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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.

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Please turn over

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	CHECKED BY
100	

COMPLETE THE FOLLOWING:

CENTRE NUMBER

CENTRE NUMBER

EXAMINATION NUMBER

EXAMINATION NUMBER

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

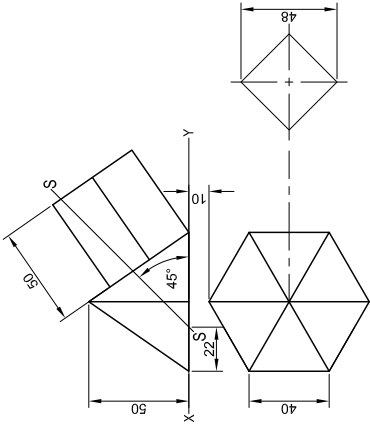
Instructions:

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:

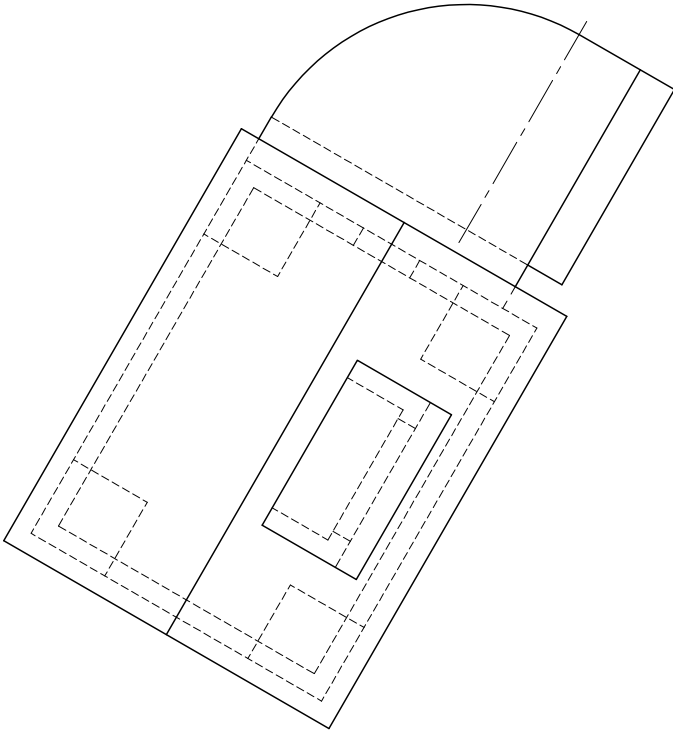
Three views of an A-frame house on blocks and the information needed to draw a two-point perspective drawing
PP – Picture plane
HL – Horizon line
GL – Ground line
SP – Station point

Instructions:

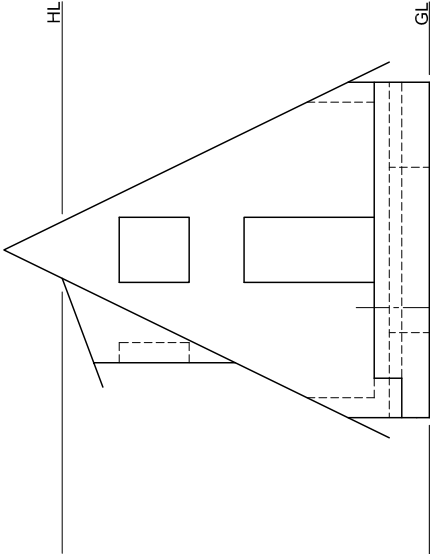
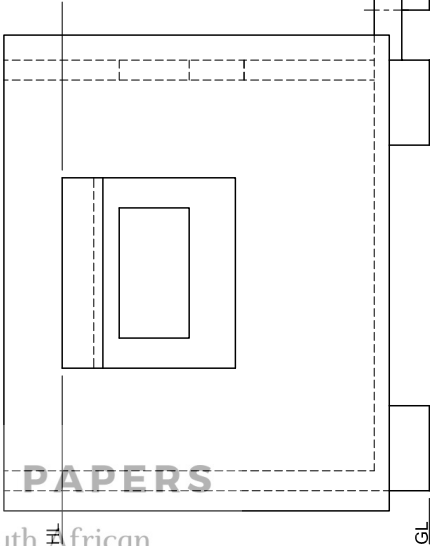
Complete the perspective drawing.

- 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 ½		
4	ROOF	7		
5	ARC	5 ½		
PENALTIES (-)				
TOTAL		40		



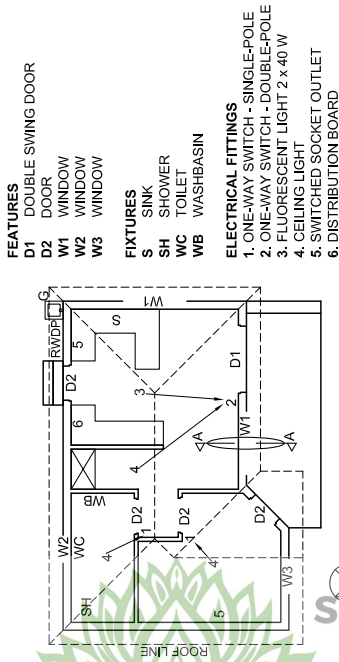
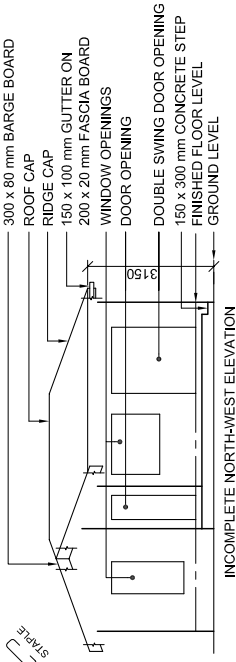
SP

EXAMINATION NUMBER

EXAMINATION NUMBER

4

Please turn over

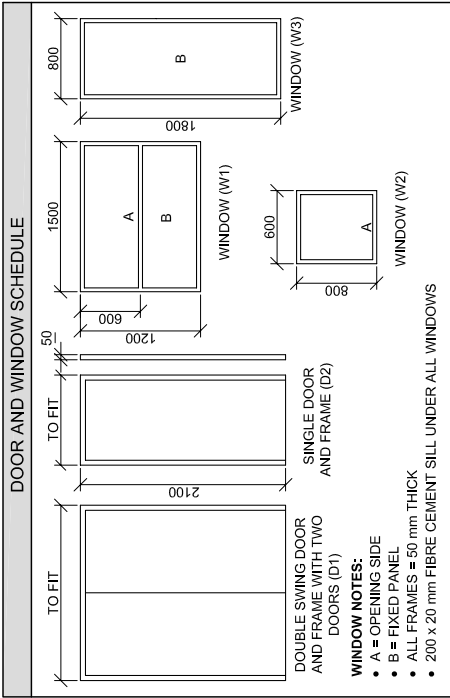
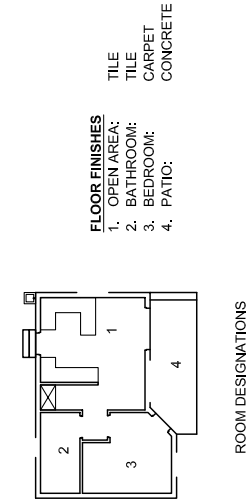


NOTE:
THE ARROW SHOWS THE LIGHT
CONNECTION TO THE SWITCH.

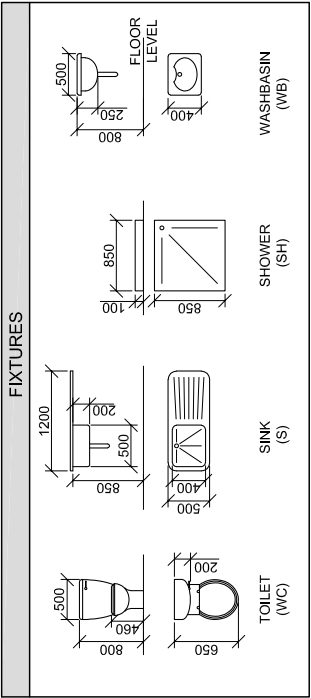
INCOMPLETE SCHEMATIC DIAGRAM OF
A ROOF TRUSS AT CUTTING PLANE A-A

- 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

INCOMPLETE FOUNDATION, EXTERNAL WALL
AND PATIO DETAIL



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		



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]

Engineering Graphics and Design/P1

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DBE/November 2024

SECTION A-A

SCALE 1 : 20

NORTH-WEST ELEVATION

GL

GL

RWDP

G

BATHROOM

OPEN AREA

PATIO

BEDROOM

ROOF LINE

FLOOR PLAN

SCALE 1 : 50

MARK ALLOCATION FOR SECTION OF ROOF

A

B

C

D

E

F

G

H

J

TOTAL

FOR OFFICIAL USE ONLY

INCORRECT SCALE(S) USED

NON-ALIGNMENT OF VIEWS

VIEW(S) ROTATED

SECTION VIEWED INCORRECTLY

INCORRECT LETTERING

TOTAL

ASSESSMENT CRITERIA

FLOOR PLAN

POSSIBLE

OBTAINED

SIGN

MODERATED

1

DOORS + WINDOWS

14

2

FIXTURES

7

3

ELECTRICAL

7 1/2

4

LABELS

2

5

HATCHING

3

SUBTOTAL

33 1/2

NORTH-WEST ELEVATION

1

ROOF + RWDP

7 1/2

2

WALLS + STEPS

4

3

DOORS + WINDOWS

11 1/2

4

LABELS

1 1/2

SUBTOTAL

23 1/2

DETAILED SECTION

1

ROOF DETAIL

13

2

SLAB + WALL

7

3

HATCHING

6 1/2

4

WINDOW + DOOR

7

5

LABELS

1 1/2

SUBTOTAL

35

TOTAL

92

PENALTIES (+)

GRAND TOTAL

EXAMINATION NUMBER

EXAMINATION NUMBER

6

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