



NATIONAL SENIOR CERTIFICATE EXAMINATION

2018

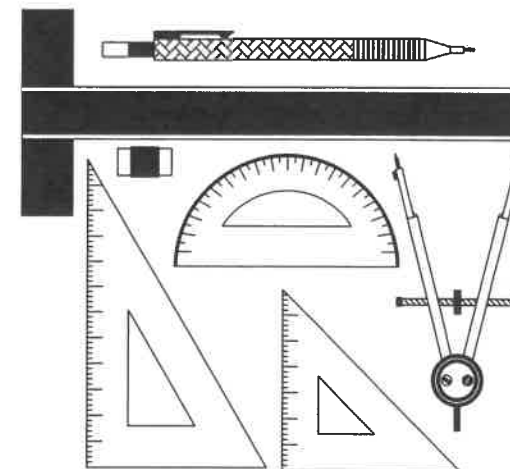
ENGINEERING GRAPHICS AND DESIGN

PAPER 1

MARKS: 200
TIME: 3 HOURS

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of **6 pages** including the cover page and **4 questions**.
2. **All** questions must be answered.
3. Unless specified otherwise, all questions are in **First-angle Orthographic Projection**.
4. Unless specified otherwise, all questions are to be completed to a **scale of 1:1**.
5. **All** answer sheets must be re-stapled in numerical order, even questions that have not been answered.
6. **All construction work** must be shown.
7. Print your **examination number** neatly on each page.
8. Use only the **answer sheets** provided.
9. Your drawings should reflect **neatness** and **accuracy**.
10. All dimensions or detail not given may be **assumed in good proportion**.
11. Your drawings should comply with SANS 10143.



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QUESTION	SECTION	MARK	MODERATED	MAXIMUM	CODE
1	CIVIL ANALYTICAL			20	
2	INTERPENETRATION & DEVELOPMENT			40	
3	TWO-POINT PERSPECTIVE			40	
4	CIVIL DRAWING			100	
SYMBOL	TOTAL			200	
				100	

FINAL CONVERTED MARK

100

CHECKED BY

EXAMINATION NUMBER

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CIVIL
ANALYTICAL

1.1 What is the scale of the drawing?		1
1.2 How close may any building be built to the property boundary?		1
1.3 What is the ERF number of the property to the NORTH?		1
1.4 How many trees are currently on this property?		1
1.5 What surface finish is used for the driveway?		1
1.6 What is the feature at 1 called?		1
1.7 What does the broken line at feature 2 imply?		1
1.8 What is the feature at 3 called?		1
1.9 What is the feature at 4 called? (No abbreviations)		1
1.10 What is the feature at 5 called?		1
1.11 What is the feature at 6 called?		1
1.12 What is the feature at 7 called?		1
1.13 When walking down the steps, which direction would you be facing?		1
1.14 Choose either A, B or C based on the following question: If a car were driven out of the gate and turned left onto 7th Avenue and drove along 7th Avenue, would it be driving A. downhill? B. uphill? C. on level ground?		1

	2
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PLAN VIEW	ELEVATION VIEW

2

1 x double pole light switch placed on the EASTERN wall	2
1 x switched socket outlet placed on the SOUTHERN wall	

[illegible]

PLEASE TURN OVER



QUESTION 2

INTERPENETRATION
& DEVELOPMENT

The figure below shows the COMPLETE Front View and the INCOMPLETE Top View of a **RIGHT REGULAR SQUARE DUCT** penetrated perpendicularly by a **CIRCULAR PIPE** and drawn in First-angle Orthographic Projection. The Auxiliary Views of the circular pipe are also shown in the Front and Top Views.

Draw the following:

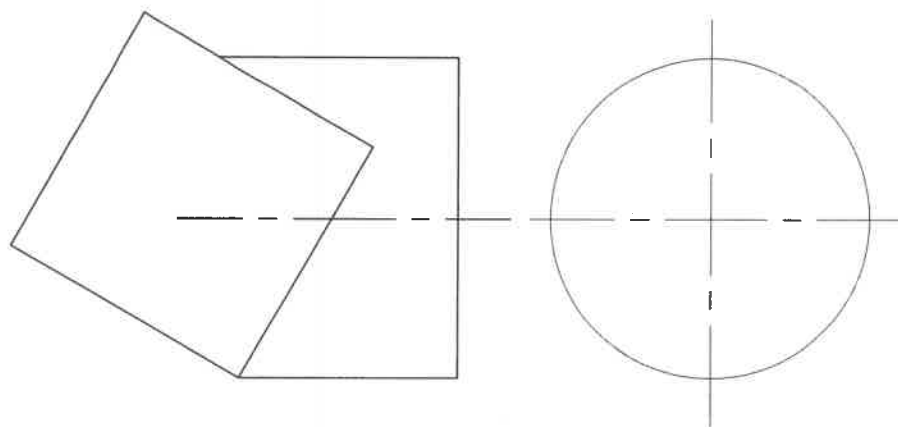
- 2.1 the complete Top View clearly showing the curve of interpenetration. Show all hidden detail.
- 2.2 the development of the two surfaces of the square duct that are being penetrated, clearly showing the curve of interpenetration. Show all construction.

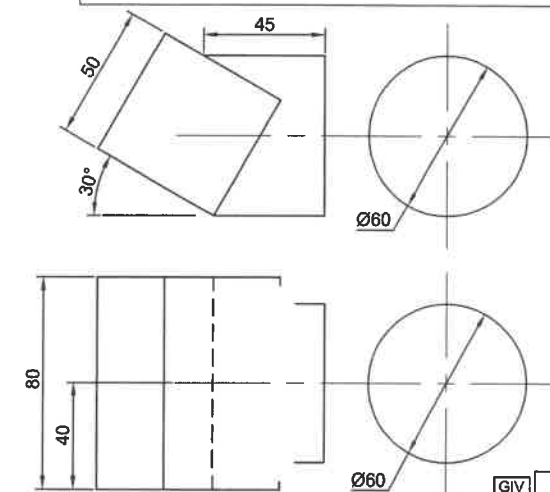
The complete Front View and an Auxiliary View as well as the Top View of the centre line of the circular pipe have already been drawn for you.

ASSESSMENT CRITERIA

You will be assessed on your ability to do the following:

- | | |
|------------------------------------|----|
| • draw and complete the Top View | 23 |
| • show necessary construction | 2 |
| • develop and draw the square duct | 15 |



GIV
4TV
19CON
2DEV
15

40 MARKS

EXAMINATION NUMBER

ANSWER SHEET 2

QUESTION 3

**TWO-POINT
PERSPECTIVE**

The figure shows the three views of the inside of a kitchen with built-in cupboards. Some walls have been removed to see inside the kitchen.
Draw a neat two-point perspective view of the kitchen.

PP - Picture Plane
HL - Horizon Line
GL - Ground Line
SP - Station Point

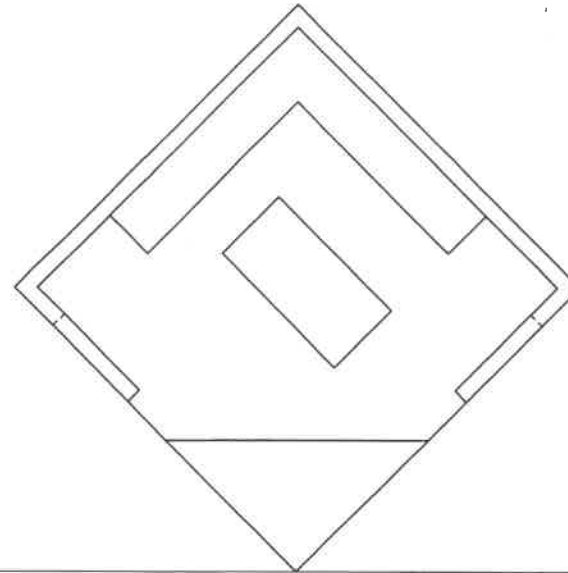
Do not move the SP. It is positioned correctly.

Neatly label the vanishing points RVP and LVP.
NO HIDDEN DETAIL IS REQUIRED.

ASSESSMENT CRITERIA

You will be assessed on your ability to do the following:

- determine and label the vanishing points 2
- determine the two-point perspective view 38



PP

PP

HL

HL

GL

GL

SP

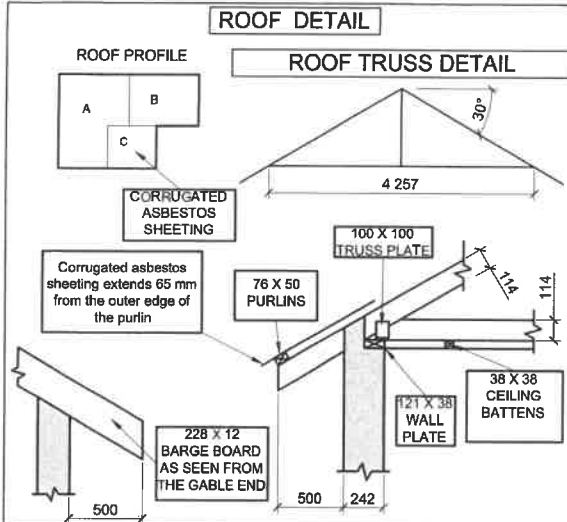
PTS	26
Con	4
Arc	8
VPS	2

40 MARKS

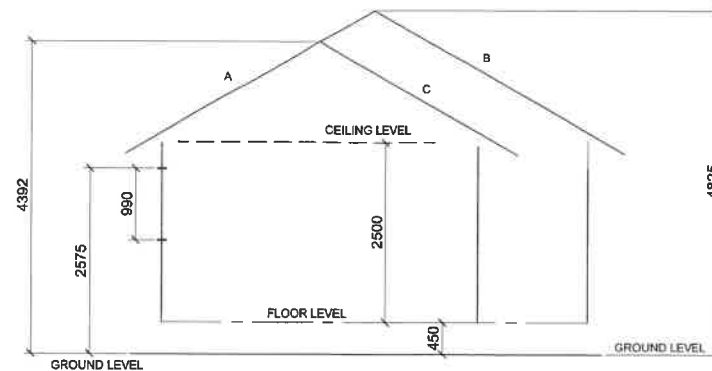
EXAMINATION NUMBER

ANSWER SHEET 3

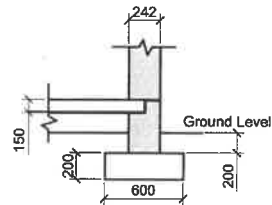
QUESTION 4

CIVIL
DRAWING

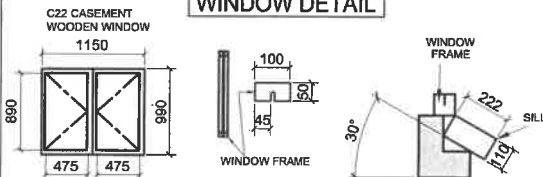
SCHEMATIC SOUTH ELEVATION



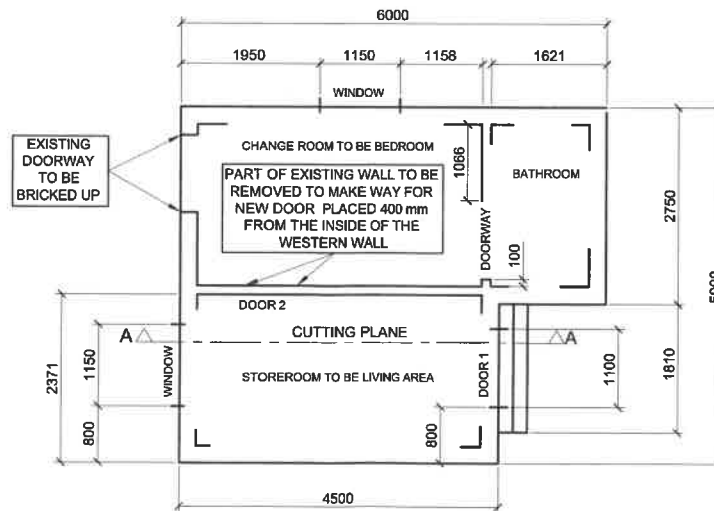
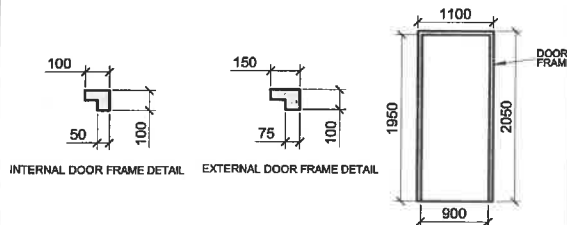
INCOMPLETE FOUNDATION DETAIL



WINDOW DETAIL



DOOR FRAME DETAIL



SCHEMATIC FLOOR PLAN

NOTES:

DOOR 1 opens internally.

DOOR 2 has a width of 1100 mm and must open into the new bedroom.

Floor tiles should be used for the entire floor area.

Each concrete step has a 150 mm rise and a 200 mm step.

With reference to the roof: The A, B and C refer to the roof profile and relate to the various roof areas as indicated in the schematic elevation

Answer this question on ANSWER SHEET 4 (p.6).
All drawings must comply with SANS 10143.

The following is given:

- An incomplete schematic floor plan of a tiled **BUILDING** to be converted into a one-bedroom **BACHELOR PAD** with
 - ▶ window and door positions
 - ▶ perimeter dimensions
- An incomplete schematic elevation with
 - ▶ door and window positions, ground and floor levels
- Door and door frame detail
- Incomplete foundation detail
- Roof detail
- Window, window frame and window sill detail

Draw the following on answer sheet 4 using a scale of 1:50 :

- The **complete FLOOR PLAN**
- The **SECTIONAL SOUTH ELEVATION** on cutting plane A-A.

FLOOR PLAN INSTRUCTIONS

- The following alterations must be made:
 - ▶ Brick up the existing external door on the Western wall
 - ▶ Remove part of the existing internal wall as indicated and place a door 400 mm from the western wall
- Draw and hatch all walls
- Insert all window details
- Insert the door detail of DOOR 1 and DOOR 2 only
- Draw the step and indicate the direction
- Indicate the room designation for all three new rooms
- Label the floor plan and the scale
- Draw and label the cutting plane

SECTIONAL SOUTH ELEVATION INSTRUCTIONS

- Draw the complete SOUTH ELEVATION showing the section as per the indicated cutting plane and the remaining outside elevation
- Complete the foundation details
- Insert all floor slab details
 - ▶ use 300 mm compacted hardcore filling
- Label the ground level and damp-proof course
- Draw in the sectional window with the same frame detail as the C22
 - ▶ use ONE 242 x 75 mm concrete lintel above the window
 - ▶ use 222 x 110 mm quarry tile windowsill
 - ▶ show the window frame detail
- Draw in the sectioned door frame detail
 - ▶ use ONE 242 x 75 mm concrete lintel above the door
 - ▶ show the door frame detail
- Roof details
 - ▶ draw the King Post roof truss using 114 x 38 mm rafters
 - ▶ use 100 x 100 mm truss plates
 - ▶ use FOUR 76 x 50 mm purlins spaced appropriately
 - ▶ use TWO 121 x 38 mm wall plates
 - ▶ show any TWO 38 x 38 mm ceiling battens - place appropriately
 - ▶ use corrugated asbestos sheeting for the roof and a 30° pitch
 - ▶ use 9 mm gypsum ceiling boards
- Draw the concrete step
- Show all hatching detail
- Label the sectional SOUTH ELEVATION

EXAMINATION NUMBER

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QUESTION 4

CIVIL
DRAWING

Assessment Criteria

Sectional Elevation

1	Ceiling Battens	2	
2	Wall Plates	2	
3	Ceiling Board	1	
4	Truss Plates	4	
5	Roof Truss	5	
6	Purlins	4	
7	Roof	1	
8	Walls	6	
9	Sectioned Window	5	
10	Floor & Foundation	6	
11	DPC	3	
12	Hatching	13	
13	Sectioned Door	4	
14	New Internal Door	3	
15	Step	2	
16	Barge Board	3	
17	Labels	2	

Subtotal	66	
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Floor Plan

18	Walls	8	
19	Hatching	5	
20	Windows	4	
21	Doors	6	
22	Step	4	
23	Labels	5	
24	Cutting Plane	2	

Subtotal	34	
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TOTAL	100	
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100 MARKS

EXAMINATION NUMBER

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ANSWER SHEET 4