INSTRUCTIONS AND INFORMATION

1. This question paper consists of THREE questions
2. Answer ALL the questions.
3. Drawings are in first-angle orthographic projection or third--angle orthographic projection.
4. ALL drawings must be drawn to scale 1:1, unless stated otherwise.
5. ALL questions must be answered on the DIAGRAM SHEET as instructed.
6. ALL the pages must be stapled in numeric sequence, irrespective of whether the question was attempted or not.
7. Time management is essential in order to complete all the questions.
8. Print your name and surname as well as the grade in the space provided on each page.
9. ALL answers must be drawn accurately and neatly.
10. ALL necessary construction and projection lines must be shown.
11. Plan each drawing carefully from the given position, which is indicated on the diagram sheets.
12. Any details or dimensions not given must be assumed in good proportion.

ENGINEERING GRAPHICS AND DESIGN P1

GRADE 11

NOVEMBER 2020

TIME: 2 HOURS

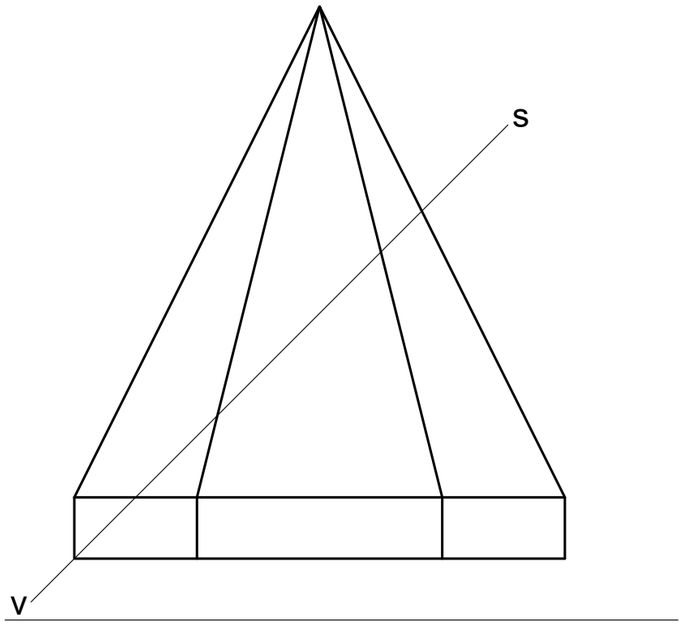
TOTAL: 120

This question paper consists of 5 pages

FOR OFFICIAL USE ONLY								
QUESTION	MARKS OBTAINED			½	MODERATEF			½
1								
2								
3								
TOTAL								
	1	2	0		1	2	0	

FINAL CONVERTED MARK	CHECKED BY
$\frac{}{120}$	

NAME & SURNAME



QUESTION 1: SOLID GEOMETRY

Given:

- The front view and top view of a right regular hexagonal pyramid attached to a separate tight hexagonal prism.
- A complete front view.

Specifications

- The two solids are sectioned by section line VS.

Draw the following views of the solids:

- A sectional front view.
- A sectional left view.
- The true shape of the sectioned area.

Show all necessary constructions and hidden detail.

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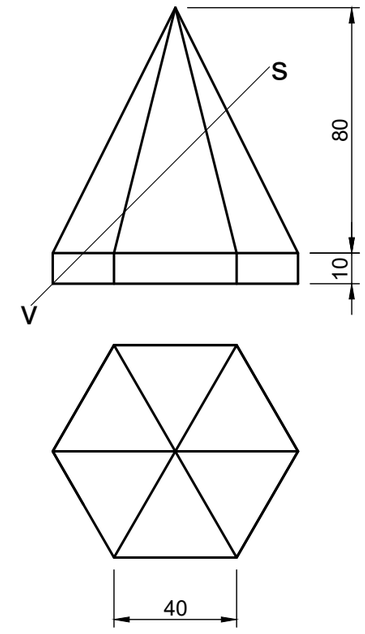
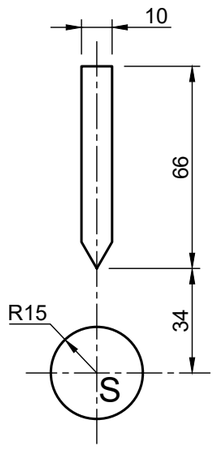


ASSESSMENT CRITERIA				
1	TOP VIEW	10.5		
2	LEFT VIEW	8		
3	TRUE SHAPE	5,5		
PENALIZING (-)				
	TOTAL	24		

NAME & SURNAME



QUESTION 2: LOCI (CAM)

Given:
- The detail of a wedge-shaped follower and the camshaft
- The displacement graph 0° start position on the drawing sheet
- The cam shaft centre position S on the drawing sheet

Specifications:
- The follower reciprocates on the vertical centre line of the camshaft
- Rotation is counter clockwise
- The camshaft rotate with uniform speed

Motion:
The cam imparts the following motion to the follower:
- Over the first 60° the follower rises 30 mm.
- The follower is at rest for the next 60°.
- The follower rises a further 30 mm over the next 60°.
- The follower is at rest for the next 30° .
- The follower falls 10 mm over the next 30°.
- The follower is at rest for the next 15° .
- The follower falls 40 mm until it reach 300°.
- The follower returns to its original position over the final 60°.

Instructions:
- Draw, to scale 1 : 1, the given camshaft and the wedge-shaped follower at the minimum distance
- Draw to a rotational scale of 30° equal to 10 mm and a displacement scale of 1 : 1, the complete displacement graph of the required motion
- Project and draw the cam profile form the displacement graph
- Label the displacement graph and include both the scales
- Show the direction of rotation on the cam profile
- Show all construction and projection lines

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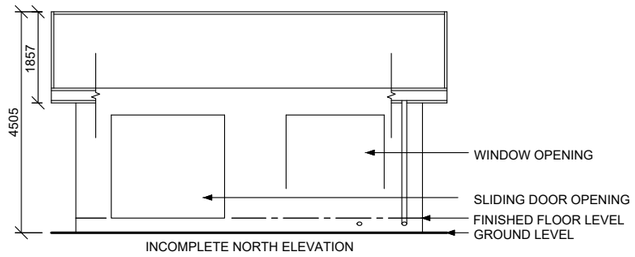
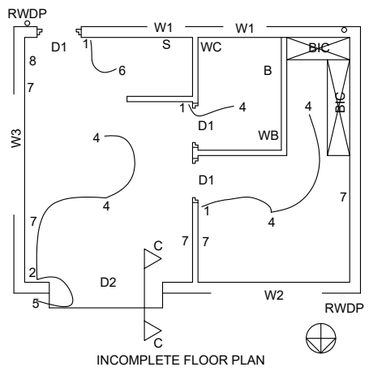
ASSESSMENT CRITERIA				
1	START POSITION + GIVEN + CENTRE LINES	4		
2	GRAPH CONSTRUCTION	8		
3	DISPLACEMENT GRAPH	7		
4	CAM CONSTRUCTION	3		
5	CAM + CURVE QUALITY	9		
PENALIZE (-)				
	TOTAL	31		

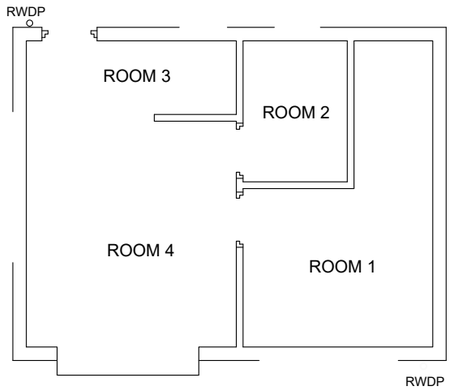
NAME & SURNAME



INCOMPLETE NORTH ELEVATION



INCOMPLETE FLOOR PLAN

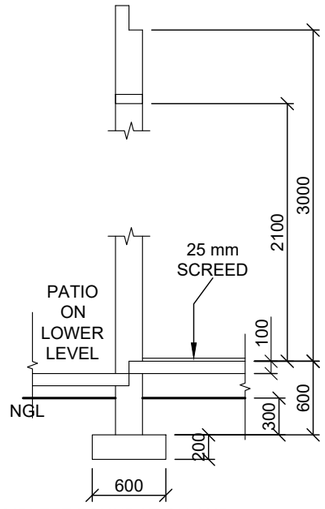


ROOM DESIGNATIONS AND FLOOR FINISHING

ROOM 1: BEDROOM	CARPET
ROOM 2: BATHROOM	TILES
ROOM 3: KITCHEN	TILES
ROOM 4: LOUNGE	WOOD

ELECTRICAL SYMBOLS		
NUMBER	SYMBOL	DESCRIPTION
1		SINGLE POLE SWITCH
2		DOUBLE POLE SWITCH
3		TRIPLE POLE SWITCH
4		CEILING MOUNTED LIGHT
5		WALL MOUNTED LIGHT
6	n x 40 W	2 X 40 W FLUORESCENT LIGHTS
7		SWITCH SOCKET OUTLET
8		DISTRIBUTION BOARD

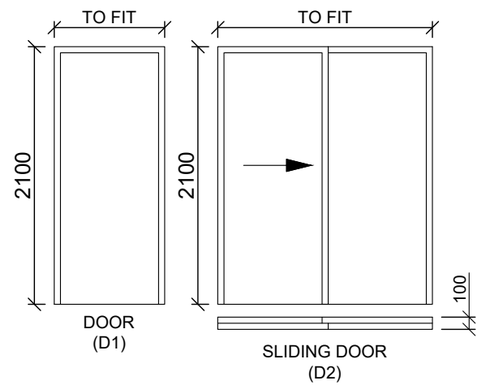
NOTE: REPLACE EACH NUMBER ON THE FLOOR PLAN WITH THE CORRESPONDING SYMBOL AS INDICATED AT THE END POINTS OF THE FREEHAND LINE REPRESENTING THE POWER CABLE JOINING THE DIFFERENT COMPONENTS WITH EACH OTHER



INCOMPLETE FOUNDATION AND EXTERNAL WALL DETAILED

LOAD BEARING WALLS = 200mm
NON LOAD BEARING WALLS = 110mm

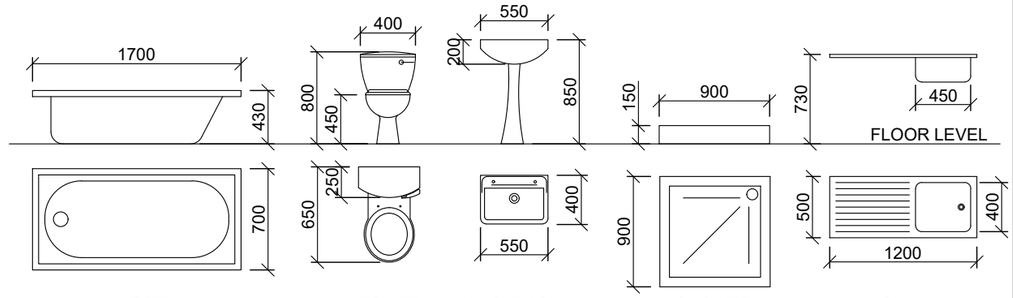
DOOR AND WINDOW SCHEDULE



DOOR AND WINDOW NOTES:

- A = OPENING SIDE
- B = HINGED SIDE
- C = FIXED PANEL
- 150 x 20 mm FIBRE CEMENT SILL (30°) UNDER ALL WINDOWS
- 200 x 75 mm LINTEL ABOVE ALL DOOR & WINDOW OPENINGS
- ALL LINTELS ARE AT THE SAME HEIGHT
- ALL FRAMES 50mm THICK

FIXTURES



QUESTION 4: CIVIL DRAWING

Given:

- The incomplete floor plan showing the walls, position of the doors, windows, fixtures and electrical layout
- The incomplete north elevation showing the walls, window openings and roof
- The incomplete foundation and external wall detail
- Room designations and floor finishes
- A door and window schedule
- A table of electrical features
- A table of features and fixtures
- The incomplete floor plan and north elevation of the new house, drawn to scale 1 : 50 and the incomplete foundation, roof detail and break line of the detailed section view, drawn to scale 1 : 20 on page 5

Instructions:

Answer this question on page 5.

4.1 Use the given incomplete floor plan, incomplete elevation view and incomplete section view and draw, in first-angle orthographic projection and to a **scale 1 : 50**, the following views of the new house:

4.1.1 THE COMPLETE FLOOR PLAN.

Add the following features to the drawing:

- ALL doors and windows
- ALL fixtures as indicated by abbreviations
- Copy ALL electrical fittings as a symbol to the corresponding number as indicated on the incomplete floor plan. The given freehand lines show the electrical cable connections from the switch towards the lights
- ALL hatching detail.

4.1.2 THE COMPLETE NORTH ELEVATION.

Show the following features on the drawing:

- The outside walls, step door detail and window detail
- The natural ground level and finished floor level

4.2 Use the incomplete wall detail and break line on page 5 and draw, to scale 1:20, a detailed section view on cutting plane C-C of the area in the ellipse shown on the incomplete floor plan.

Show the following features on the drawing:

- The complete detail of the foundation, wall and door detail
- ALL hatching detail. Only the substructure hatching may be drawn in neat free hand

Label the following:

- The room designations and floor finishes
- Ground level, finished floor level and damp prove coarse as abbreviations on all relevant views

NOTE:

- ALL drawings must comply with the guidelines and graphical symbols as contained in the *SANS 10143.*

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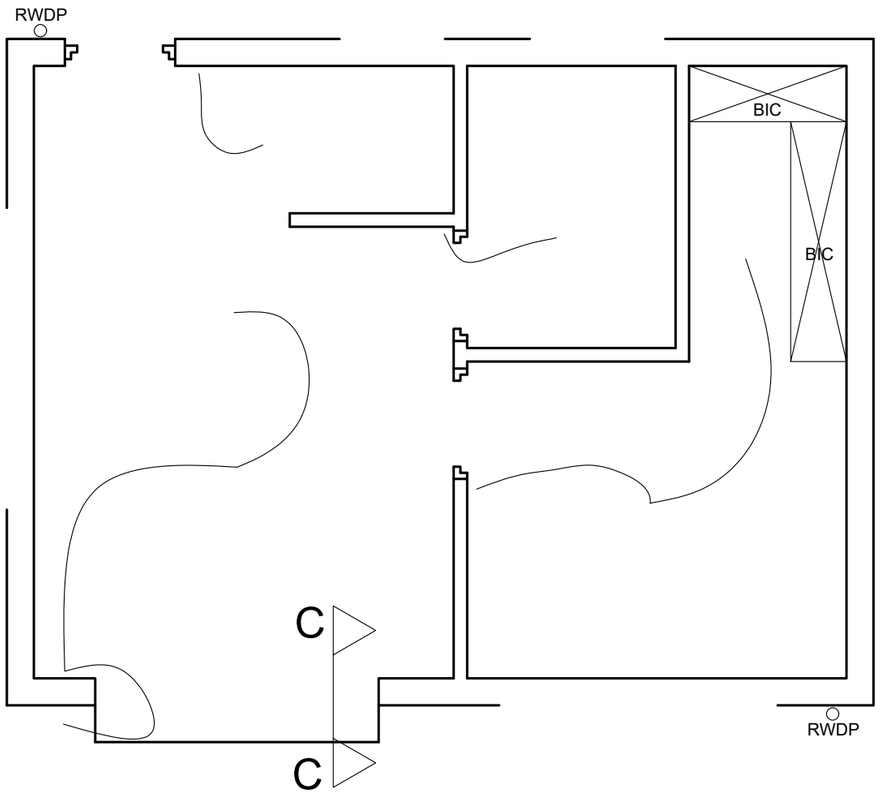

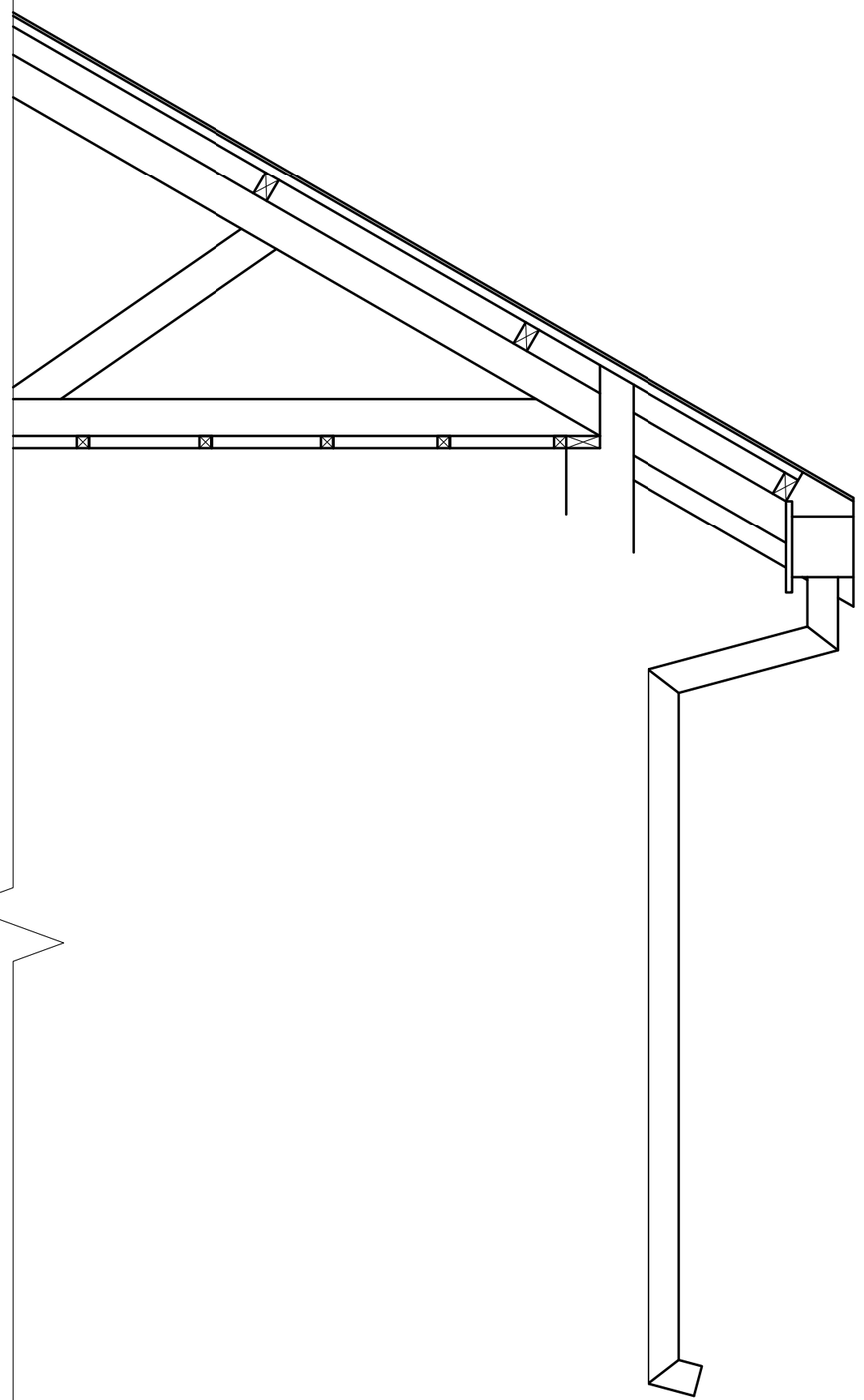

PENALIZING FOR OFFICE USE ONLY	
INCORRECT SCALE(S) USED	-2
NON-ALIGNMENT OF VIEWS	-2
VIEW(S) ROTATED	-2
SECTION VIEWED INCORRECTLY	-2
INCORRECT LETTERING	-1
TOTAL	

ASSESSMENT CRITERIA				
FLOOR PLAN				
1	DOORS + WINDOWS	14		
2	FIXTURES	6.5		
3	ELECTRICAL FEATURES	8.5		
	HATCHING	4		
5	LABELS	5		
	SUB TOTAL 1	**38**		
NORTH ELEVATION				
1	WALLS + FFL + STEP	3.5		
2	DOOR + WINDOW	8.5		
3	LABELS	1		
	SUB TOTAL 2	**13**		
DETAILED SECTION				
1	FOUNDATION + WALL + SLAB	7.5		
2	SLIDING DOOR + LINTEL	2.5		
3	HATCHING	4		
	SUB TOTAL 3	**14**		
	TOTAL	**65**		
	TOTAL PENALTIES (-)			
	GRAND TOTAL			

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