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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL
SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

NOVEMBER 2014

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.



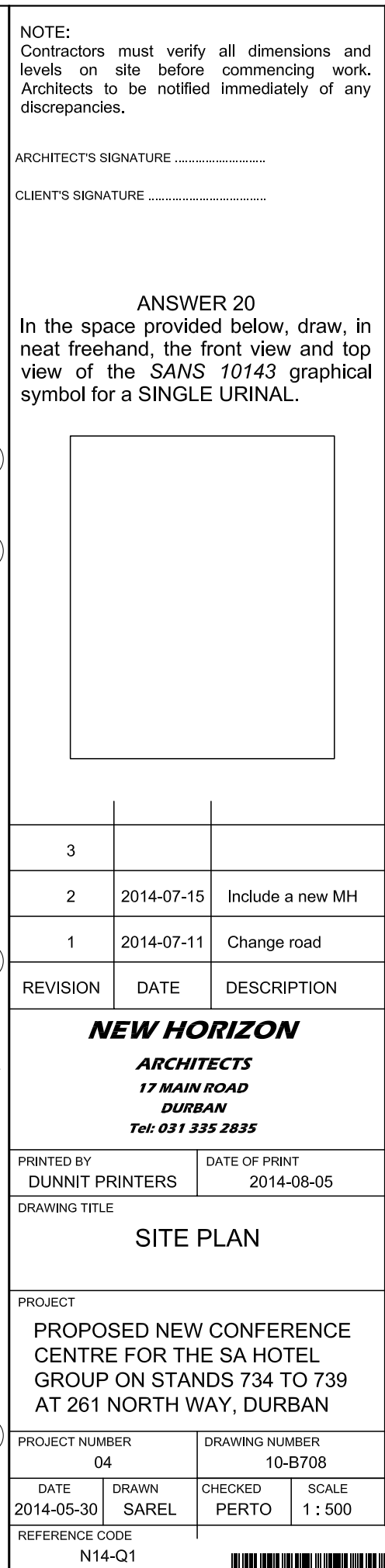
INSTRUCTIONS AND INFORMATION

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 completed using 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 must be re-stapled in numerical sequence, irrespective of whether the question was attempted.
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			½	SIGN	MODERATED			½
1									
2									
3									
4									
TOTAL									
	2	0	0			2	0	0	

FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING:
CENTRE NUMBER
CENTRE NUMBER
EXAMINATION NUMBER
EXAMINATION NUMBER



CLIENT'S SIGNATURE

Complete the table below by neatly answering the questions, which refer to the accompanying drawing and title panel. **[30]**

ANSWER 18
Show ALL calculations.

Diagram of a stepped area labeled "NEW CONFERENCE CENTRE". The area is defined by a top boundary (32500 + 8300 = 40800), a right boundary (22000 + 7100 = 29100), a bottom boundary (13500 + 27300 = 40800), and a left boundary (24000). The area is shaded grey.

ANSWER 19
Show ALL calculations.

EXAMINATION NUMBER
EXAMINATION NUMBER
2



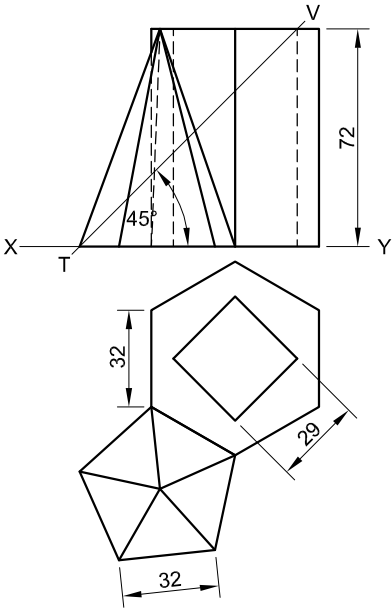
QUESTION 2: SOLID GEOMETRY

Given:
The front view and the top view of a right regular hexagonal prism with a right square hole and a right regular pentagonal pyramid

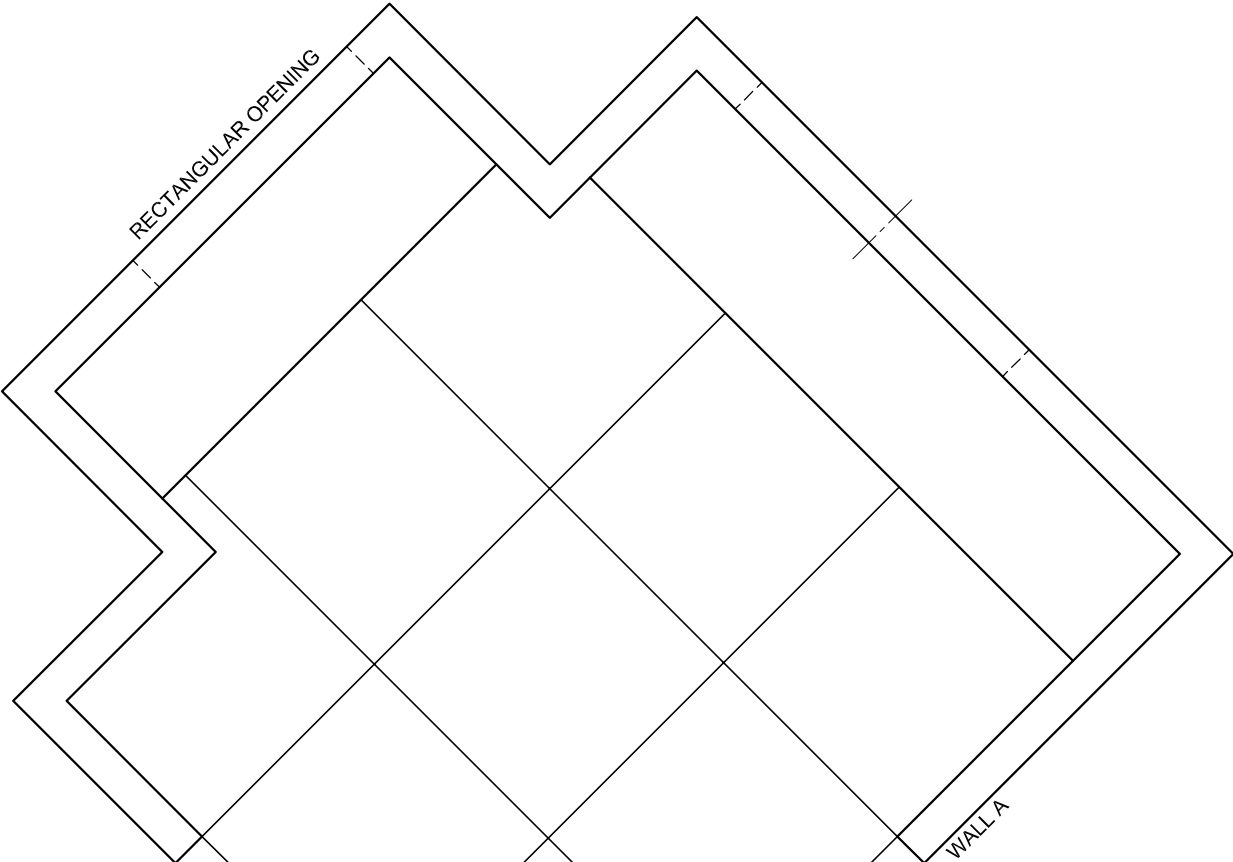
- Specifications:**
- One base edge of the hexagonal prism is in contact with one base edge of the pentagonal pyramid.
 - Both solids are cut by a cutting plane VT.

Instructions:
Draw, to scale 1 : 1, the following views of the TWO solids:
2.1 The given front view
2.2 The sectional top view
2.3 The sectional left view. Show ALL hidden detail.

Show ALL necessary construction. [38]



ASSESSMENT CRITERIA				
1	CONST. + FRONT VIEW	7		
2	SECTIONAL TOP VIEW	12½		
3	SECTIONAL LEFT VIEW	15		
4	HATCHING	3½		
PENALTIES (-)				
TOTAL		38		
EXAMINATION NUMBER				
EXAMINATION NUMBER				3



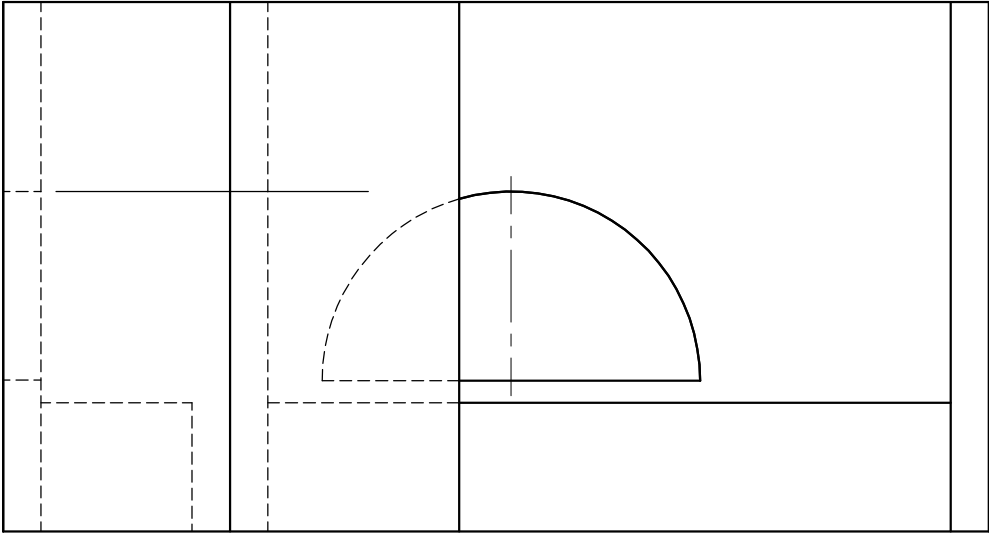
PP

HL

GL

+

SP



QUESTION 3: PERSPECTIVE

Given:
Two views of an outside entertainment area
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 necessary construction.
- Show the wall thickness at the openings.
- Show the floor tiles.
- NO hidden detail is required.

[39]

ASSESSMENT CRITERIA				
1	CONSTRUCTION + VP's	7		
2	WALLS + TILES	15		
3	OPENINGS + SEATING	10		
4	SEMI-CIRCLE	7		
PENALTIES (-)				
TOTAL		39		

INCOMPLETE NORTH ELEVATION

INCOMPLETE FLOOR PLAN

INCOMPLETE FOOTING AND INTERNAL WALL DETAIL

INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAIL

SCHEMATIC DIAGRAM OF A TRUSS FOR ROOF '1'

SCHEMATIC DIAGRAM OF A TRUSS FOR ROOF '2'

ROOM DESIGNATIONS

FEATURES
D DOOR
W1 WINDOW
W2 WINDOW

FIXTURES
S SINK
B BATH
BIC BUILT-IN CUPBOARD (600 mm deep)
WC TOILET
WB WASH BASIN

ELECTRICAL FIXTURES
1. CEILING LIGHT
2. WALL-MOUNTED LIGHT
3. DISTRIBUTION BOARD
4. FLUORESCENT LIGHT 2 X 40 W
5. LIGHT SWITCH - SINGLE-POLE
6. LIGHT SWITCH - TWO-POLE
7. SWITCHED SOCKET OUTLET

NOTE:
THE ARROWS SHOW THE LIGHT CONNECTION TO THE SWITCHES.

ROOF NOTES:
ROOF PITCH 20°

ROOF COVER 15 mm FIBRE CEMENT SHEET ON 75 x 50 mm PURLINS

115 x 38 mm ROOF TRUSS ON 115 x 38 mm WALL PLATES

9 mm CEILING BOARD ON 38 x 38 mm BRANDING STRIPS

200 x 25 mm FASCIA BOARDS WITH 150 x 100 mm GUTTER ON BOTH ENDS

Ø100 mm RAIN-WATER DOWN PIPE

400 x 400 x 200 mm GULLY

FLOOR FINISHES
KITCHEN: TILES
LOUNGE: CARPET
BATHROOM: TILES
BEDROOM: CARPET

DOOR AND WINDOW SCHEDULE	
	DOOR FRAME AND DOOR (D)
	WINDOW (W1)
	WINDOW (W2)

WINDOW NOTE:
A = OPENING SIDE
B = HINGED SIDE
C = FIXED PANEL

NOTE: 150 x 25 mm FIBRE CEMENT SILL UNDER ALL WINDOWS

ELECTRICAL SYMBOLS	

ROOF COMPONENTS	
	115 x 38 mm WALL PLATE
	75 x 50 mm PURLINS
	FASCIA BOARD
	ROOF CAP

FIXTURES	
	SINK (S)
	BATH TUB (B)
	TOILET (WC)
	WASHBASIN (WB)

QUESTION 4: CIVIL DRAWING

- Given:**
- The incomplete north elevation of a new **dwelling**, showing the walls, the roof and notes
 - The incomplete floor plan showing the walls, position of the doors and windows, the fixtures and electrical layout
 - The incomplete detail of the footing/foundation of an internal and an external wall
 - Roof notes with schematic diagrams of the TWO types of roof trusses
 - A diagram showing the room designations and a list of floor finishes
 - A door and window schedule
 - A table of electrical symbols
 - A table of roof components
 - A table of fixtures
 - The incomplete floor plan of the new **dwelling**, drawn to scale 1 : 50, on page 6

- Instructions:**
- Answer this question on page 6.
 - Using the given incomplete floor plan, draw, in first-angle orthographic projection and to scale 1 : 50, the following views of the new **dwelling**:
 - 4.1 The complete floor plan
 - 4.2 The complete north elevation
 - 4.3 A sectional elevation on cutting plane A-A
 - ALL drawings must comply with the **guidelines** and **graphical symbols** contained in the *SANS 10143*.

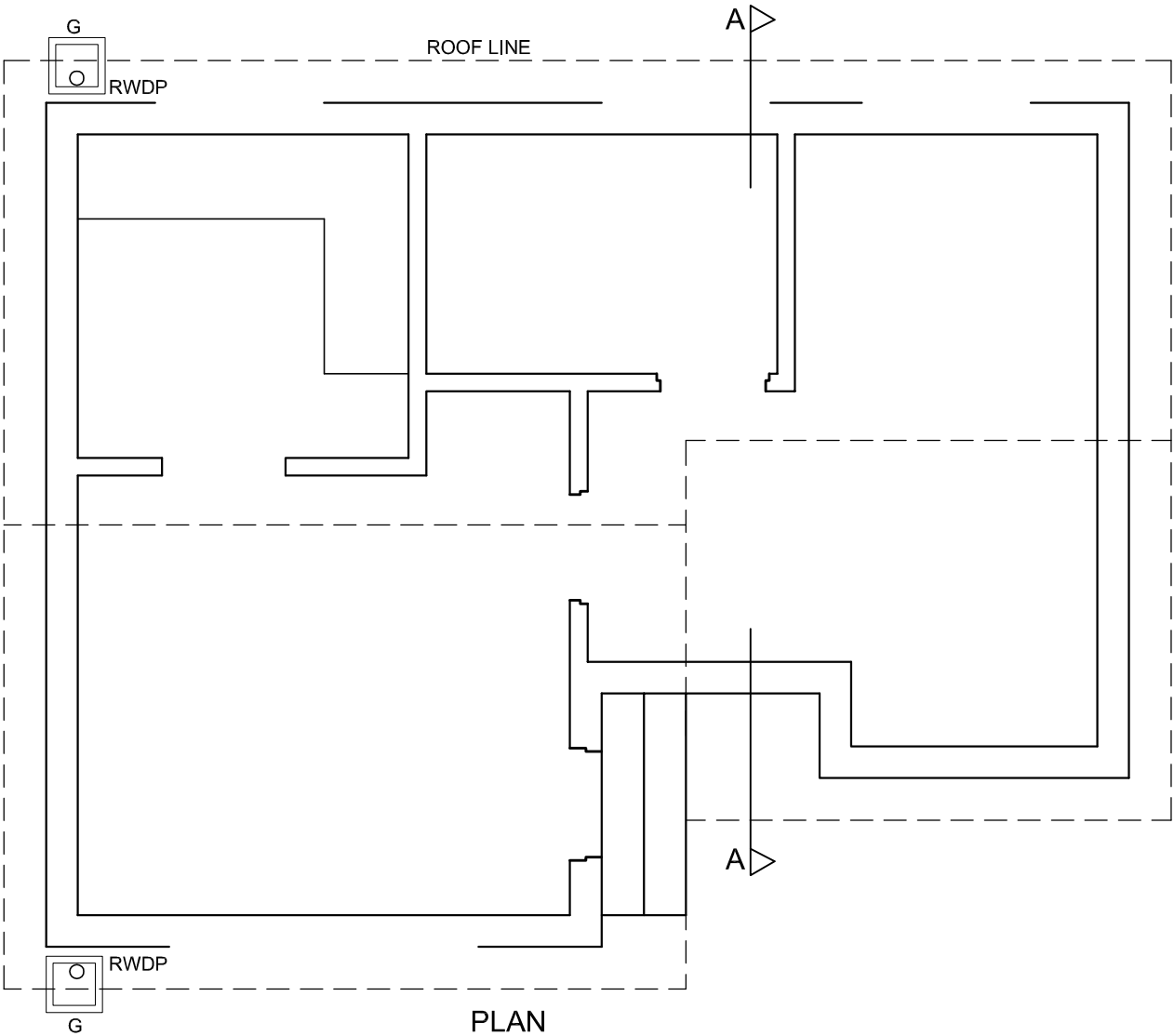
- SPECIFICATIONS:**
THE FLOOR PLAN
- Add the following features to the drawing:**
- ALL the doors and windows
 - ALL the fixtures as indicated by abbreviations
 - ALL the electrical fittings as indicated by numbers
 - ALL hatching detail

- THE NORTH ELEVATION
- Show the following features on the drawing:**
- The outside walls, steps and finished floor level
 - The roof detail, including the fascia board, gutter, rainwater down pipe and gully
 - The window detail

- THE SECTIONAL ELEVATION
- Show the following features on the drawing:**
- The complete footing or foundation, wall, roof and ceiling detail
 - The window detail, with a DOUBLE lintel
 - ALL features to the west of the cutting plane
 - ALL hatching detail

- Label the following:**
- The room designations and floor finishes
 - The sectional elevation and the north elevation
 - Using the correct abbreviations, label the following features in the correct view: ground level, finished floor level and damp-proof course.

NOTE:
ONLY the substructure hatching may be drawn in neat freehand.



PLAN
SCALE 1 : 50



PENALTIES		
INCORRECT OVERALL SCALE		
INCORRECT POSITIONING OF VIEWS		
NON-ALIGNMENT OF VIEWS		
TOTAL		

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATE
1	LABELS	4			
2	ELECTRICAL	9			
3	DOORS + WINDOWS	11			
4	FIXTURES	4			
5	HATCHING	4			
SUBTOTAL		32			
NORTH ELEVATION					
1	WALLS + FFL	5			
2	ROOF + FACIA BOARD + GUTTER + RWDP	7			
3	WINDOW	5½			
4	LABELS	1½			
SUBTOTAL		19			
SECTIONAL ELEVATION					
1	ROOF + FACIA BOARD + GUTTER + RWDP	15			
2	WALLS + FLOOR + FOUNDATION	18			
3	HATCHING	6½			
4	LABELS	2½			
SUBTOTAL		42			
PENALTIES (-)					
TOTAL		93			
EXAMINATION NUMBER					
EXAMINATION NUMBER					6