW NOTES:

- A = OPENING SIDE
- B = FIXED PANEL
- ALL FRAMES = 50 mm THICK
- 200 x 20 mm FIBRE CEMENT SILL UNDER ALL WINDOWS

ROOF COMPONENTS		ELECTRICAL SYMBOLS	
	ROOF CAP AND RIDGE CAP		
	300 x 80 mm BARGE BOARD		
	200 x 20 mm FASCIA BOARD		
	150 x 100 mm GUTTER		
	80 x 50 mm PURLINS		

FIXTURES

TOILET (WC)	SINK (S)	SHOWER (SH)	WASHBASIN (WB)

QUESTION 4: CIVIL DRAWING

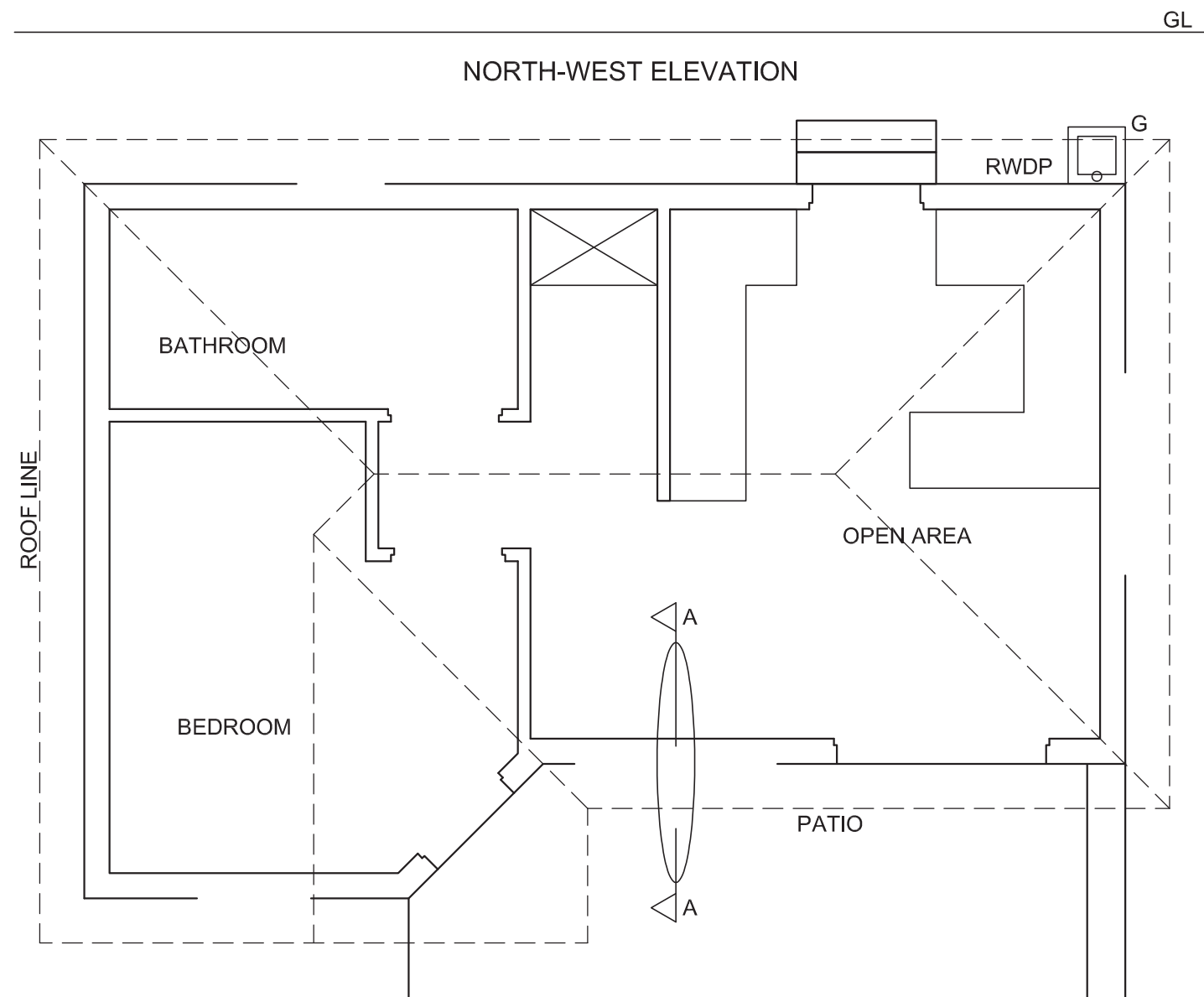
- Given:**
- The incomplete north-west elevation of a **new house**, showing the walls, the window and door openings, the patio and step, roof and labels
 - The incomplete floor plan showing the walls, roof line, patio, step, positions of the doors and windows, fixtures and electrical layout
 - An incomplete schematic diagram of a roof truss at cutting plane A-A and roof notes
 - The incomplete foundation, external wall and patio detail
 - Room designations and floor finishes
 - A door and window schedule
 - A table of roof components
 - A table of electrical symbols
 - A table of fixtures
 - The incomplete floor plan and position of the ground level of the **new house**, drawn to scale 1 : 50, and the incomplete foundation and break lines for the detailed section, drawn to scale 1 : 20, on page 6

- Instructions:**
Answer this question on page 6.
- 4.1 Using the given incomplete floor plan and ground level, draw, to scale 1 : 50, the following views of the **new house**:
- 4.1.1 **THE COMPLETE FLOOR PLAN**
Add the following features to the drawing:
- ALL doors and windows
 - ALL fixtures as indicated by the abbreviations
 - ALL electrical fittings as indicated by the numbers
 - ALL hatching detail
- 4.1.2 **THE COMPLETE NORTH-WEST ELEVATION**
Show the following features on the drawing:
- The walls, windows, doors (with all three doors in the closed position), patio and step detail
 - The roof detail including fascia board, barge boards and gutter
 - The finished floor level
- 4.2 Using the incomplete foundation and break lines on page 6, draw, to scale 1 : 20, a **DETAILED SECTION** on cutting plane A-A of the area in the ellipse shown on the incomplete floor plan.
- Show the following features on the drawing:**
- The complete foundation, external wall, slab, patio and window detail
 - The roof detail including the fascia board and gutter
 - The door and frame, roof, fascia board and gutter detail, to the left (north-east) of cutting plane A-A
 - ALL hatching detail. ONLY the substructure hatching may be drawn in neat freehand.

- Label the following:**
- The floor finishes
 - Ground level, finished floor level and damp-proof course (use the correct abbreviations and show them on ALL relevant views)
- NOTE:**
ALL drawings must comply with the **guidelines** and **graphical symbols** as contained in **SANS 10143**. [92]

MARK ALLOCATION FOR SECTION OF ROOF			FOR OFFICIAL USE ONLY		
A			INCORRECT SCALE(S) USED		
B			NON-ALIGNMENT OF VIEWS		
C			VIEW(S) ROTATED		
D			SECTION VIEWED INCORRECTLY		
E			INCORRECT LETTERING		
F					
G					
H					
J					
TOTAL			TOTAL		

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	DOORS + WINDOWS	14			
2	FIXTURES	7			
3	ELECTRICAL	7 $\frac{1}{2}$			
4	LABELS	2			
5	HATCHING	3			
SUBTOTAL		33 $\frac{1}{2}$			
NORTH-WEST ELEVATION					
1	ROOF + RWDP	7 $\frac{1}{2}$			
2	WALLS + STEPS	4			
3	DOORS + WINDOWS	11 $\frac{1}{2}$			
4	LABELS	$\frac{1}{2}$			
SUBTOTAL		23 $\frac{1}{2}$			
DETAILED SECTION					
1	ROOF DETAIL	13			
2	SLAB + WALL	7			
3	HATCHING	6 $\frac{1}{2}$			
4	WINDOW + DOOR	7			
5	LABELS	1 $\frac{1}{2}$			
SUBTOTAL		35			
TOTAL		92			
PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					6



SECTION A-A
SCALE 1 : 20

FLOOR PLAN
SCALE 1 : 50