STAPLE

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION

GRADE 12

2026

ENGINEERING GRAPHICS AND DESIGN

PAPER 2

TIME: 2 ½ hours

MARKS: 100

5 Pages

INSTRUCTIONS AND INFORMATION

1. This question paper consists of THREE 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 surname and name in the given block provided on every page.
10. Any details or dimensions not given must be assumed in good proportion**.**

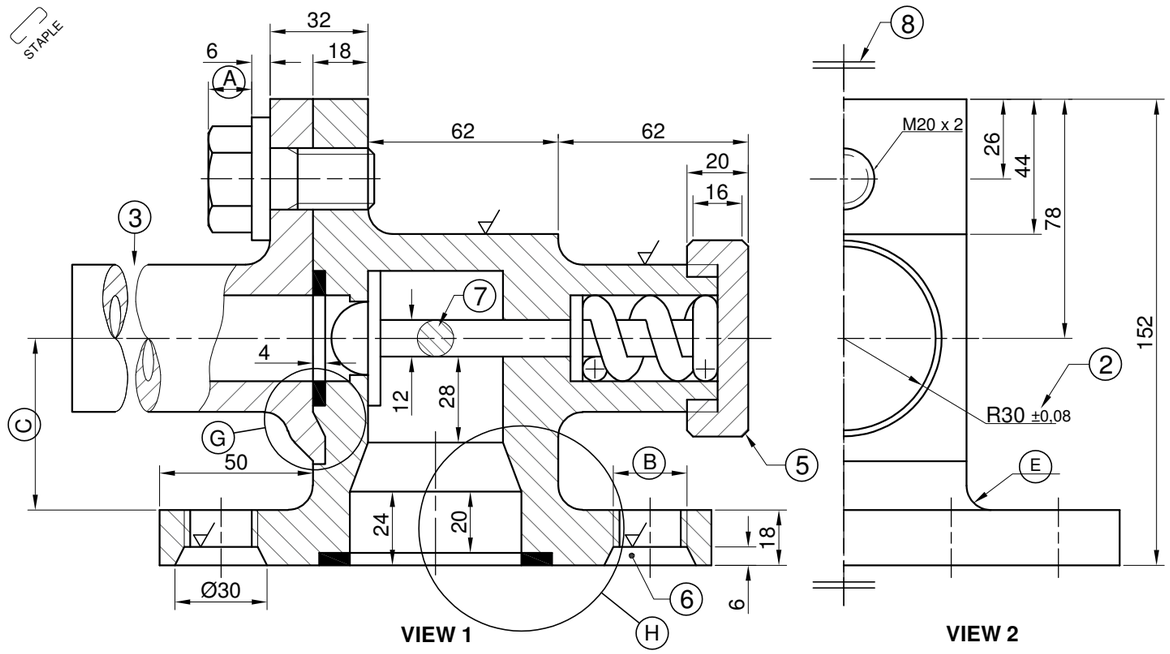
FOR OFFICIAL USE ONLY															
QUESTION	MARKS OBTAINED			½	SIGN	MODERATED			½	SIGN	RE-MARKING			½	SIGN
1															
2															
3															
TOTAL															
	1	6	0			1	6	0			1	6	0		

FINAL CONVERTED MARK	CHECKED BY
100	

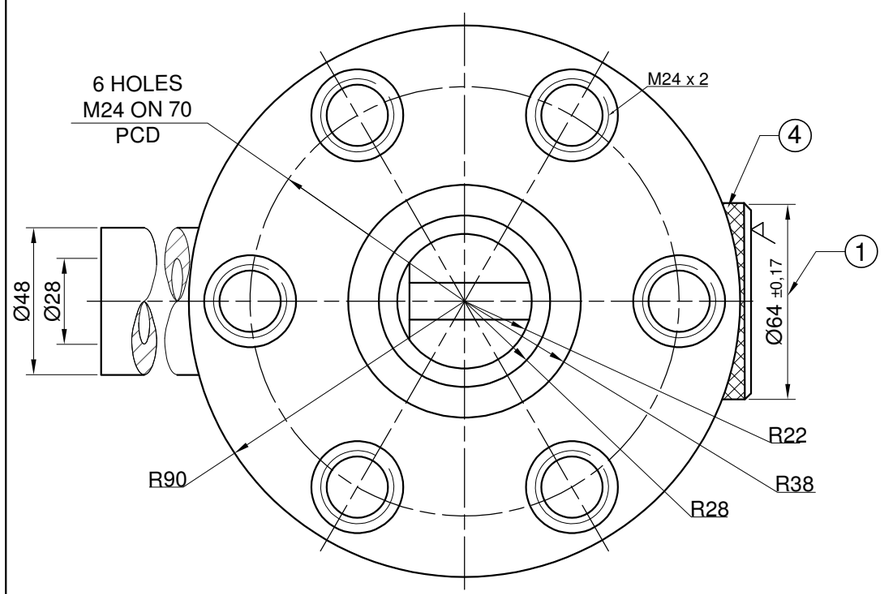
COMPLETE THE FOLLOWING:
SCHOOL'S NAME
SCHOOL'S NAME
SURNAME AND NAME
SURNAME AND NAME

DO NOT FOLD THE QUESTION PAPER IN HALF.

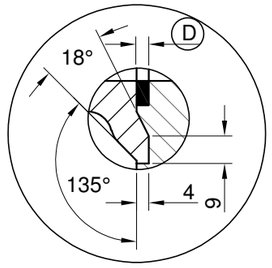
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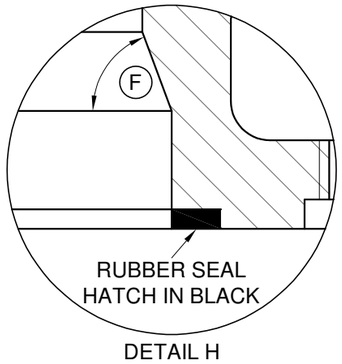
VIEW 1 VIEW 2



VIEW 3



DETAIL G



DETAIL H

QUESTION 1: ANALYTICAL (MECHANICAL)

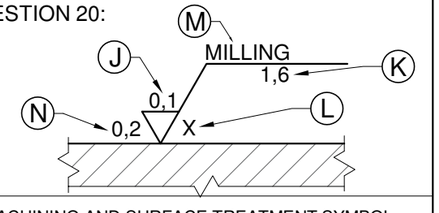
Given:
Three views of a compression pump assembly, two detailed enlargements, a title block and a table of questions. The drawings are not presented to the indicated scale.

Instructions:
Complete the table below by neatly answering the questions, which refer to the accompanying drawings, the title block and mechanical content, in pencil. **[30]**

	QUESTIONS	ANSWERS			
1	What is the file name of the drawing?		1		
2	How many compression pumps must be manufactured?		1		
3	What is the manufacturer's company street number?		1		
4	Who checked the drawing?		1		
5	On what date was the the drawing prepared?		1		
6	What drawing method was used to prepare the drawing?		1		
7	What scale is indicated for the drawing?		1		
8	Determine the complete dimensions at: A: B: C: D: E:		5		
9	Measure the angle at F.		1		
10	What is VIEW 3 called?		1		
11	What type of view is produce by the S-breaks at number 3?		1		
12	With reference to the tolerance, determine the complete maximum dimension at 1. (Show ALL calculations.)		2		
13	With reference to the tolerance, determine the complete minimum dimension at 2. (Show ALL calculations.)		2		
14	What type of finishing is used at number 4?		1		
15	What is the feature called at number 5?		1		
16	What is the feature at number 6 called?		1		
17	What type of section is indicated at 7?		1		
18	What is the feature called if there are double lines on a centre line at number 8?		1		
19	How many parts of one compression pump must be machined?		1		
20	With reference to machining symbol below (QUESTION 20), match the letter on the symbol with the correct label in the column to the right of this question.	DIRECTION OF LAY	1		
		ROUGHNESS VALUE	1		
21	In the space below (ANSWER 21), use the given centre line as the centre of a coil spring and draw, in neat freehand, the *SANS 10111* conventional representation of a coil spring.		3		
		TOTAL	**30**		

QUANTITY: 78	DRAWING NUMBER: 48	ALL TOLERANCES ON DIMENSIONS ARE ± 0,15 UNLESS OTHERWISE SPECIFIED	ALL DIMENSIONS ARE IN MILLIMETRES	2025/06/01	DRAWN: ASHLEIGH
FILE NAME: XK25/13.LC	DRAWING 2 OF 4				
REAL CAST PROJECTS	94 DOUGLAS STREET TZANEEN 0850 www.realcast@web.co.za	ALL UNSPECIFIED RADII ARE R8		2025/11/01	CHECKED: MIGUEL
				2025/01/17	APPROVED: NICKY
TITLE: COMPRESSION PUMP		DRAWING PROGRAM: AUTOCAD 2025	SCALE 3 : 7	DATE	REVISED BY:

QUESTION 20:



MACHINING AND SURFACE TREATMENT SYMBOL

ANSWER 21: CONVENTION OF A COIL SPRING

SURNAME AND NAME	
SURNAME AND NAME	2

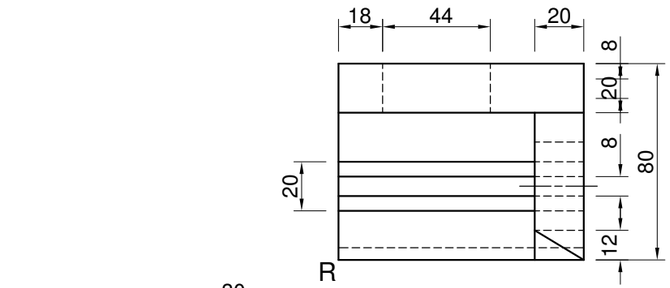
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QUESTION 2: ISOMETRIC DRAWING

Given:
- The front view, top view and left view of a slider
- The position of point R on the drawing sheet

Instructions:
Convert the given orthographic views of this slider and draw a neat isometric drawing to a scale of 1 **:** 1.

- Use point R as the lowest point and starting point for this drawing.
- Show ALL necessary circles and other construction.
- NO hidden detail is required. **[38]**

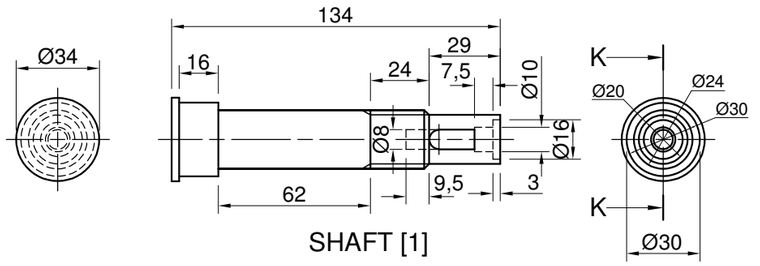


R

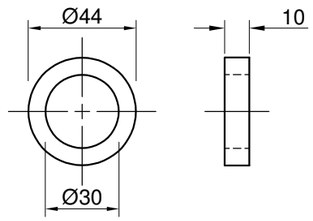
ASSESSMENT CRITERIA					
1	AUX. VIEW AND PLACING	2			
2	BASE	17			
3	LEFT SIDE	6 ½			
4	RIGHT SIDE	5 ½			
5	ISOMETRIC CIRCLES AND CENTRE LINES	7			
PENALTIES (-)					
	TOTAL	**38**			

SURNAME AND NAME	
SURNAME AND NAME	3

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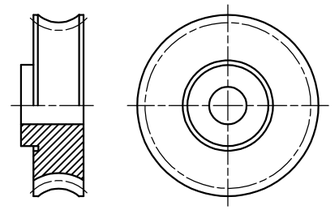


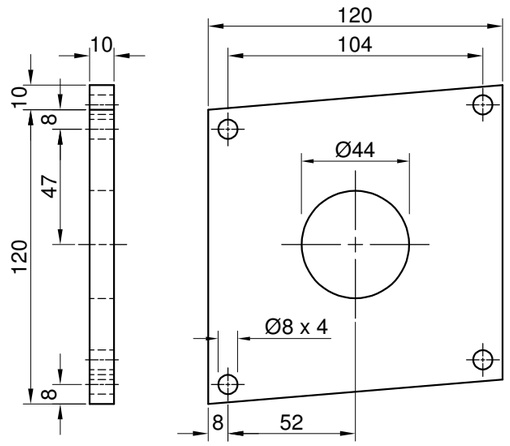
SHAFT [1]



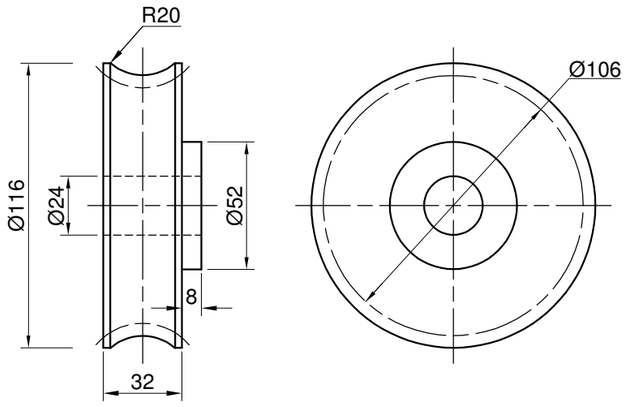
BUSH [2]

AN EXAMPLE OF THE CONVENTIONAL REPRESENTATION OF A WORM WHEEL

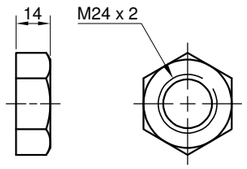




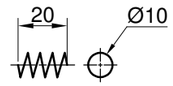
BACKPLATE [3]



WORM WHEEL [4]



M24 NUT [7]



SPRING [8]

QUESTION 3: MECHANICAL ASSEMBLY

Given:

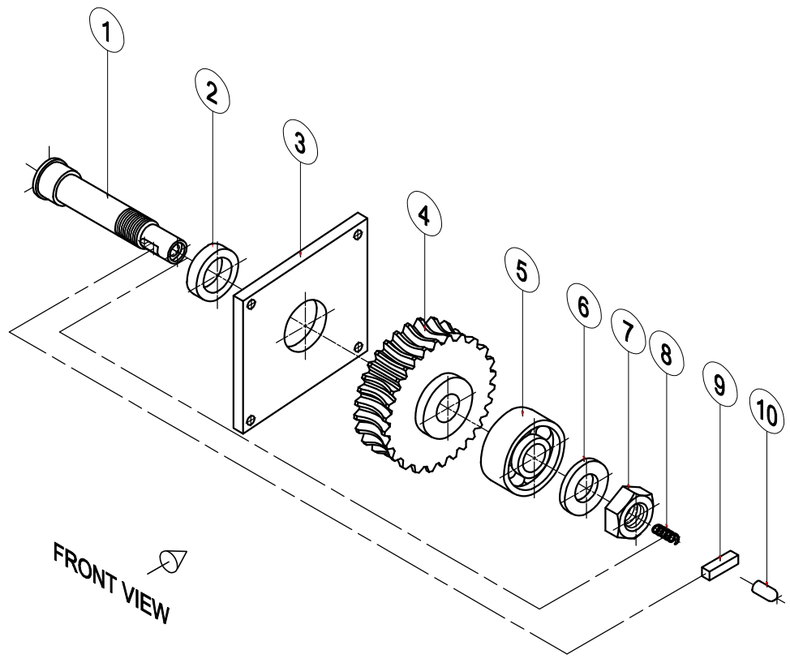
- The exploded isometric drawing of the parts of a **drive shaft assembly**, showing the position of each part relative to all the others
- Orthographic views of each of the parts of the **drive shaft assembly**

Instructions:

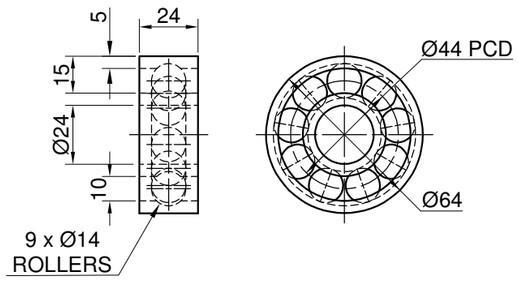
- Answer this question on page 5.
- Draw, to scale 1 : 1 and in third-angle orthographic projection, the following views of the assembled parts of the pulley assembly:
  - **3.1 A sectional front view** on cutting plane K-K, as seen from the direction of the arrow in the exploded isometric drawing. The cutting plane is shown on the right view of the shaft (part 1).
  - **3.2 A right view.**

NOTE:

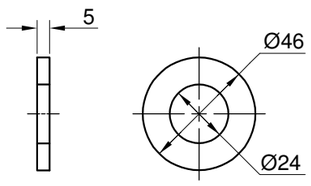
- Planning is essential.
- The drawing must comply with the *SANS 10111* guidelines.
- Show THREE faces of the M24 nut (part 1) on the sectional view.
- Do not use the rule of symmetry in the answer.
- ONLY the spring (part 8) must be drawn in convention and in neat freehand.
- The shaft does not have to be partially sectioned to show the pin detail.
- NO hidden detail is required. **[92]**



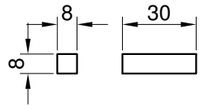
EXPLODED ISOMETRIC DRAWING



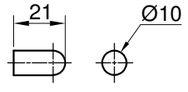
BEARING [5]



SPACER [6]



LOCK KEY[9]



PIN [10]

PARTS LIST

	PARTS	QUANTITY	MATERIAL
1.	SHAFT	1	MILD STEEL
2.	BUSH	1	BRASS
3.	BACKPLATE	1	PLASTIC
4.	WORM WHEEL	1	STAINLESS STEEL
5.	BEARING	1	TOOL STEEL
6.	SPACER	1	MILD STEEL
7.	M24 NUT	1	TOOL STEEL
8.	SPRING	1	SPRINGSTEEL
9.	LOCK KEY	1	HARDENED STEEL
10.	PIN	1	HARDENED STEEL

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DRIVE SHAFT ASSEMBLY

ALL DIMENSIONS ARE IN MILLIMETRES
ALL UNSPECIFIED RADII ARE R4

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FOR OFFICIAL USE ONLY	
INCORRECT ORTHOGRAPHIC PROJECTION	
INCORRECT OVERALL SCALE	
INCORRECT HATCHING	
PARTS NOT ASSEMBLED	
TOTAL PENALTIES (-)	

ASSESSMENT CRITERIA					
RIGHT VIEW					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	BACKPLATE + WORM WHEEL	6			
2	BEARING + SPACER	11			
3	M24 NUT	2 ½			
3	SHAFT + PIN + LOCK KEY	6			
SUBTOTAL		**25 ½**			
HALF SECTION FRONT VIEW					
1	BACK PLATE	5			
2	BUSH	2			
3	SHAFT	12 ½			
4	WORM WHEEL	9			
5	BEARING	9 ½			
6	M24 NUT + WASHER	5 ½			
7	KEY + SPRING	1 ½			
8	PIN	1 ½			
SUBTOTAL		**46 ½**			
GENERAL					
1	CENTRE LINES	4			
2	ASSEMBLY	9			
3	SECTION P-P	7			
SUBTOTAL		**20**			
TOTAL		**92**			
PENALTIES (-)					
GRAND TOTAL					

SURNAME AND NAME	
SURNAME AND NAME	5