NATIONAL SENIOR CERTIFICATE EXAMINATION

2016

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 are not attempted/blank.
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.

FOR OFFICIAL USE ONLY

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>SECTION</th>
<th>MARK</th>
<th>MODERATED</th>
<th>MAXIMUM</th>
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<td>2</td>
<td>INTERPENETRATION &amp; DEVELOPMENT</td>
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<td>3</td>
<td>TWO-POINT PERSPECTIVE</td>
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</table>

FINAL CONVERTED MARK CHECKED BY

100

EXAMINATION NUMBER
STUDY THE ADJACENT DRAWING AND ANSWER THE QUESTIONS THAT FOLLOW:

1.1 What type of civil drawing is shown?

1.2 How many bathrooms does this dwelling have?

1.3 What is the diameter of the ventilation pipe?

1.4 Who is the owner of the property ERF 57?

1.5 In which city is the architect's office found?

1.6 In which elevation would you see the main entrance door?

1.7 What is the feature at 1 called?

1.8 What is the feature at 2 called?

1.9 What is the room designation indicated by the number 3?

1.10 What does the abbreviation "FP", as indicated at feature 4, stand for?

1.11 Suggest what the feature indicated by arrow 5 might be.

1.12 What is the feature at 6 called?

1.13 How many ND17 windows are shown on this drawing?

1.14 How many 40 watt fluorescent tubes are used in the kitchen?

1.15 How many rooms have a tile floor finish?

1.16 How many external doors are shown on this drawing?

1.17 What type of brick must be used for the exterior walls?

1.18 What is the area of the wooden deck in square metres?

1.19 In the space below, draw, in NEAT freehand, the PLAN VIEW and ELEVATION VIEW of the SABS convention for a wall-mounted urinal.

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NOTES:

Roof covering is to be clay tiles.
Basement bedroom sliding door must be aluminium.
Exterior walls to be face brick.
Interior walls to be standard clay brick.
The figure below shows the INCOMPLETE Front View and the INCOMPLETE Top View of a CIRCULAR PIPE penetrated by an EQUILATERAL TRIANGULAR DUCT drawn in First-angle Orthographic Projection. The auxiliary view of the triangular duct is also shown in the Top View.

Draw the following:
2.1 the complete FRONT view clearly showing the curve of interpenetration. Show all hidden detail.
2.2 the complete TOP view.
2.3 the development of the triangular duct.

Show all construction.

ASSESSMENT CRITERIA
You will be assessed on your ability to do the following:
- draw the given views
- complete the front view
- complete the top view
- show necessary construction
- develop and label the triangular duct

40 MARKS
The figure shows the three views of an apartment. Draw a neat two-point perspective view of the dwelling.

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

Show the wall thickness where applicable. 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 marks
- determine the two-point perspective view 38 marks
Answer this question on ANSWER SHEET 4. Use a scale of 1:50.

The following is given:
- An incomplete schematic floor plan of a tiled GARDEN FLAT with:
  - window and door positions
  - perimeter dimensions
- An incomplete schematic elevation with:
  - door and window positions, ground and floor levels
- Complete foundation detail
- Roof and roof truss detail
- Plumbing fixtures legend
- Window, window frame, window sill and door frame detail

Draw the following:
1) The complete floor plan
2) The SOUTH elevation showing the section as indicated by the cutting plane A-A as well as the remaining outside elevation that is not cut.

**FLOOR PLAN INSTRUCTIONS**
- Insert all window details and the door detail of the external door only
- Draw the gully one brick course wide
- Label the floor plan, scale, room designation and floor finish
- Insert the following electrical detail:
  - A 40 watt fluorescent light in the middle of the room
  - One single pole light switch for the fluorescent light
  - One switched socket outlet on the northern wall
- Insert the SANS plumbing symbols in the bathroom for the following:
  - A water closet (toilet), shower and a wash basin as indicated
  - Piping showing the basin and shower linking to the gully
- Draw the built-in cupboard
- Draw an external sewer line linking the given manhole to the toilet and gully, indicate a suitable rodding eye in your sewer configuration.
- Draw and label the cutting plane A-A

**SECTIONAL SOUTH ELEVATION INSTRUCTIONS**
- Draw the complete south elevation showing the section as per the indicated cutting plane and the remaining outside elevation.
- Show the outside C22 window
- Show the external opening where the door frame would be positioned
- Show some detail for the corrugated asbestos roof sheeting
- Complete the foundation details
- Draw all floor slab details:
  - use 10 mm screed and 150 mm compacted hardcore filling
  - Label the ground level and damp-proof course
- Draw in the sectional C22 window:
  - use ONE, 242 x 75 concrete lintel above the window
  - use 222 x 110 quarry tile window sill
  - show the window frame detail and label the damp proof course
- Roof details:
  - Use the roof truss using 114 x 38 rafters and 100 x 75 plates
  - Use FOUR, 76 x 50 purlins spaced at 2000 centres
  - Use TWO, 121 x 38 wall plates
  - Use TWO, 38 x 38 battens spaced at 756 centres
  - Use 229 x 58 fascia boards
  - Use 9 mm gypsum ceiling boards
- Show all hatch detailing and label the sectional South Elevation

**NOTES:**
All windows are casement wooden frame windows.
### Assessment Criteria

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**Subtotal** 61

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**Subtotal** 39

**TOTAL** 100

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**100 MARKS**

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**EXAMINATION NUMBER**

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**ANSWER SHEET 4**