NATIONAL SENIOR CERTIFICATE EXAMINATION
2012

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 drawing sheets provided.
9. Your drawings should reflect neatness and accuracy.
10. All dimensions or detail not given may be assumed in good proportion.

FOR OFFICIAL USE ONLY

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>SECTION</th>
<th>MARK</th>
<th>MODERATED</th>
<th>MAXIMUM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CIVIL ANALYTICAL</td>
<td></td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>2</td>
<td>DEVELOPMENT</td>
<td></td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>3</td>
<td>TWO POINT PERSPECTIVE</td>
<td></td>
<td></td>
<td>36</td>
</tr>
<tr>
<td>4</td>
<td>CIVIL DRAWING</td>
<td></td>
<td></td>
<td>103</td>
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</tbody>
</table>

SYMBOL

| TOTAL | 200 |

FINAL CONVERTED MARK

CHECKED BY

100
C G and Associates Architects
"we draw the future"

STUDY THE ADJACENT DRAWING AND ANSWER THE QUESTIONS THAT FOLLOW:

1.1 What type of civil drawing is shown by VIEW A?

1.2 What elevation is VIEW C?

1.3 What would be the room designation of ROOM 3?

1.4 How many bathrooms does this house have?

1.5 How many Inspection Eyes are shown in VIEW B?

1.6 What does the abbreviation RE stand for?

1.7 What floor finish would be appropriate for ROOM 4?

1.8 What type of sewer system serves this dwelling?

1.9 What is the feature at 1 called?

1.10 What is the feature at 2 called?

1.11 What is the feature at 3 called?

1.12 What is the feature at 4 called?

1.13 What is the feature at 5 called?

1.14 What is the feature at 6 called?

1.15 How many panes of glass do each of the ND64 windows have?

1.16 With reference to the drawing of the load-bearing wall and foundation, indicate which feature is represented by the corresponding letter.

1.17 What type of finish will be used for the outside walls of this house?

1.18 In the space below, draw, in NEAT freehand, the PLAN VIEW and ELEVATION VIEW of the SABS convention for a shower.

PLAN VIEW

ELEVATION VIEW

1.19 Insert the following electrical detail into ROOM 3 and the adjacent bathroom shown in VIEW A (Use the correct SABS conventions):

- A THREE, 40 watt fluorescent tube light fitting in the middle of ROOM 3
- A single wall mounted light outside the external door
- A single light in the center of the MES
- One three pole switch situated appropriately for the three lights
- A switched socket outlet on the internal wall in ROOM 3

26 MARKS
The figure shows the Front View, Top View and Left View of an AIR CONDITIONING VENT in First Angle orthographic projection.

Draw the following:
2.1 Copy the given FRONT view and TOP view only, positioning them appropriately on the given centre lines
2.2 Draw the development of the SQUARE DUCTING (PART A)
2.3 Using triangulation, develop the transition piece (PART B)
2.4 Show all construction

ASSESSMENT CRITERIA
You will be assessed on your ability to do the following:
- redraw the given front and top views only 4
- develop the square duct 7
- find the necessary true lengths 4
- develop the transition piece 20

35 MARKS
The figure shows the three views of a dwelling with a double garage. Draw a neat two-point perspective view of the dwelling and garage.

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

Neatly label the vanishing points RVP and LVP.

SHOW NO HIDDEN DETAIL

**ASSESSMENT CRITERIA**

You will be assessed on your ability to do the following:
- determine and label the vanishing points [2]
- project from the front or side view [1]
- project to the station and vanishing points [3]
- determine the two-point perspective view [30]

TOTAL [46]
SCHEMATIC ELEVATION

SCHEMATIC FLOOR PLAN

In this question, you are required to:

1. Complete the floor plan.
2. Complete the sectional elevation, including the rest of the elevation that is not sectioned.

**Floor Plan Instructions**
- Hatch all external and internal walls.
- Insert all window and external door details and label the cutting plane (show all door detail at D1 and D2 only).
- Label the floor plan and print the scale.
- Insert the following plumbing detail according to the legend given:
  - A water closet (toilet) and a wash basin in the toilet.
  - A single steel sink in the kitchenette.

**Sectional Elevation Instructions**
- Complete the foundation details.
- Insert all floor slab details.
  - Use 10 mm screws.
  - Use 150 mm compacted hardcore filling.
- Label the ground level and damp proof course.
- Draw in the sectional window in the space indicated.
  - Use ONE, 242 x 75 concrete lintel above the window.
  - Use 150 x 50 quarry tile window sill.
  - Show the window frame detail and label the damp proof course.
- Complete the roof details.
  - Draw the roof truss.
  - Use 114 x 38 rafters and 100 x 100 truss plates for the truss.
  - Use SIX, 76 x 38 purlins spaced at 1521 centres.
  - Use TWO, 121 x 38 wall plates.
  - Use THREE, 38 x 38 battens spaced at 1004 centres.
  - Use asbestos sheeting for the roof and a 30° pitch.
  - Use 9 mm Gypsum ceiling boards.
- Complete all hatching detail and label the sectional elevation.
- Draw the rest of the elevation that is not sectioned showing suitable door panels, of your choice, for the closed door D1.
- Do not show plumbing on this elevation.
## Assessment Criteria

### Sectional Elevation

<table>
<thead>
<tr>
<th>Item</th>
<th>Marks</th>
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</thead>
<tbody>
<tr>
<td>1 Ceiling Battens</td>
<td>3</td>
</tr>
<tr>
<td>2 Wall Plates</td>
<td>2</td>
</tr>
<tr>
<td>3 Ceiling Board</td>
<td>1</td>
</tr>
<tr>
<td>4 Truss Plates</td>
<td>4</td>
</tr>
<tr>
<td>5 Roof Truss</td>
<td>5</td>
</tr>
<tr>
<td>6 Purlins</td>
<td>6</td>
</tr>
<tr>
<td>7 Roof</td>
<td>1</td>
</tr>
<tr>
<td>8 Walls</td>
<td>5</td>
</tr>
<tr>
<td>9 Window</td>
<td>6</td>
</tr>
<tr>
<td>10 Floor &amp; Foundation</td>
<td>6</td>
</tr>
<tr>
<td>11 DPC</td>
<td>2</td>
</tr>
<tr>
<td>12 Labels</td>
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</tr>
<tr>
<td>13 Hatching</td>
<td>11</td>
</tr>
<tr>
<td>14 External Door</td>
<td>5</td>
</tr>
<tr>
<td>15 Elevation Roof</td>
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<tr>
<td>16 Elevation</td>
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<tr>
<td>17 Internal Wall</td>
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</table>

### Floor Plan

<table>
<thead>
<tr>
<th>Item</th>
<th>Marks</th>
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<tbody>
<tr>
<td>18 Walls</td>
<td>9</td>
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<tr>
<td>19 Doors</td>
<td>5</td>
</tr>
<tr>
<td>20 Windows</td>
<td>6</td>
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<tr>
<td>21 Cutting Plane</td>
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<tr>
<td>22 Labels</td>
<td>2</td>
</tr>
<tr>
<td>23 Hatching</td>
<td>9</td>
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<tr>
<td>24 Plumbing Fixtures</td>
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</table>

**TOTAL** 103

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103 MARKS

ANSWER SHEET 4