STAPEL

education

Department of Education
FREE STATE PROVINCE

PROVINCIAL PAPER

GRADE 12

ENGINEERING GRAPHICS AND DESIGN
PAPER 2

JUNE 2019

MARKS: 100
TIME: 3 HOURS

This paper consists of 6 pages.

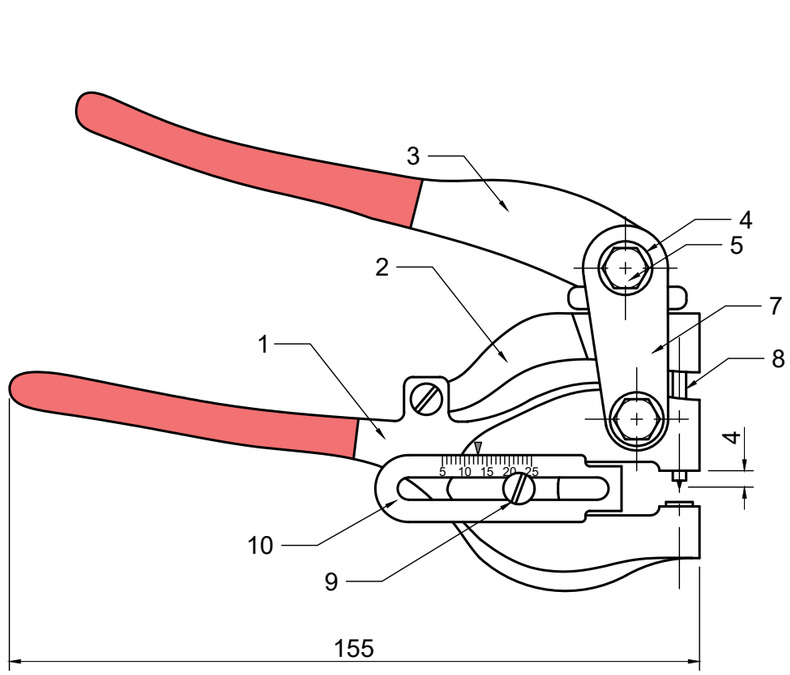
INSTRUCTIONS AND INFORMATION

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. ALL drawings are in third angle orthographic projection, unless stated otherwise.
4. ALL drawings must be drawn to scale 1:1, unless stated otherwise.
5. ALL questions must be answered on the DIAGRAM SHEETS, as instructed.
6. ALL the pages must be restapled in numerical 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.

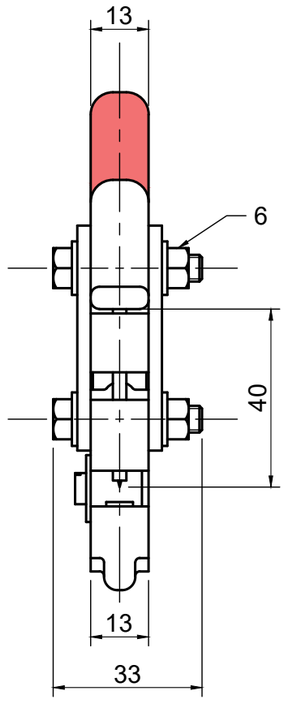
FOR OFFICIAL USE ONLY								
QUESTION	MARKS OBTAINED			½	MODERATED			½
1								
2								
3								
4								
TOTAL								
	1	6	0		1	6	0	

FINAL CONVERTED MARK	CHECKED BY
$\frac{}{100}$	

NAME & SURNAME	MEMORANDUM	GRADE	12	1



VIEW 1



VIEW 2

QUESTION 1: ANALYTICAL (MECHANICAL)

Given:
The working drawings of a mono punch with a title block and a table of questions.

Instructions:
With a pencil, complete the table by neatly printing the correct answers in the corresponding answer column. All the questions refer to the accompanying drawings and the title block on diagram sheet 1. **[16]**

QUESTIONS		ANSWERS			
1	On which date is this drawing approved?	2019/03/01	1		
2	What is the manufacturing company`s name?	Ntima Ingenieurswerke	1		
3	What treatment process must be used on the mono punch device?	Galvanizing	1		
4	What is the drawing file name?	ZAP 13-PQR-350	1		
5	How many mono punch devices should be manufactured?	300	1		
6	What will we call view 1?	Front view	1		
7	What size bolt & nut will be used to join the connector plates?	M6	1		
8	What is the thickness of the washers used?	1.2 mm	1		
9	Name the finishing applied on the handles?	Non slip rubber coating	1		
10	What is the reason for the finishing?	For better grip / to prevent slip	1		
11	On what distance is the depth indicator set?	8mm	1		
12	How many adjusting screws is attached on each unit?	2	1		
13	What is die diameter of the holes which will be punched with the punch pin?	3 mm	1		
14	What is total length of the punch pin?	40 mm	1		
15	Who approved the drawing?	EK MPAPA	1		
16	How many parts make up the mono punch?	17	1		
	TOTAAL		16		

PART LIST		
ITEM	DESCRIPTION	TOTAL
1	PUNCH JAW	1
2	CLAMP	1
3	CLAMP HANDLE	1
4	WASHER	4
5	M6 BOLT	2
6	M6 NUT	2
7	CONNECTION PLATE	2
8	Ø 3mm PUNCH PIN	1
9	ADJUSTING SCREW	2
10	DEPTH-INDICATOR	1

GENERAL INFORMATION	NON-SLIP RUBBER COATING ON HANDLES		
FILE NAME: ZAP 13-PQR-350	MATERIAL: PEWTER		
DRAWING NUMBER: 14 JVDB CONTRACTORS 17 JANDIRK STREET DURBAN	METAL FINISHING: GALVANIZING	ALL DIMENSIONS ARE IN MILLIMETERS	
	DRAWING SOFTWARE: AUTOCAD 2017	DRAWN BY: M MAHLATSI	2018/05/15
	ALL UNSPECIFIED RADII ARE R3.	REVISED BY: L MOLOI	2018/09/25
NTIMA ENGINEERING WORKS		APPROVED BY: EK MPAPA	2019/03/01
TITLE: MONO PUNCH		P Othole street 55 Sasolburg 1039 www.weich.co.za. Tel No : 089 000 2598	Manufacture 300 devices

DIAGRAM SHEET 1 | ENGINEERING GRAPHICS AND DESIGN | JUNE 2019 - PAPER 2 | NAME & SURNAME | MEMORANDUM | GRADE 12 | 2

Please turn page over for next question

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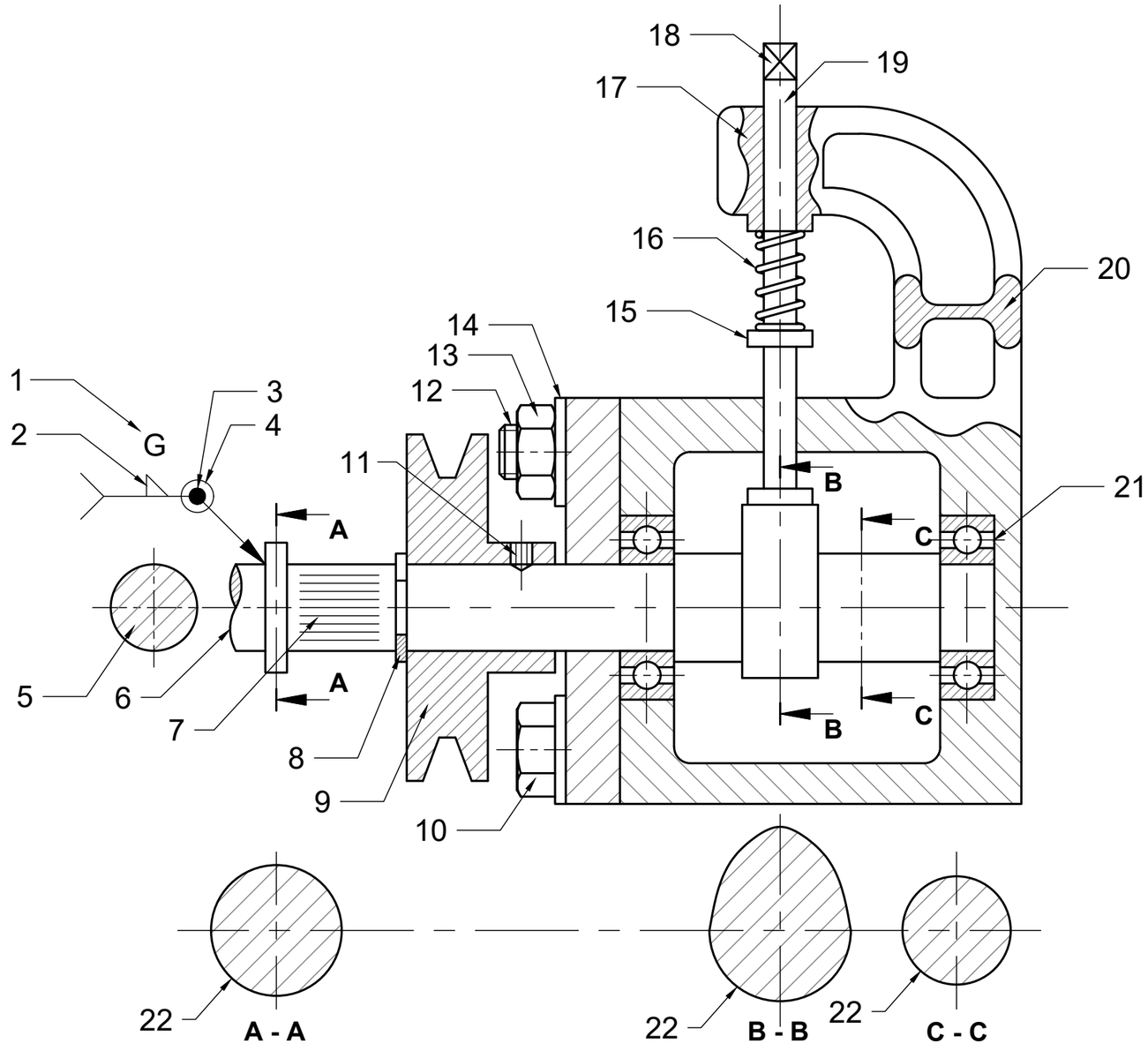


QUESTION 2: SANS 10111 SYMBOLS

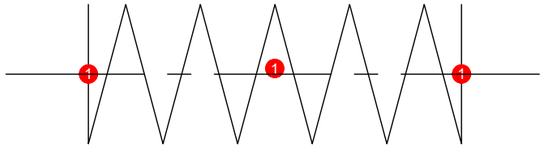
Given:
A front view of a cam driver system and a table with questions.

Instructions:
Complete the table by writing the number of the feature describing the part best. **[24]**

QUESTIONS		ANSWERS			
1	Weld-all-round	4	1		
2	Pulley	9	1		
3	Grip screw	11	1		
4	Use grinder for finishing	1	1		
5	Bolt	10	1		
6	Removed sectioning	5	1		
7	Washer	14	1		
8	Stud	12	1		
9	Field weld (on site)	3	1		
10	Fillet weld on the other side	2	1		
11	Parallel knurling	7	1		
12	Revolved sectioning	20	1		
13	Interrupted view	6	1		
14	Shoulder on shaft	15	1		
15	Circlip	8	1		
16	A nut	13	1		
17	Successive sectioning	22	1		
18	Partly sectioned	17	1		
19	A rod	19	1		
20	Square end on shaft	18	1		
21	Draw, free hand, in the space provided the conventional symbol for a spring.		2		
22	Draw, free hand, in the space provided the conventional symbol for a bearing.		2		
		TOTAL	24		

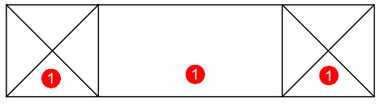
ANSWER 21

1 FREE HAND



ANSWER 22

1 FREE HAND



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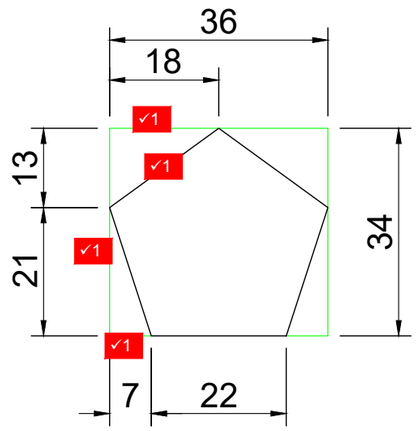
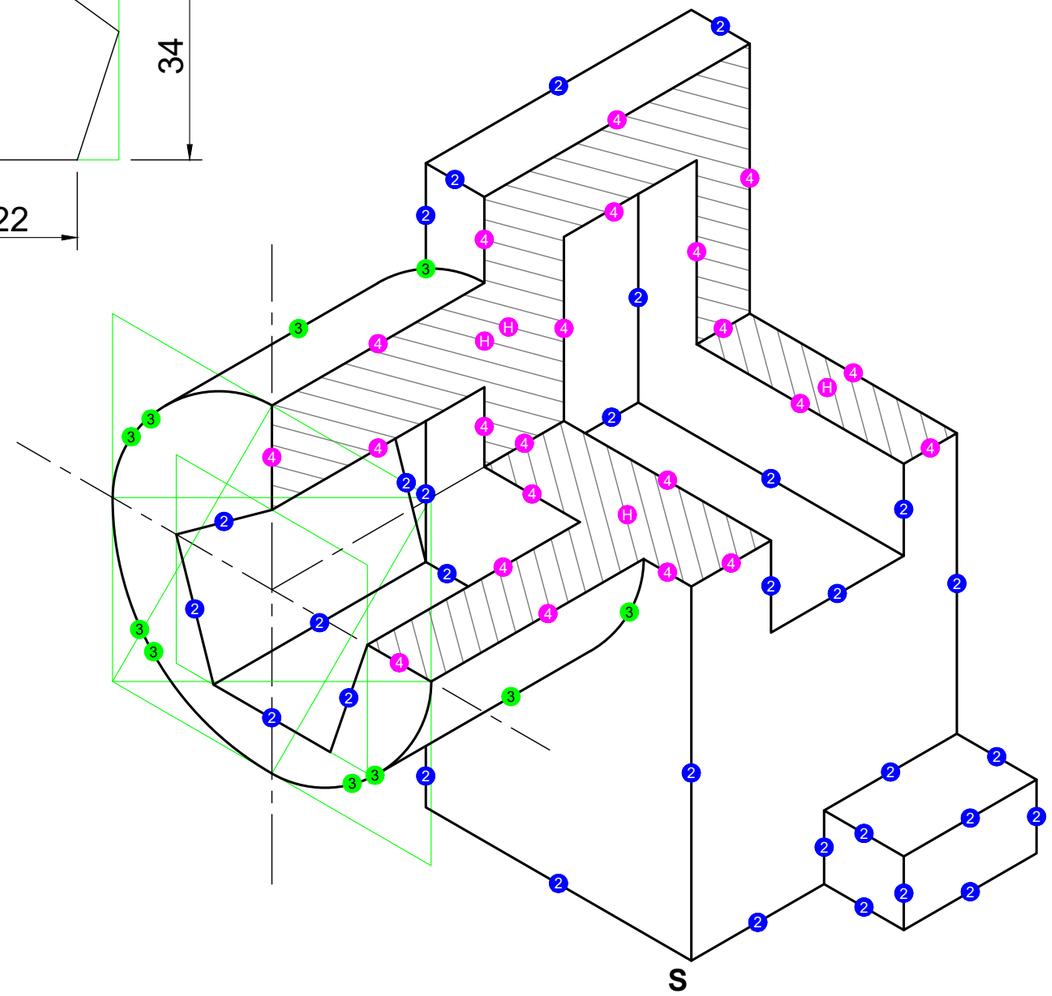


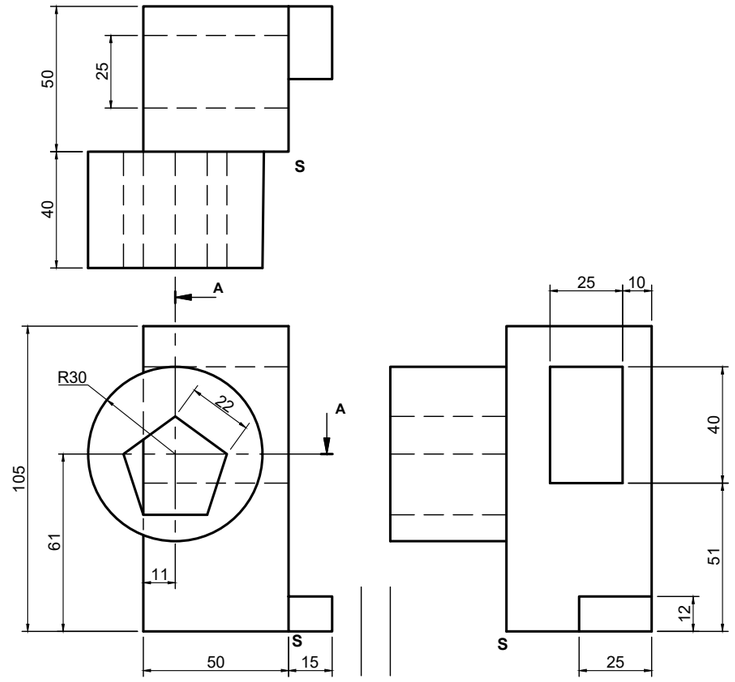


QUESTION 3: ISOMETRIC DRAWING

Given:
The front view, top view and right view of a casting.
The position of point S on the diagram sheet 3 (page 4).

Instructions:
Use a scale of 1:1 to convert the orthographic views of the casting into a sectional isometric drawing on cutting plane A-A.

- Make S the lowest point of the drawing.
- Show ALL necessary constructions.
- NO hidden detail is required. **[38]**



FOR OFFICIAL PURPOSES	Max	Mark
Wrong placement	-1	
Hatching spacing incorrect	-1	
Hatching angle incorrect	-1	
PENALTY TOTAL		

ASSESSMENT CRITERIA					
1	AUXILIARY VIEW ✓1		4		
2	ISO & NON-ISO LINES ($\frac{32}{2}$) 2		16		
3	ISOMETRIC CIRCLE ($\frac{10}{2}$) ✓3 3		5		
4	SECTIONING & HATCHING ($\frac{26}{2}$) 4 H		13		
5	PENALTIES				
TOTAL			38		

DIAGRAM SHEET 3	ENGINEERING GRAPHICS AND DESIGN	JUNE 2019 - PAPER 2	NAME & SURNAME	MEMORANDUM	GRADE	12	4

Please turn page over for next question

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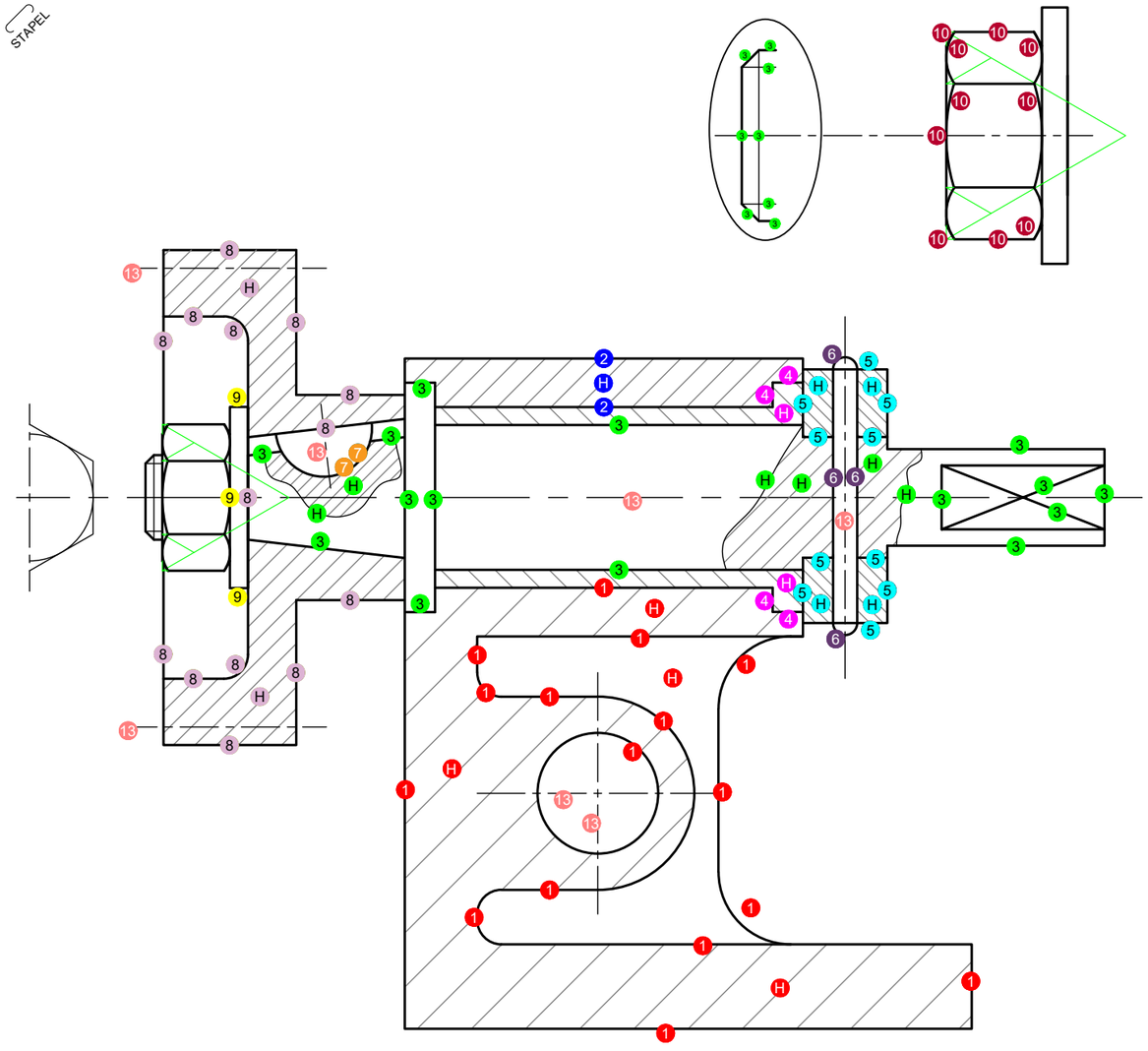
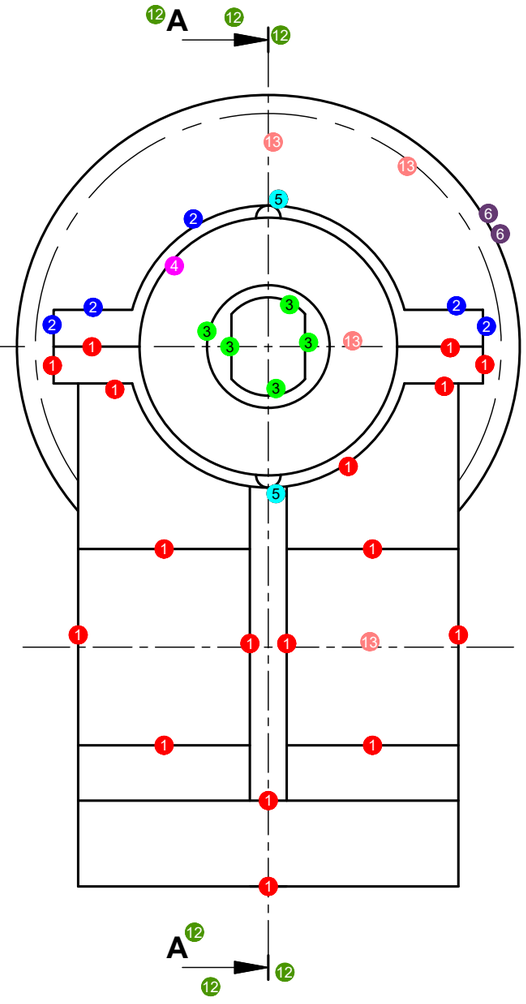


SECTIONED FRONT VIEW ON AA ✓11



ASSESSMENT CRITERIA				
SECTIONAL FRONT VIEW				
1	STAND ($\frac{20}{2}$)	10		
2	BEARING CAP ($\frac{3}{2}$)	1.5		
3	SPINDLE ($\frac{29}{2}$)	14.5		
4	BUSH ($\frac{6}{2}$)	3		
5	COLLAR ($\frac{14}{2}$)	7		
6	PIN ($\frac{4}{2}$)	2		
7	KEY ($\frac{2}{2}$)	1		
8	SPUR ($\frac{16}{2}$)	8		
9	WASHER ($\frac{3}{2}$)	1.5		
10	M14 NUT ($\frac{10}{2}$)	5		
	SUB TOTAL 1	53.5		
RIGHT VIEW				
1	STAND ($\frac{17}{2}$)	8.5		
2	BEARING CAP ($\frac{5}{2}$)	2.5		
3	SPINDLE ($\frac{5}{2}$)	2.5		
4	COLLAR ($\frac{1}{2}$)	0.5		
5	PIN ($\frac{2}{2}$)	1		
6	SPUR ($\frac{2}{2}$)	1		
	SUB TOTAL 2	16		
TECHNICAL COMPLIANCY				
1	TITLE & SCALE	2		
2	PROJ. SYMBOL	3		
3	LABEL SECTION	1		
4	SECTION LINE ($\frac{6}{2}$)	3		
	CENTER LINES	3.5		
	SUB TOTAL 3	12.5		
	PENALTIES			
	GRAND TOTAL	82		

TITLE & SCALE	PROJECTION SYMBOL
✓11 GEAR SUB-ASSEMBLY ✓11 SCALE 1:1	✓11 ✓11 ✓11

CENTRE LINES	
SPUR FRONT VIEW ($\frac{2}{2}$)	1
SPUR RIGHT VIEW ($\frac{1}{2}$)	0.5
0 CENTRE LINES (0)	2
0 - 4 CENTRE LINES (MAX 1 MARK)	
5 - 8 CENTRE LINES (MAX 2 MARKS)	

FOR OFFICIAL USE ONLY	Max	Mark
Incorrect Orthographic projection	-1	
Incorrect overall scale	-1	
Incorrect hatching	-1	
Parts not assembled	-1	
PENALTY TOTAL (-)		

DIAGRAM SHEET 5	ENGINEERING GRAPHICS AND DESIGN	JUNE 2019 - PAPER 2	NAME & SURNAME	MEMORANDUM	GRADE	12	6