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**SA EXAM  
PAPERS**

STAPLE



# basic education

Department:  
Basic Education  
REPUBLIC OF SOUTH AFRICA

NATIONAL  
SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P1

NOVEMBER 2015

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, irrespective of whether the question was attempted or not, must be re-stapled in numerical sequence in the TOP LEFT-HAND CORNER ONLY.
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			$\frac{1}{2}$	SIGN	MODERATED			$\frac{1}{2}$	SIGN	RE-MARKING
1											
2											
3											
4											
TOTAL											
	2	0	0			2	0	0			2 0 0

FINAL CONVERTED MARK

CHECKED BY

100

COMPLETE THE FOLLOWING:

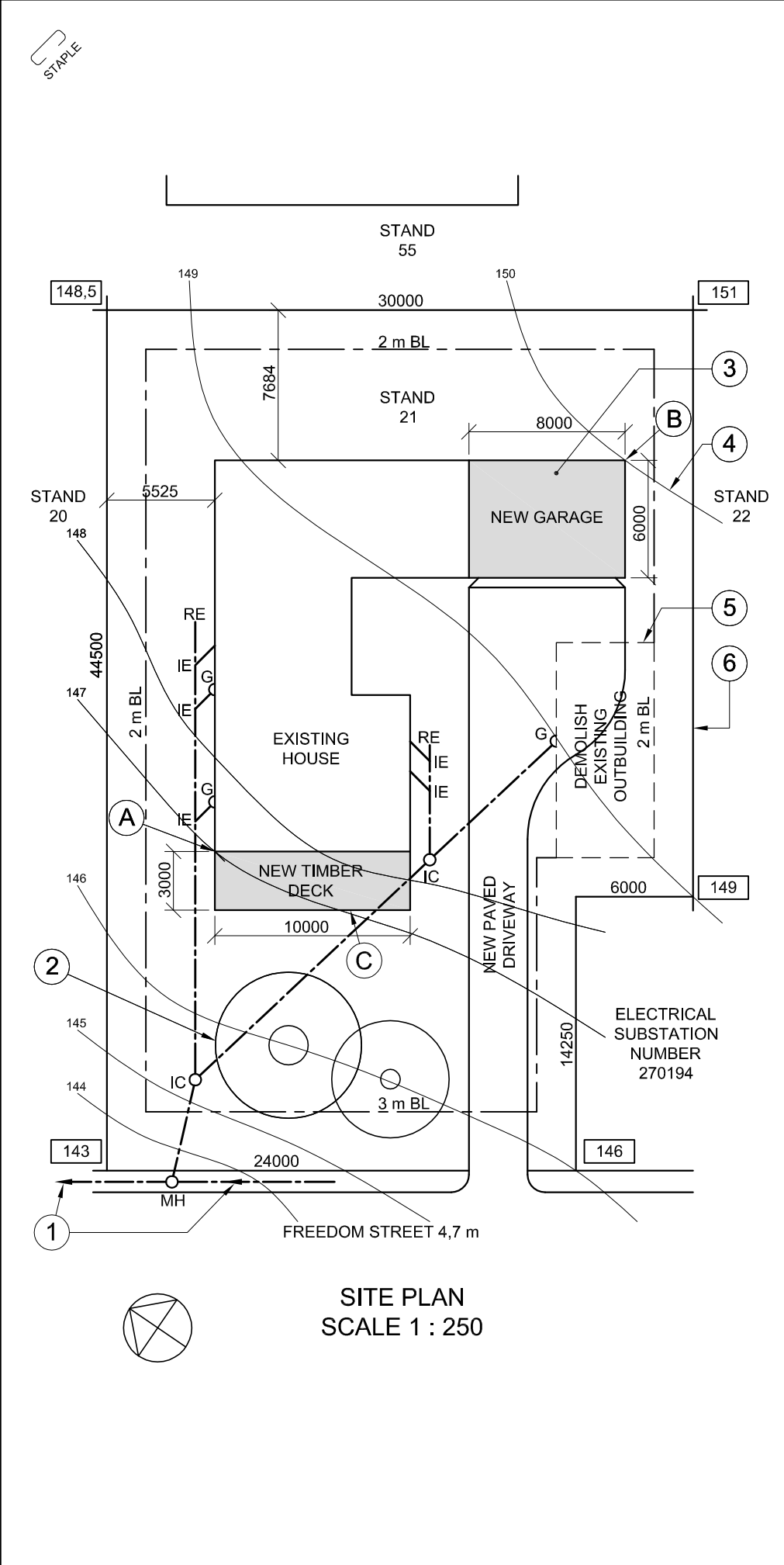
CENTRE NUMBER

CENTRE NUMBER

EXAMINATION NUMBER

EXAMINATION NUMBER



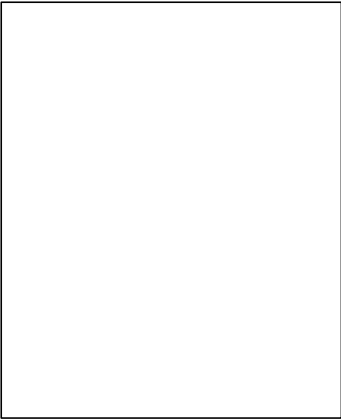


NOTE:  
Contractors must verify all dimensions and levels on site before commencing work. Architects must be notified immediately of any discrepancies.

ARCHITECT'S SIGNATURE .....

CLIENT'S SIGNATURE .....

ANSWER 20  
In the space below, draw, in neat freehand, the front view and top view of the SANS 10143 graphical symbol for a BATH.



1	2015-01-27	Add timber deck
REVISION	DATE	DESCRIPTION
<b>KEY ARCHITECTS</b> 96 Protea Street POTCHEFSTROOM  083 130 2201 key@webmail.co.za		
PRINTED BY ILM PRINTERS		DATE OF PRINT 2015-02-13
DRAWING TITLE <b>SITE PLAN</b>		
PROJECT PROPOSED NEW GARAGE AND TIMBER DECK FOR MRS SCHUTTE ON STAND 21, FREEDOM STREET.		
PROJECT NUMBER AFSP-2015		DRAWING NUMBER VG 002
DATE 2015-01-10	DRAWN AD	CHECKED BC
REFERENCE CODE Q1P1N2015		SCALE 1 : 250



QUESTION 1: ANALYTICAL (CIVIL)

Given:

The site plan of a existing house with a proposed new garage and timber deck, a title panel and a table of questions. The drawing has not been prepared to the indicated scale.

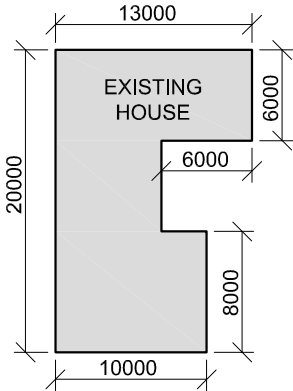
Instructions:

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

QUESTIONS		ANSWERS		
1	What is the project number?	1		
2	How many signatures are required?	1		
3	How many revisions have been made to the drawing?	1		
4	Who is the client?	1		
5	On what date was the site plan printed?	1		
6	How many new additions are indicated on the site plan?	1		
7	What does the abbreviation /C stand for?	1		
8	What is indicated by the arrows on the line at 1?	1		
9	Name the feature at 2.	1		
10	In what colour should the feature at 3 be shown?	1		
11	What does the line at 4 indicate?	1		
12	What does the broken line at 5 indicate?	1		
13	What is the length of the boundary line at 6 in metres?	1		
14	What is the width of Freedom Street in millimetres?	1		
15	What is the difference in ground level height between corner A and corner B of the buildings in metres?	2		
16	On which side of the existing house is the new timber deck?	2		
17	Which municipal service is found on the land adjacent to stand 21?	2		
18	In the space below, determine the perimeter of the existing house in metres.		3	
19	In the space below, determine the combined total area of the existing house and the new garage in square metres.		3	
20	In the space provided in the title panel, draw, in neat freehand, the front view and top view of the SANS 10143 graphical symbol for a BATH.		4	

TOTAL 30

ANSWER 18  
Show ALL calculations.



ANSWER 19  
Show ALL calculations.

EXAMINATION NUMBER	
EXAMINATION NUMBER	2

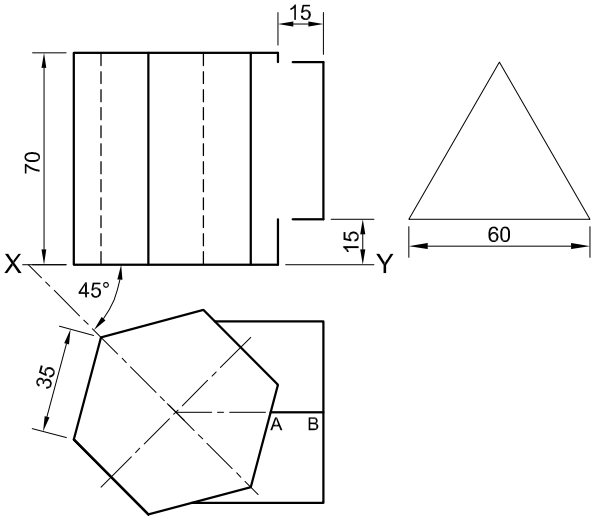


QUESTION 2: INTERPENETRATION AND DEVELOPMENT

- Given:**
- The incomplete front view and top view of an equilateral triangular prism that has been shaped to fit around a right regular hexagonal prism. The axes of both prisms lie in a common vertical plane.
  - An auxiliary view of the triangular prism.

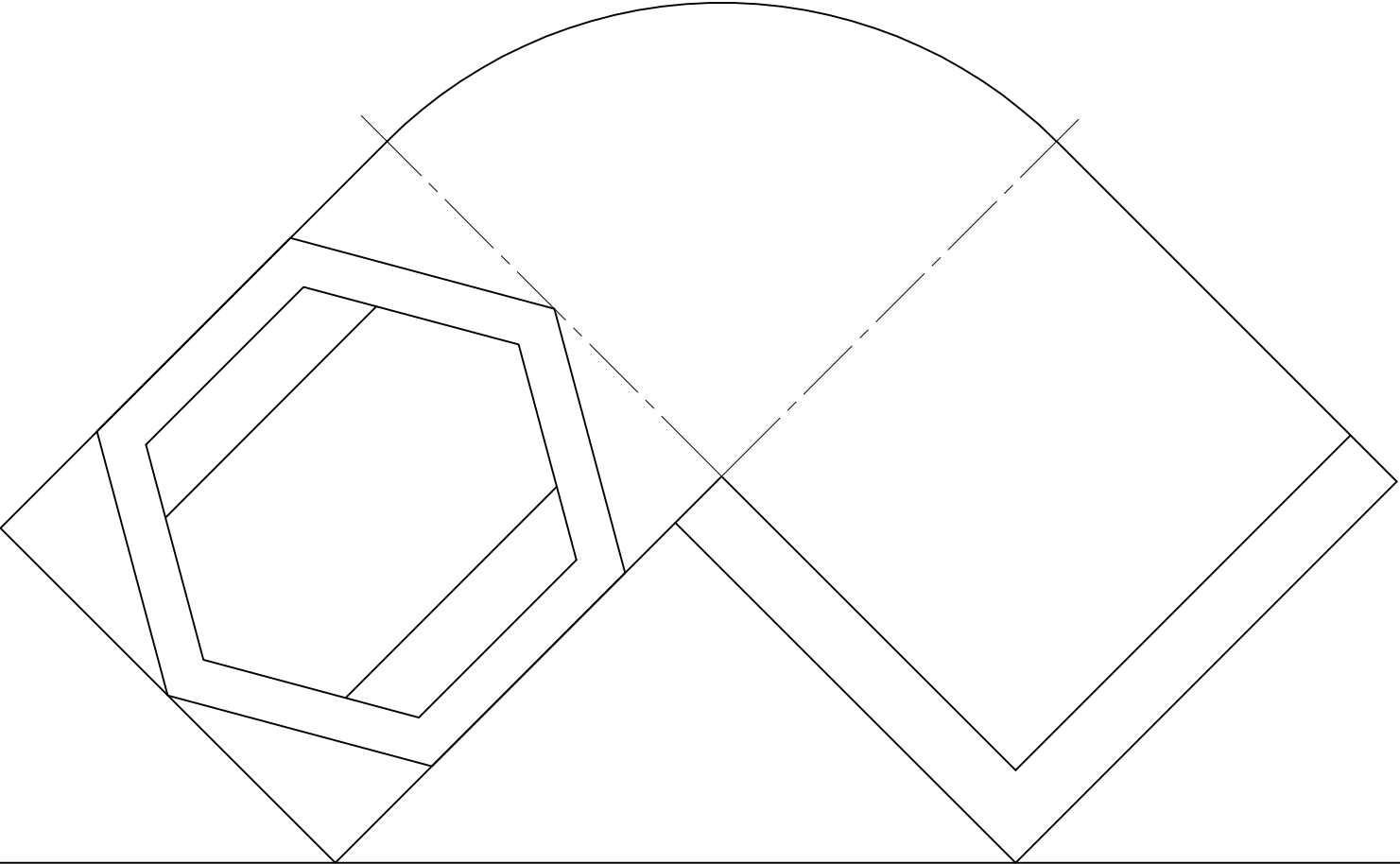
- Instructions:**  
Draw, to scale 1 : 1, the following:
- 2.1 The given top view
  - 2.2 The complete front view clearly showing the curve of interpenetration
  - 2.3 The complete right view
  - 2.4 The development of the surface of the triangular prism
- Make **AB** the seam.

- Show ALL hidden detail.
- Show ALL necessary construction. **[35]**



AB IS THE SEAM.

ASSESSMENT CRITERIA				
1	TOP VIEW	6		
2	FRONT VIEW	11		
3	RIGHT VIEW	7		
4	DEVELOPMENT	11		
PENALTIES (-)				
TOTAL		35		
EXAMINATION NUMBER				
EXAMINATION NUMBER				3



PP and HL

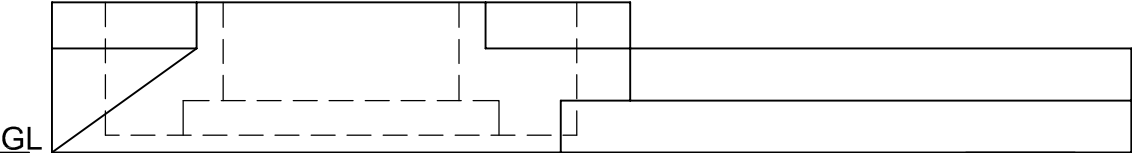
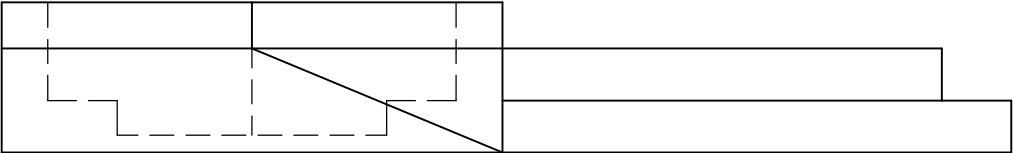
QUESTION 3: PERSPECTIVE

**Given:**  
Three views of a wooden deck with a hexagonal pool 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.
  - NO hidden detail is required.
- [39]

ASSESSMENT CRITERIA					
1	CONSTRUCTION + VPs	6			
2	BASE + STAIRS	12½			
3	POOL	13½			
4	CIRCULAR ARC	7			
PENALTIES (-)					
TOTAL		39			

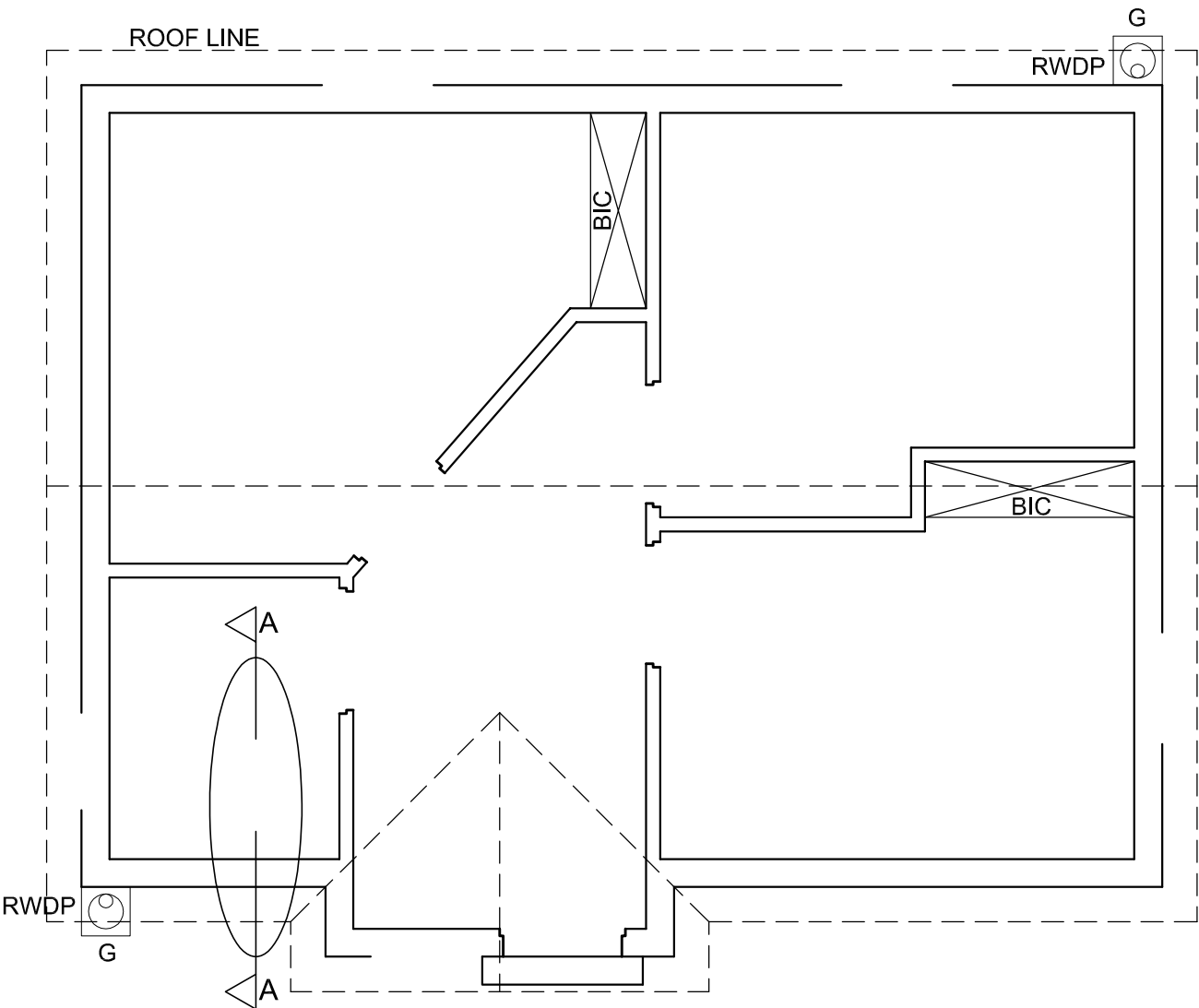


GL

+  
SP

EXAMINATION NUMBER	
EXAMINATION NUMBER	
4	





FLOOR PLAN  
SCALE 1 : 50

DETAILED SECTION ON A-A  
SCALE 1 : 20



FOR OFFICIAL USE ONLY		
INCORRECT SCALE(S)		
NON-ALIGNMENT OF VIEWS		
FEATURES DRAWN IN FREEHAND		
TOTAL PENALTIES (-)		

MARK ALLOCATION FOR SECTION OF ROOF (4.2 No. 1)										
A	B	C	D	E	F	G	H	I	J	

ASSESSMENT CRITERIA					
FLOOR PLAN					
		POSSIBLE	OBTAINED	SIGN	MODERATE
1	DOORS + WINDOWS	15			
2	ELECTRICAL	9			
3	FIXTURES	4			
4	HATCHING	4			
5	LABELS	5			
SUBTOTAL		37			
NORTH ELEVATION					
1	ROOF	8½			
2	WALLS + RWDP + FFL + GULLEY	6½			
3	DOOR + WINDOW	6			
4	LABELS	1½			
SUBTOTAL		22½			
DETAILED SECTION					
1	ROOF DETAIL	11			
2	FOUNDATION + WALL + RWDP + GULLEY + LINE BREAK	11			
3	WINDOW + WC + WB	9½			
4	HATCHING	4			
5	LABELS	1			
SUBTOTAL		36½			
TOTAL		96			
TOTAL PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					6