NATIONAL SENIOR CERTIFICATE EXAMINATION
2011

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.
The figure shows the front view and incomplete top view of a PIPING ASSEMBLY. The assembly is made up of four parts:

A - square prismatic shell
B - square to round transition piece
C - truncated cylindrical pipe
D - double truncated cylindrical pipe

Draw the following:
2.1 Draw the given front view.
2.2 Draw the complete top view, clearly showing part D.
   Show all hidden detail.
2.3 The surface development of A (square prismatic shell).
2.4 The surface development of D (double truncated cylindrical pipe).
2.5 Show all construction.
   Do not draw the development of the Transition Piece (B) and
   the Truncated Cylindrical Pipe (C).
   Use point Q as your starting point.

ASSESSMENT CRITERIA
You will be assessed on your ability to do the following:
- draw the given front view  4
- draw the given top view  1
- draw the completed top view showing part D  12
- show all hidden detail in completed top view  2
- develop part A  4
- calculate the circumference of the circle  1
- develop part D  14
- draw all centre lines  2

ANSWER SHEET 2
The figure shows the three views of a dwelling. Draw a neat two-point perspective of the dwelling.

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

Label the vanishing points: LVP and RVP
SHOW NO HIDDEN DETAIL!

ASSESSMENT CRITERIA
You will be assessed on your ability to do the following:
- determine the vanishing points 2
- project from the station point 1
- project to the vanishing points 1
- determine the arch construction 4
- draw the two point perspective view 24

32 MARKS

EXAMINATION NUMBER
**QUESTION 4**

**CIVIL DRAWING**

Answer this question on ANSWER SHEET 4.

Use a scale of 1:50.

All drawings must comply with SABS 0143.

The following is given:

- An incomplete schematic floor plan of a GARDEN COTTAGE
  - window position and door position
  - perimeter dimensions and cutting plane A-A
- An incomplete schematic elevation
  - door position, ceiling height, ground level and floor level
  - Door and frame detail
  - Incomplete foundation detail
  - Roof detail, including purlin, batten and truss detail
  - Plumbing fixtures detail
  - Window detail
  - Electrical legend

**Draw the following:**

1) the complete floor plan
2) the complete sectional elevation, including the rest of the elevation that is not sectioned. (Include all outside roof and window detail.)

**FLOOR PLAN INSTRUCTIONS**

- Hatch all the external and internal walls
- Insert all window and door details and label the cutting plane
- Show all door detail at D1 and D2 only
- Label the floor plan and print the scale
- Indicate the room name for each room
- Insert the following electrical detail according to the legend given:
  - A THREE, 40 watt fluorescent tube light fitting in living area, a single wall mounted light outside both external doors, one three pole switch for three lights.
  - A battery operated smoke detector in the centre of the kitchen.
  - Insert the following plumbing detail according to the legend given:
    - A water closet (toilet), a corner bath, a wash basin in the bathroom.
    - A sink in the kitchen. (Decide on a suitable position)
  - Draw a double bed in the bedroom. (Decide on a suitable position)

**SECTIONAL ELEVATION INSTRUCTIONS**

- Complete the foundation details
- Insert all floor slab details
  - use 25 mm screed
  - use 150 mm compacted hardcore filling
- Label the ground level and damp proof course
- Draw the sectional door in the space indicated
  - use ONE, 245 x 75 concrete lintel above door
  - show door frame detail
  - label the damp proof course
- Complete the roof details
  - draw the roof truss
  - use 114 x 38 rafters and suitable truss plates for the truss
  - use FOUR 76 x 38 purline spaced at 2 176 centres
  - use TWO, 121 x 38 wall plates
  - use TWO 38 x 38 battens spaced at 639 centres
  - use asbestos sheeting for the roof and a 30° pitch
  - use 6 mm Gypsum ceiling boards
- Complete all hatching detail and label the sectional elevation
- Do not show plumbing on this elevation!

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**EXAMINATION NUMBER**
### Assessment Criteria

#### Sectional Elevation

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Marks</th>
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<tbody>
<tr>
<td>Ceiling Battens</td>
<td>2</td>
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<tr>
<td>Wall Plates</td>
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<tr>
<td>Ceiling Board</td>
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</tr>
<tr>
<td>Truss Plates</td>
<td>4</td>
</tr>
<tr>
<td>Roof Truss</td>
<td>5</td>
</tr>
<tr>
<td>Purlins</td>
<td>4</td>
</tr>
<tr>
<td>Roof</td>
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</tr>
<tr>
<td>Walls</td>
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<tr>
<td>Door</td>
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<tr>
<td>Elevation</td>
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#### Floor Plan

<table>
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<th>Marks</th>
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<tr>
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<tr>
<td>Windows</td>
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<td>Cutting Plane</td>
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<td>Labels</td>
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<td>Electrical</td>
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<td>Hatching</td>
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<td>Plumbing Fixtures</td>
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**TOTAL** 102

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102 MARKS