STAPLE

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

JUNE EXAMINATION
GRADE 12
2024

ENGINEERING GRAPHICS AND DESIGN
PAPER 2
2024

TIME: 2 ½ hours
MARKS: 100

ENGINEERING GRAPHICS & DESIGN P2

C2772E

This question paper consists of 5 pages.

X05

INSTRUCTIONS AND INFORMATION

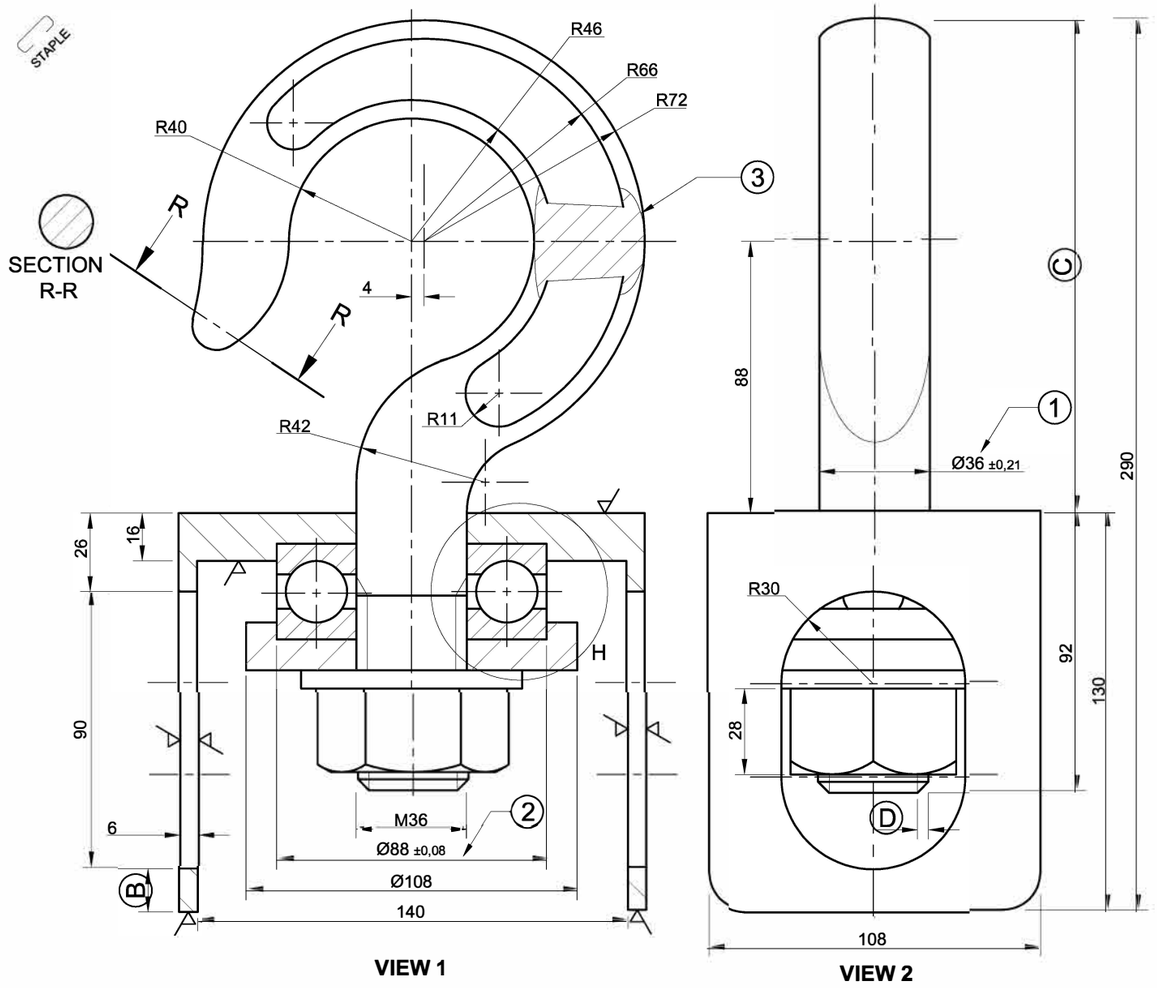
1. This question paper consists of THREE questions.
2. Answer ALL the questions.
3. ALL drawings are in third-angle orthographic projection, unless otherwise stated.
4. ALL drawings must be prepared using pencil and instruments, unless otherwise stated.
5. ALL answers must be drawn accurately and neatly.
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	

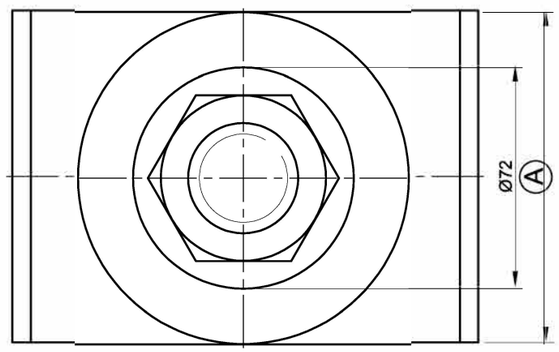
COMPLETE THE FOLLOWING:
SCHOOL'S NAME
SCHOOL'S NAME
SURNAME AND NAME
SURNAME AND NAME

DO NOT FOLD THE QUESTION PAPER IN HALF.

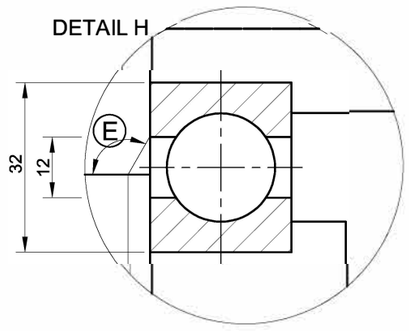


VIEW 1

VIEW 2



VIEW 3



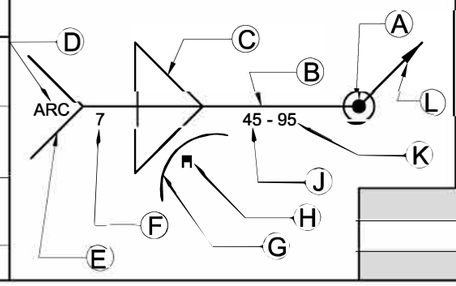
QUESTION 1: ANALYTICAL (MECHANICAL)

Given:
Three views of a swivel hook assembly, a detailed enlargement, 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 swivel hooks must be manufactured?		1		
3	What is the manufacturer's website address?		1		
4	What must all unspecified radii be?		1		
5	What heat treatment must be applied?		1		
6	What drawing method was used to prepare the drawing?		1		
7	What scale is indicated for the drawing?		1		
8	Who checked the drawing?		1		
9	What was changed in the second revision?		1		
10	Determine the complete dimensions at: A: B: C: D:		5		
11	What is the size of angle at E?		1		
12	What is VIEW 3 called?		1		
13	With reference to the tolerance, determine the complete maximum dimension at 1. (show all calculations)		2		
14	With reference to the tolerance, determine the complete minimum dimension at 2. (show all calculations)		2		
15	How many surfaces of the swivel hook assembly must be machined?		1		
16	What type of section is indicated at 3?		1		
17	What type of section is indicated by SECTION R-R?		1		
18	With reference to the welding symbol below (QUESTION 18), match the letter on the welding symbol with the correct label in the column to the right of this question.	WELD PROCESS	1		
		WELD LENGTH	1		
		CONTOUR SYMBOL	1		
		SITE-WELD	1		
19	In the space below (ANSWER 19), use the given centre line as the centre of the bearing and draw, in neat freehand, the *SANS 10111* conventional representation of a bearing.		3		
		TOTAL	**30**		

QUESTION 18: WELDING SYMBOL



ANSWER 19: CONVENTION OF A BEARING

SURNAME AND NAME

SURNAME AND NAME 2

QUANTITY: 600	MATERIAL: MILD STEEL	ALL TOLERANCES ON DIMENSIONS ARE ± 0,15 UNLESS OTHERWISE SPECIFIED	DRAWN: RUAN DATE: 03 / 01 / 2024	15 / 01 / 2024	WILLEM	ADD MORE DIMENSIONS 3
FILE NAME: J24/62.LC	HEAT TREATMENT: NONE		CHECKED: KAREL DATE: 07 / 01 / 2024	15 / 01 / 2024	BERENT	INSERT BALL BEARING 2
SA HOOKS PROJECTS	31 AUGUST STREET ROBERTSON 6704 www.hooks@web.co.za	ALL UNSPECIFIED RADII ARE R12	APPROVED: WILLIE DATE: 17 / 01 / 2024	14 / 01 / 2024	BERNIES	USE STANDARD SCREW THREAD 1
TITLE: SWIVEL HOOK ASSEMBLY		DRAWING PROGRAM: AUTOCAD 2024	SCALE 1 : 3	DATE	REVISED BY:	REVISION DESCRIPTION No.

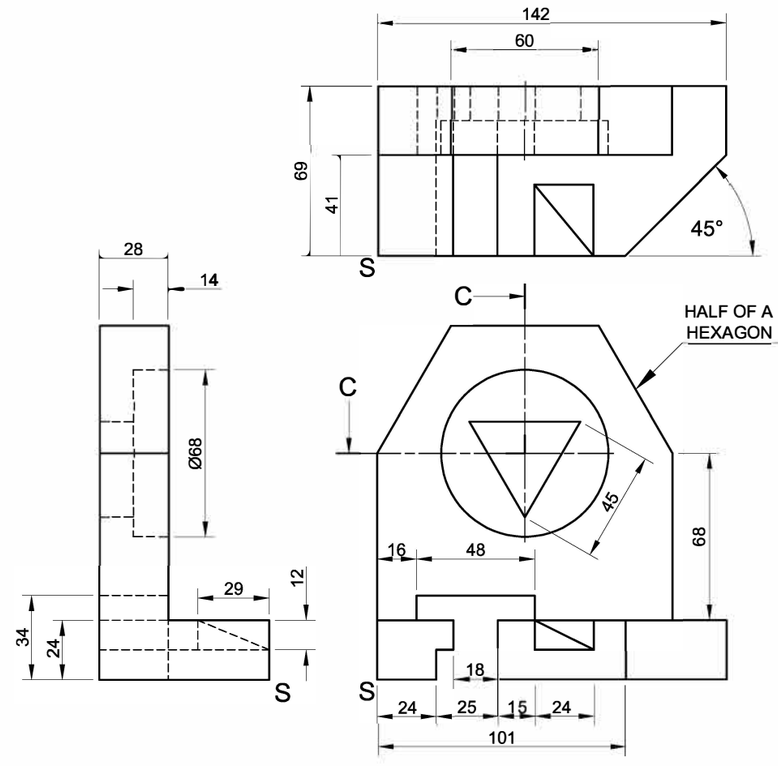
STAPLE

QUESTION 2: ISOMETRIC DRAWING

Given:
- The front view, top view and left view of a GUIDE.
- The position of point S on the drawing sheet

Instructions:
Using scale of 1 : 1, convert the given orthographic views of this GUIDE into a sectional isometric drawing on cutting plane C-C.

- Use point S as the starting and lowest point for this drawing.
- Show ALL construction.
- NO hidden detail is required. **[39]**



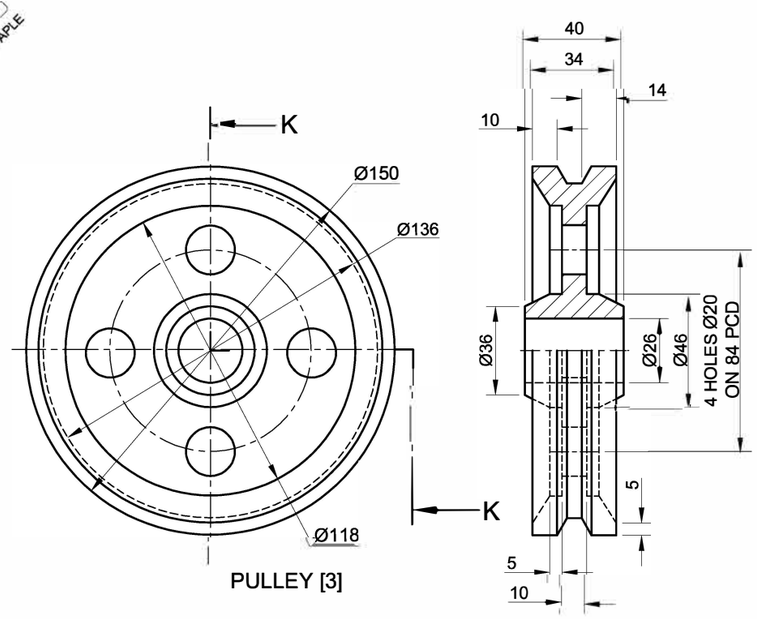
S

ASSESSMENT CRITERIA					
1	AUX. VIEW AND PLACING	3			
2	BASE	13 ½			
3	UPRIGHT	8 ½			
4	SECTION AND HATCHING	7			
5	ISOMETRIC CIRCLES AND CENTRE LINES	7			
PENALTIES (-)					
	TOTAL	**39**			

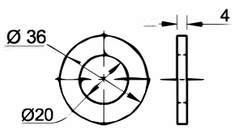
SURNAME AND NAME

SURNAME AND NAME 3

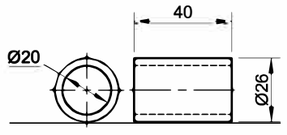
STAPLE



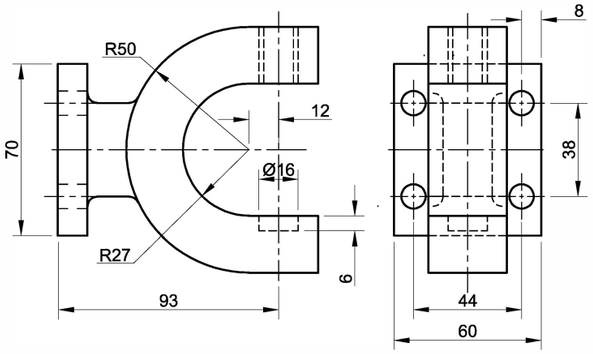
PULLEY [3]



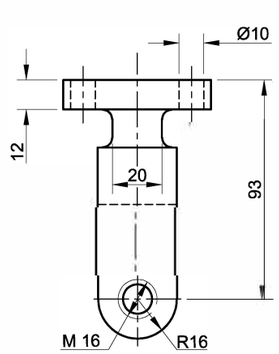
WASHER [2]

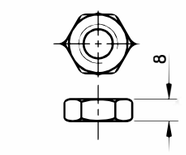


BUSH [4]

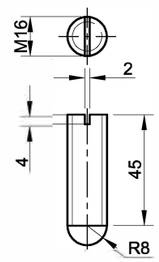


SWIVEL ARM [5]

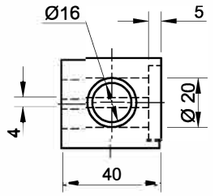


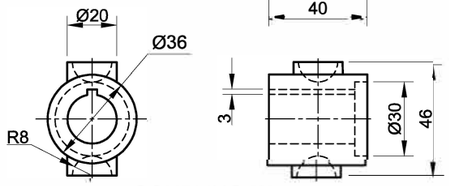


M16 LOCK NUT [6]

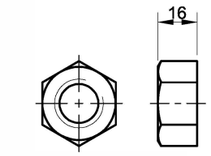


GRUB SCREW [7]



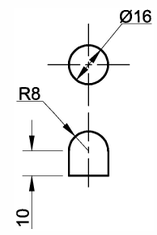


COUPLING [8]

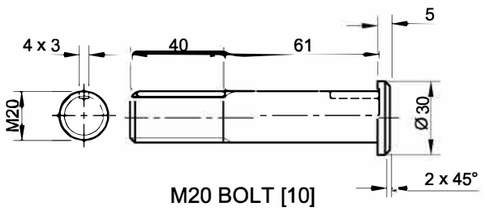


M20 NUT [1]

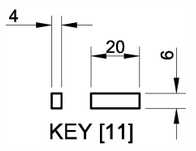
EXPLODED ISOMETRIC DRAWING



GRUB SPACER [9]



M20 BOLT [10]



KEY [11]

QUESTION 3: MECHANICAL ASSEMBLY

Given:

- The exploded isometric drawing of the parts of a **pulley assembly**, showing the position of each part relative to all the others
- Orthographic views of each of the parts of the **pulley 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 half sectional front view** on cutting plane K-K. Show the top half in section, as seen from the direction of the arrow in the exploded isometric drawing. The cutting plane is shown on the left view of the pulley (part 3).
  - **3.2 The left view.**

NOTE:

- Planning is essential.
- The drawing must comply with the *SANS 10111* guidelines.
- The convention of symmetry may NOT be applied.
- Show THREE faces of the M20 nut (part 1) on the half sectional front view.
- Show TWO faces of the M16 lock nut (part 6) on the half sectional front view..
- NO hidden detail is required. **[91]**

LIST OF PARTS

	PART	QUANTITY	MATERIAL
1.	M20 NUT	1	MILD STEEL
2.	WASHER	1	MILD STEEL
3.	PULLEY	1	MILD STEEL
4.	BUSH	1	BRASS
5.	SWIVEL ARM	1	MILD STEEL
6.	M16 LOCK NUT	1	MILD STEEL
7.	GRUB SCREW	1	MILD STEEL
8.	COUPLING	1	MILD STEEL
9.	GRUB SPACER	1	BRASS
10	M20 BOLT	1	MILD STEEL
11.	KEY	1	HARDENED STEEL

KOMANI PROJECTS CC
88 KLIPPLAAT STREET
KOMANI
5320
www.komaniprojects.co.za
☎ 031 818 0357

PULLEY ASSEMBLY

ALL DIMENSIONS ARE IN MILLIMETRES.
ALL UNSPECIFIED RADII ARE R4.

Please turn over

STAPLE

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

ASSESSMENT CRITERIA					
LEFT VIEW					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	SWIVEL ARM	5			
2	PULLEY	$4\frac{1}{2}$			
3	M20 NUT, BOLT AND WASHER	$4\frac{1}{2}$			
SUBTOTAL		**14**			
HALF SECTION FRONT VIEW					
1	SWIVEL ARM	10			
2	COUPLING	6			
3	PULLEY	20			
4	BUSH	1			
5	GRUB SCREW AND SPACER	$8\frac{1}{2}$			
6	M16 LOCK NUT	3			
7	KEY	3			
8	M20 BOLT	$6\frac{1}{2}$			
9	M20 NUT AND WASHER	5			
SUBTOTAL		**63**			
GENERAL					
1	CENTRE LINES	4			
2	ASSEMBLY	10			
SUBTOTAL		**14**			
TOTAL		**91**			
PENALTIES (-)					
GRAND TOTAL					

SURNAME AND NAME	
SURNAME AND NAME	5