

STAPLE



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

ENGINEERING GRAPHICS AND DESIGN P2

2019

MARKS: 100

TIME: 3 hours

This question paper consists of 6 pages.

Barcode label



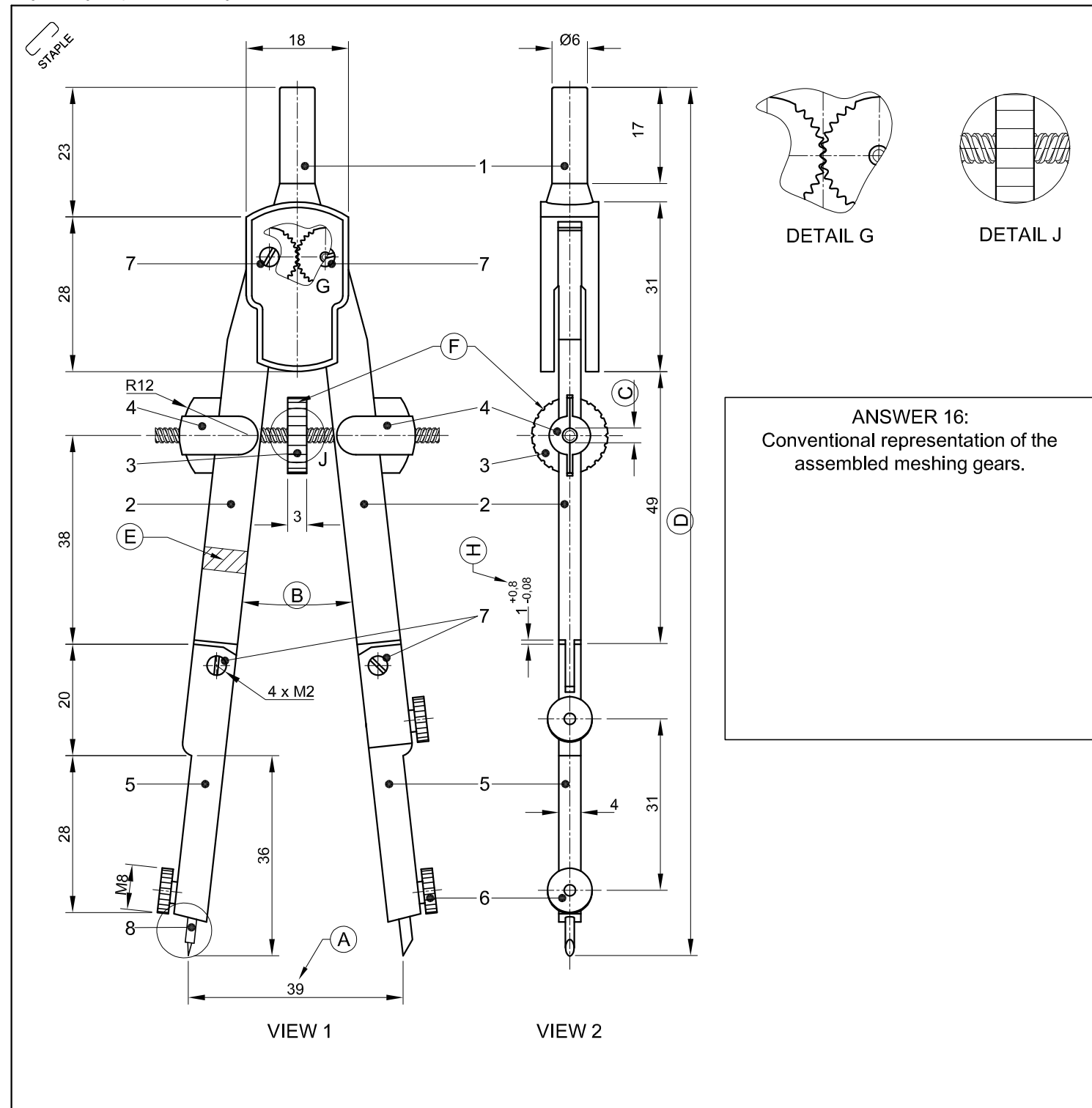
INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. ALL drawings are in third-angle orthographic projection, unless otherwise stated.
4. ALL drawings must be prepared using pencil and 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			$\frac{1}{2}$	SIGN
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



ANSWER 16:
Conventional representation of the assembled meshing gears.

QUESTION 1: ANALYTICAL (MECHANICAL)

Given:

The front view and the right view of a compass, two detailed enlargements, a parts list, a title block, a welding symbol and a table of questions. The drawing has not been prepared to the indicated scale.

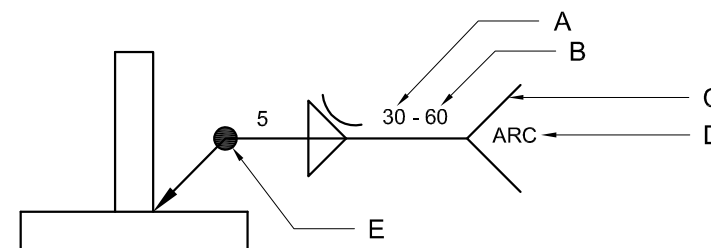
Instructions:

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

QUESTIONS		ANSWERS	
1	What is the title of the drawing?	1	
2	Who prepared the drawing?	1	
3	What material is used to manufacture the needle point?	1	
4	How many parts make up the compass assembly?	1	
5	What is VIEW 2 called?	1	
6	What would be an advantage of a compass with an adjustment shaft and wheel?	1	
7	What is the purpose of part 4?	1	
8	With reference to the dimension at A, what will the diameter of the circle be at the current setting?	1	
9	Measure the angle at B.	1	
10	Determine the complete dimensions at: C: D:	2	
11	Name the type of section at E.	1	
12	Name the finish on the adjustment wheel at F.	1	
13	What is the purpose of the finish on the adjustment wheel at F?	1	
14	With reference to the tolerance, determine the minimum dimension at H?	1	
15	With reference to the welding symbol below, match the letter on the welding symbol with the label in the column to the right of this question.	5	
		FIELD/SITE WELD	
		TAIL	
		WELD LENGTH	
		WELD PITCH	
		WELD PROCESS	
16	With reference to DETAIL G, draw, in neat freehand and in the space provided on the drawing sheet (ANSWER 16), the SANS 10111 conventional representation of the assembled meshing gears.	6	
17	In the space below (ANSWER 17), draw, in neat freehand, the symbol for the projection system used.	4	
TOTAL		30	

PARTS LIST			APPROVED: SAMUEL	DATE: 2018-06-07
PART	QUANTITY	MATERIAL	CHECKED: JONAS	DATE: 2018-05-01
1	GRIP	1	PLASTIC	DRAWN: WESSLY
2	LEGS	2	PEWTER	DATE: 2018-03-30
3	M3 ADJUSTMENT SHAFT AND WHEEL	1	STEEL + PLASTIC	DRAWING PROGRAM: AUTOCAD 2018
4	QUICK RELEASE	2	PLASTIC	SCALE 1 : 1
5	EXTENSION	2	PEWTER	BEST STATIONERY 123 Pencil Road Johannesburg www.beststationery.com
6	STUD + LOCK WHEEL	3	STEEL + PLASTIC	
7	M2 LOCK SCREW	4	TOOL STEEL	
8	NEEDLE POINT	1	TOOL STEEL	

QUESTION 15: Welding symbol



ANSWER 17: Projection symbol

EXAMINATION NUMBER

EXAMINATION NUMBER

2





QUESTION 2: LOCI

NOTE: Answer QUESTIONS 2.1 and 2.2.

2.1 MECHANISM

Given:

- A schematic drawing of a mechanism consisting of crank AB, connecting rod BC, connecting rod CD and crank DE.
- The position of centre point A on the drawing sheet

Specifications:

- The positions of A and E are fixed
- Connecting rod BC is pin-jointed to crank AB at B
- Connecting rod CD is pin-jointed to connecting rod BC at C
- Connecting rod CD is pin-jointed to crank DE at D

Motion:

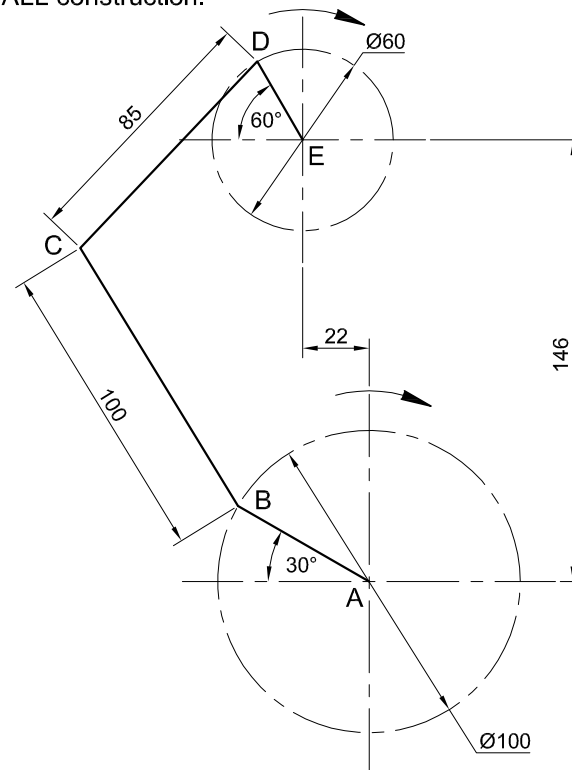
During the motion, both crank AB and crank DE rotate in a clockwise direction and at the same velocity.

Instructions:

- Draw, to scale 1 : 1, the given schematic drawing of the mechanism.
- Trace the locus generated by point C for ONE complete rotation of the two cranks.

Show ALL construction.

[19]



A

ASSESSMENT CRITERIA 2.1

1	GIVEN	7		
2	CONSTRUCTION	5		
3	POINTS + CURVE	7		
PENALTIES				
TOTAL		19		



QUESTION 2.2: CHUTE (HELIX)

Given:

- The top view and incomplete front view showing the starting position, mid-position and end position of a chute
- The centre lines for the top view and the front view of the chute

Specifications:

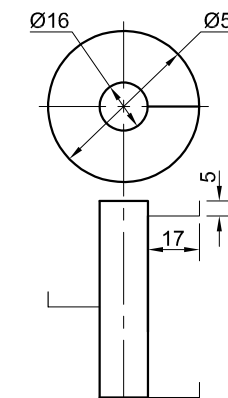
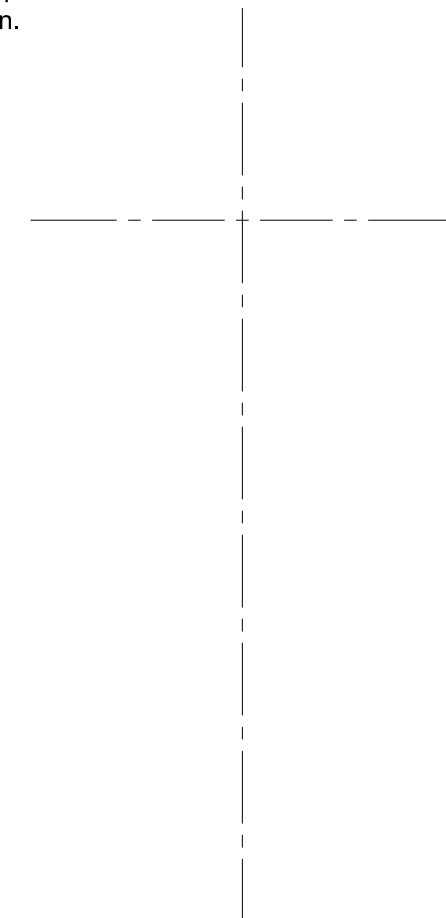
- Pitch: 60 mm Turns: ONE Rotation: LEFT HAND

Instructions:

Using the given centre lines, draw, to scale 1 : 1, the given top view and complete front view of the chute.

- NO hidden detail is required.
- Show ALL construction.

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ASSESSMENT CRITERIA 2.2

1	GIVEN TOP VIEW	1 1/2		
2	CONSTRUCTION	5		
3	OUTER HELIX	9		
4	INNER HELIX + SHAFT	3 1/2		
PENALTIES				
2.2 SUBTOTAL		19		
2.1 SUBTOTAL		19		
TOTAL		38		

EXAMINATION NUMBER

EXAMINATION NUMBER

3



QUESTION 3: ISOMETRIC DRAWING

Given:

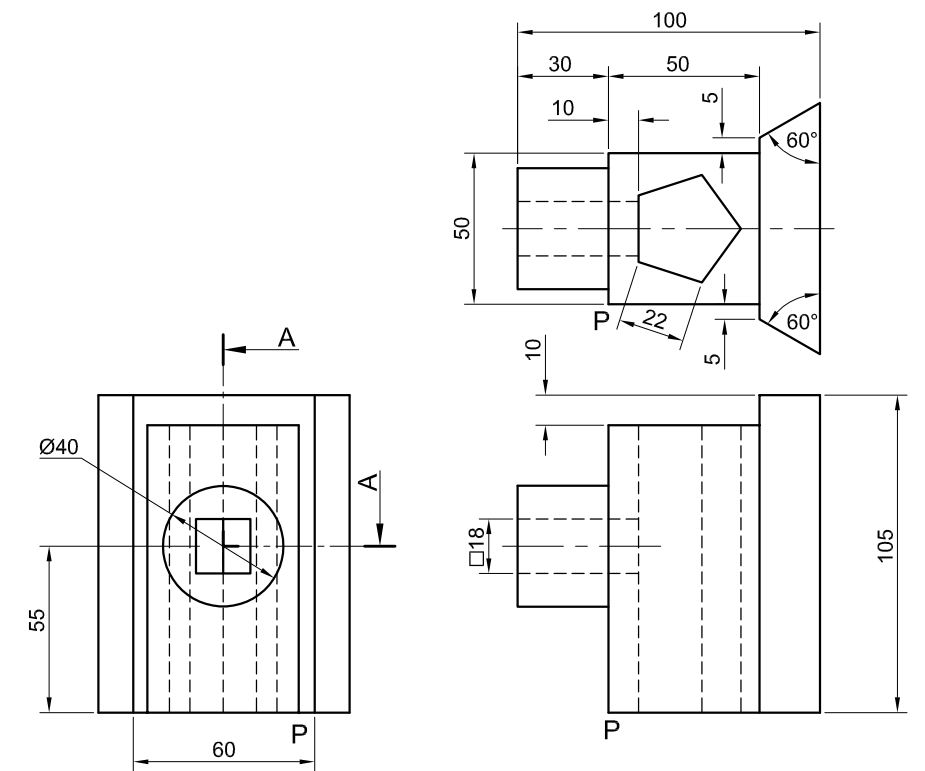
- The front view, top view and left view of a punch guide with a regular pentagonal hole
- The position of point P on the drawing sheet

Instructions:

Using scale 1 : 1, convert the orthographic views of the punch guide into a sectional isometric drawing on cutting plane A-A.

- Make P the lowest point of the drawing.
- Show ALL construction.
- NO hidden detail is required.

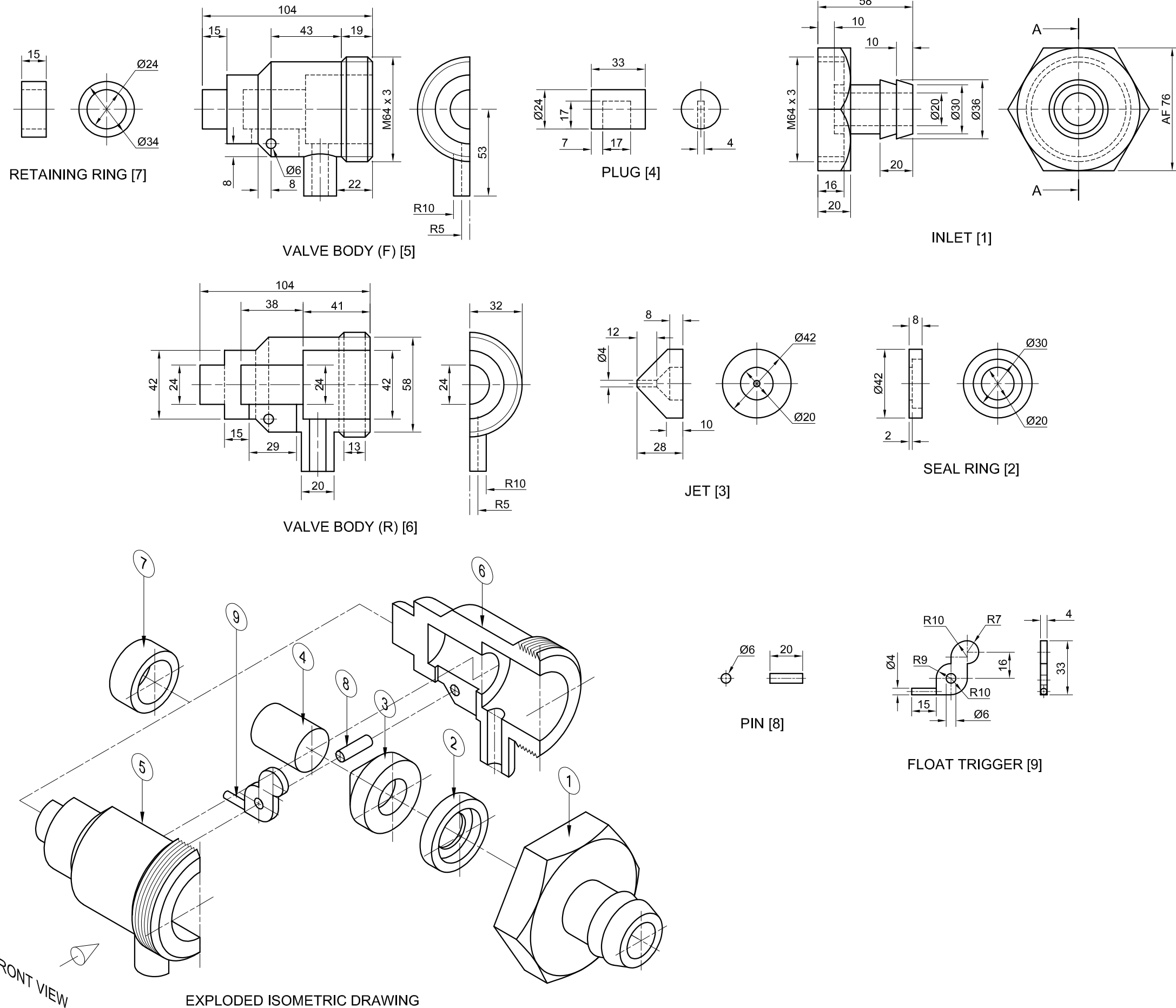
[38]



P ↙

ASSESSMENT CRITERIA			
1	AUX. VIEW + PLACING	3	
2	ISOMETRIC + NON-ISO' LINES	14	
3	ISOMETRIC CIRCLES + CIRCLE CONSTR'	7	
4	SECTIONED SURFACES + HATCHING	14	
PENALTIES			
TOTAL		38	
EXAMINATION NUMBER			
EXAMINATION NUMBER			
EXAMINATION NUMBER			4





QUESTION 4: MECHANICAL ASSEMBLY

Given:

- The exploded isometric drawing of the parts of a float control assembly, showing the position of each part relative to all the others
- Orthographic views of each of the parts of the float control assembly

Instructions:

- Answer this question on page 6.
- Draw, to scale 1 : 1 and in third-angle orthographic projection, the following views of the assembled parts of the float control assembly:
 - 4.1 A sectional front view on cutting plane A-A, as seen from the direction of the arrow shown on the exploded isometric drawing. The cutting plane is shown on the right view of the inlet (part 1).
 - 4.2 The right view
 - 4.3 The bottom view

NOTE:

- Planning is essential.
- ALL drawings must comply with the guidelines as contained in the SANS 10111.
- The convention of symmetry may NOT be applied.
- Show THREE faces of the inlet in the bottom view.
- The plug (part 4) must be placed against the jet (part 3).
- Add cutting plane A-A in the right view.
- NO hidden detail is required. [94]

PARTS LIST			
PART	QUANTITY	MATERIAL	
1	INLET	1	PLASTIC
2	SEAL RING	1	RUBBER
3	JET	1	LTA PLASTIC
4	PLUG	1	PLASTIC
5	VALVE BODY (F)	1	PLASTIC
6	VALVE BODY (R)	1	PLASTIC
7	RETAINING RING	1	PLASTIC
8	PIN	1	PLASTIC
9	FLOAT TRIGGER	1	PLASTIC

TITLE	WR PROJECTS 8 QUARRY STREET DELTA PARK 1807 www.waterproducts.co.za ☎ 012 543 6879		5



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INCORRECT ORTHOGRAPHIC PROJECTION	
INCORRECT OVERALL SCALE	
INCORRECT HATCHING	
PARTS NOT ASSEMBLED	
TOTAL PENALTIES (-)	

ASSESSMENT CRITERIA					
RIGHT VIEW					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	INLET + JET	4			
2	VALVE BODY	2			
SUBTOTAL		6			
SECTIONAL FRONT VIEW					
1	INLET	14 $\frac{1}{2}$			
2	SEAL RING	2			
3	VALVE BODY + RETAINING RING	22			
4	JET	6 $\frac{1}{2}$			
5	FLOAT TRIGGER + PIN + PLUG	9			
SUBTOTAL		54			
BOTTOM VIEW					
1	INLET	9 $\frac{1}{2}$			
2	VALVE BODY + RETAINING RING + JET	9 $\frac{1}{2}$			
SUBTOTAL		19			
GENERAL					
1	CENTRE LINES	4			
2	SECTION A-A	3			
3	ASSEMBLY	8			
SUBTOTAL		15			
TOTAL		94			
PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					
6					

