

**ISEBE LEMFUNDO LEMPUMA KOLONI
EASTERN CAPE EDUCATION DEPARTMENT
OOS-KAAP ONDERWYSDEPARTEMENT**

NATIONAL SENIOR CERTIFICATE

GRADE 12

ENGINEERING GRAPHICS AND DESIGN P2

SEPTEMBER 2026

**PREPARATORY EXAMINATION
MARKING GUIDELINE**

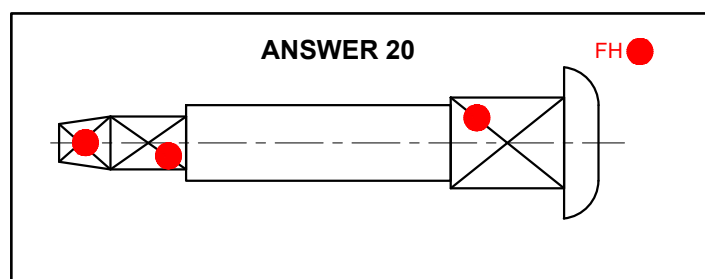
MARKS: 200

This marking guideline consists of 7 pages.

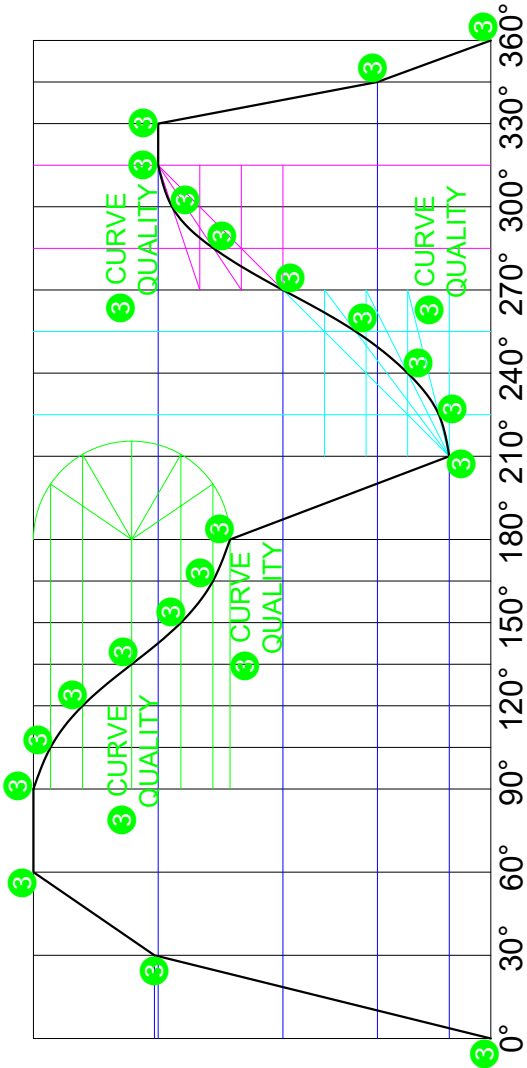
Copyright reserved

QUESTION 1: ANALYTICAL (MECHANICAL)

ANSWERS		
1	2026/02/21	1
2	AIRCRAFT BRACKET	1
3	CAD	1
4	30 000	1
5	HARDENING	1
6	$\pm 0,25$	1
7	CUTTING PLANE	1
8	RIGHT VIEW	2
9	COUNTERSINK	1
10	MULTIPLANE / OFFSET / STAGGERED	1
11	SUCCESSIVE	2
12	$B = 60^\circ$, $C = 200 \text{ mm}$, $D = 3 \text{ mm}$, $E = 29 \text{ mm}$	4
13	WEB / RIB	1
14	DEPTH	1
15	CENTERS	1
16	$8 \times 0,1 = 0,8 \text{ mm}$	1
17	ATTACHMENT SURFACE FOR FASTENERS	2
18	NO MACHINING REQUIRED	1
19	$48 - 0,15 = 47,85 \text{ mm}$	2
20	SEE BELOW	2
TOTAL		28



QUESTION 2: LOCI (CAM)



2. CONSTRUCTION OF DIAGRAM

- BASE LENGTH 132 mm 0,5
- 12 DIVISIONS 0,5

UNIFORM ACCELERATION + RETARDATION

- HEIGHT DIVISION 0,5
- FIRST HALF CONSTRUCTION 0,5
- SECOND HALF CONSTRUCTION 0,5
- 15° SUBDIVISIONS 0,5

SIMPLE HARMONIC MOTION

- SEMI CIRCLE 0,5
- CIRCLE DIVISION 0,5
- 15° SUBDIVISION 0,5
- PROJECTION 0,5

TOTAL 5

ASSESSMENT CRITERIA	
1	GIVEN + MINIMUM DISTANCE + CL 4½
2	GRAPH CONSTRUCTION 5
3	DISPLACEMENT GRAPH 13
4	CAM CONSTRUCTION 4
5	CAM PROFILE + CURVE QUALITY 12
TOTAL 38½	

1

2

3

4

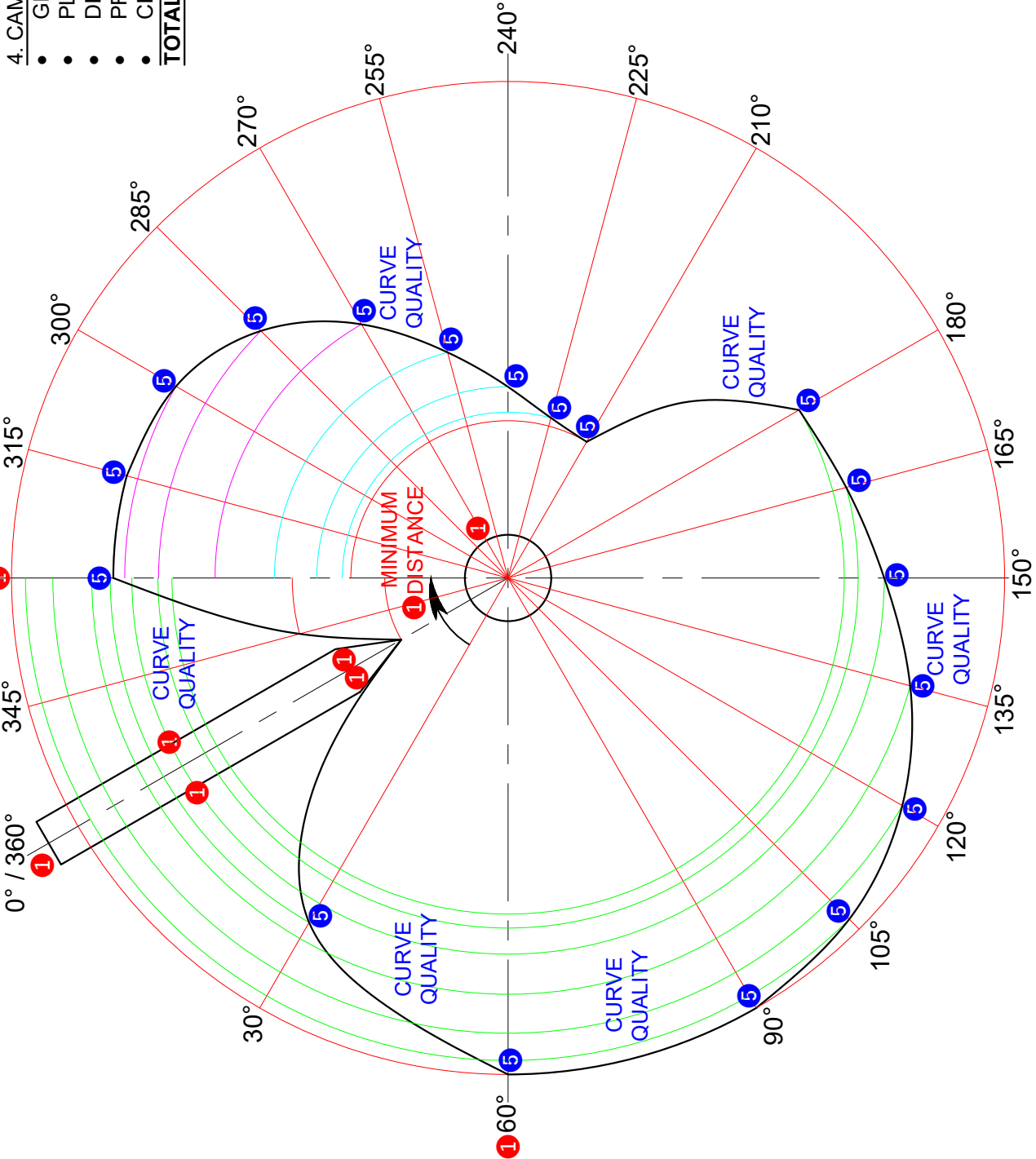
5

DISPLACEMENT GRAPH
SCALE 360° = 132 mm

TOTAL

330°QUESTION 2: LOCI (CAM)

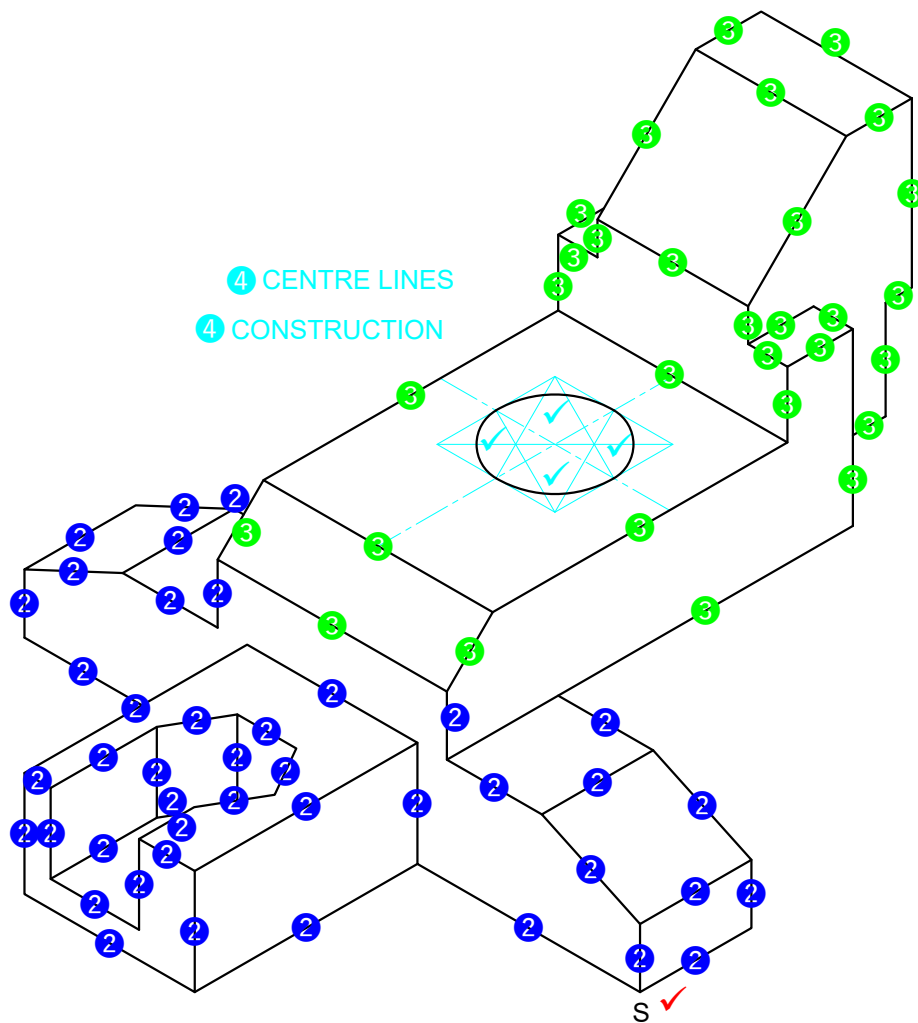
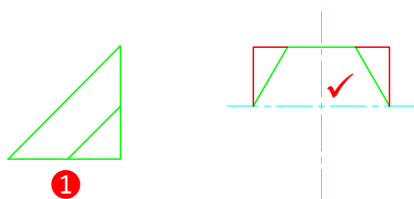
4. CAM CONSTRUCTION
- GIVEN POSITION EQUALS 0° 0,5
 - PLOT DIRECTION CLOCKWISE 1
 - DIRECTION INDICATION BY ARROW 0,5
 - PROJECTION / TRANSFER FROM GRAPH 1
 - CIRCLE DIVISION 1
- | | |
|-------|---|
| TOTAL | 4 |
|-------|---|



ASSESSMENT CRITERIA	
1	GIVEN + MINIMUM DISTANCE + CL 4½
2	GRAPH CONSTRUCTION 5
3	DISPLACEMENT GRAPH 13
4	CAM CONSTRUCTION 4
5	CAM PROFILE + CURVE QUALITY 12
TOTAL 38½	

- 1 2 3 4 5

QUESTION 3: ISOMETRIC



ASSESSMENT CRITERIA		
1	AUX VIEW+ PLACEMENT	2 $\frac{1}{2}$
2	LOWER PORTION	21 $\frac{1}{2}$
3	UPPER PORION	15
4	CIRCLE + CL'S	5
TOTAL		44

1 ✓

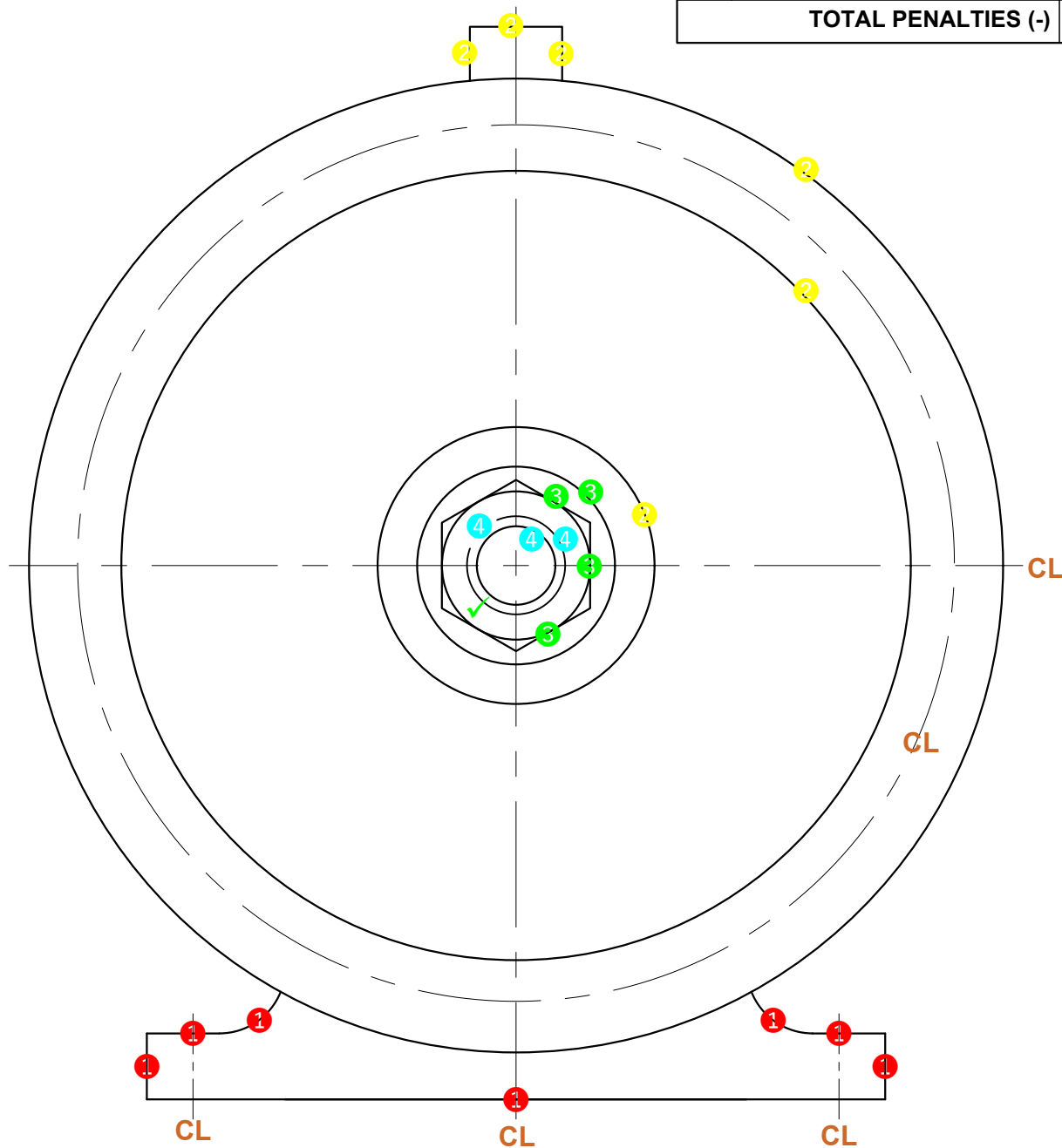
2

3

4 ✓

QUESTION 4: MECHANICAL ASSEMBLY

PENALTIES		
1	WRONG SCALE	-2
2	PARTS NOT ASSEMBLED (-1 PER PART)	-10
3	WRONG HATCHING	-2
TOTAL PENALTIES (-)		



RIGHT VIEW		
1	1 HOUSING	$3\frac{1}{2}$
2	2 PIN AND SPUR GEAR	3
3	3 WASHER AND NUT	3
4	4 SHAFT	$1\frac{1}{2}$
SUB-TOTAL		11

6

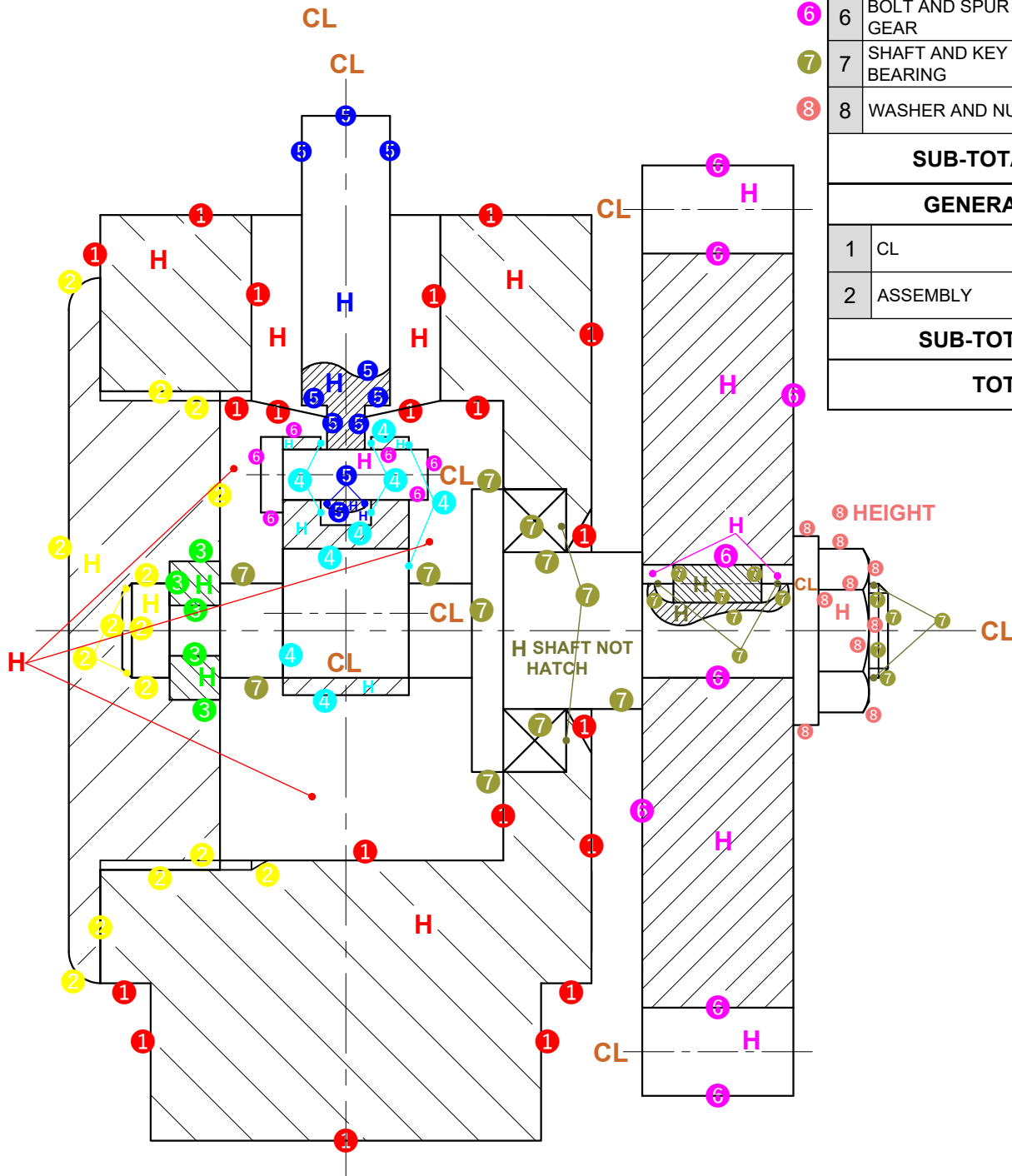
QUESTION 4: MECHANICAL ASSEMBLY

SECTIONAL FRONT VIEW

1	HOUSING	13
2	CAP	$8\frac{1}{2}$
3	SEAL	$3\frac{1}{2}$
4	CAM	6
5	PIN	7
6	BOLT AND SPUR GEAR	$9\frac{1}{2}$
7	SHAFT AND KEY & BEARING	$12\frac{1}{2}$
8	WASHER AND NUT	$5\frac{1}{2}$
SUB-TOTAL		$65\frac{1}{2}$

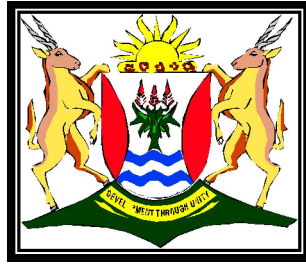
GENERAL

1	CL	2
2	ASSEMBLY	11
SUB-TOTAL		13
TOTAL		$89\frac{1}{2}$



1. CENTER LINES
SANS COMPLIANT
CENTRE LINES
(1 - 7 = 0,5 ; 8 - 12 = 1)
TOTAL

1
 $\frac{1}{2}$
2



**ISEBE LEMFUNDO LEMPUMA KOLONI
EASTERN CAPE EDUCATION DEPARTMENT
OOS-KAAP ONDERWYSDEPARTEMENT**

NASIONALE SENIOR SERTIFIKAAT

GRAAD 12

INGENIEURSGRAFIKA EN -ONTWERP V2

SEPTEMBER 2026

**VOORBEREIDINGSEKSAMEN
NASIENRIGLYN**

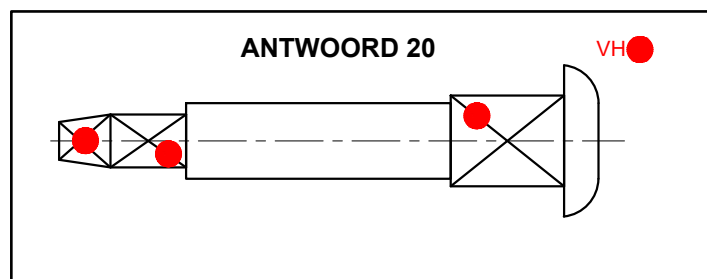
PUNTE: 200

Hierdie nasienriglyn bestaan uit 7 bladsye.

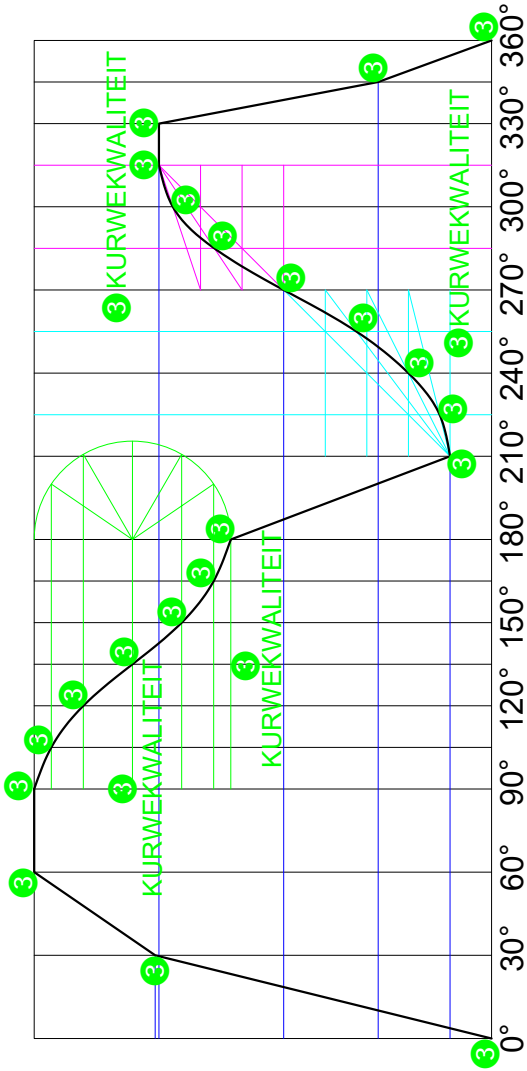
Kopiereg voorbehou

VRAAG 1: ANALITIES (MEGANIES)

ANTWOORDE		
1	2026/02/21	1
2	Vliegtuig laersteunstuk	1
3	CAD / RGO	1
4	30 000	1
5	Verharding	1
6	$\pm 0,25$	1
7	SNYVLAK	1
8	REGTERAANSIG	2
9	TEENAANBORING	1
10	MULTIVLAKSNIT	1
11	AGTEREENVOLGEND	2
12	$B = 60^\circ$, $C = 200 \text{ mm}$, $D = 3 \text{ mm}$, $E = 29 \text{ mm}$	4
13	WEB / RIB	1
14	DIEPTE	1
15	SENTERS	1
16	$8 \times 0,1 = 0,8 \text{ mm}$	1
17	VASMAAKPLEK	2
18	GEEN MASJINEERING	1
19	$48 - 0,15 = 47,85 \text{ mm}$	2
20	SIEN HIERONDER	2
TOTAAL		28



VRAAG 2: LOKUS (NOK)



2. KONSTRUKSIE VAN DIAGRAM

- BASISLENGTE 132 mm 0,5
- 12 VERDELINGS 0,5

EENVORMIGE VERSNELLING + VERTRAGING

- HOOGTE VERDELINGS 0,5
- EERSTE HELFDE KONSTRUKSIE 0,5
- TWEEDE HELFDE KONSTRUKSIE 0,5
- 15° ADDISIONELE VERDELINGS 0,5

EENVOUDIGE HARMONIESE BEWEEGING

- SEMISIRKEL 0,5
- SIRKEL VERDELING 0,5
- 15° ADDISIONELE VERDELINGS 0,5
- PROJEKSIE 0,5

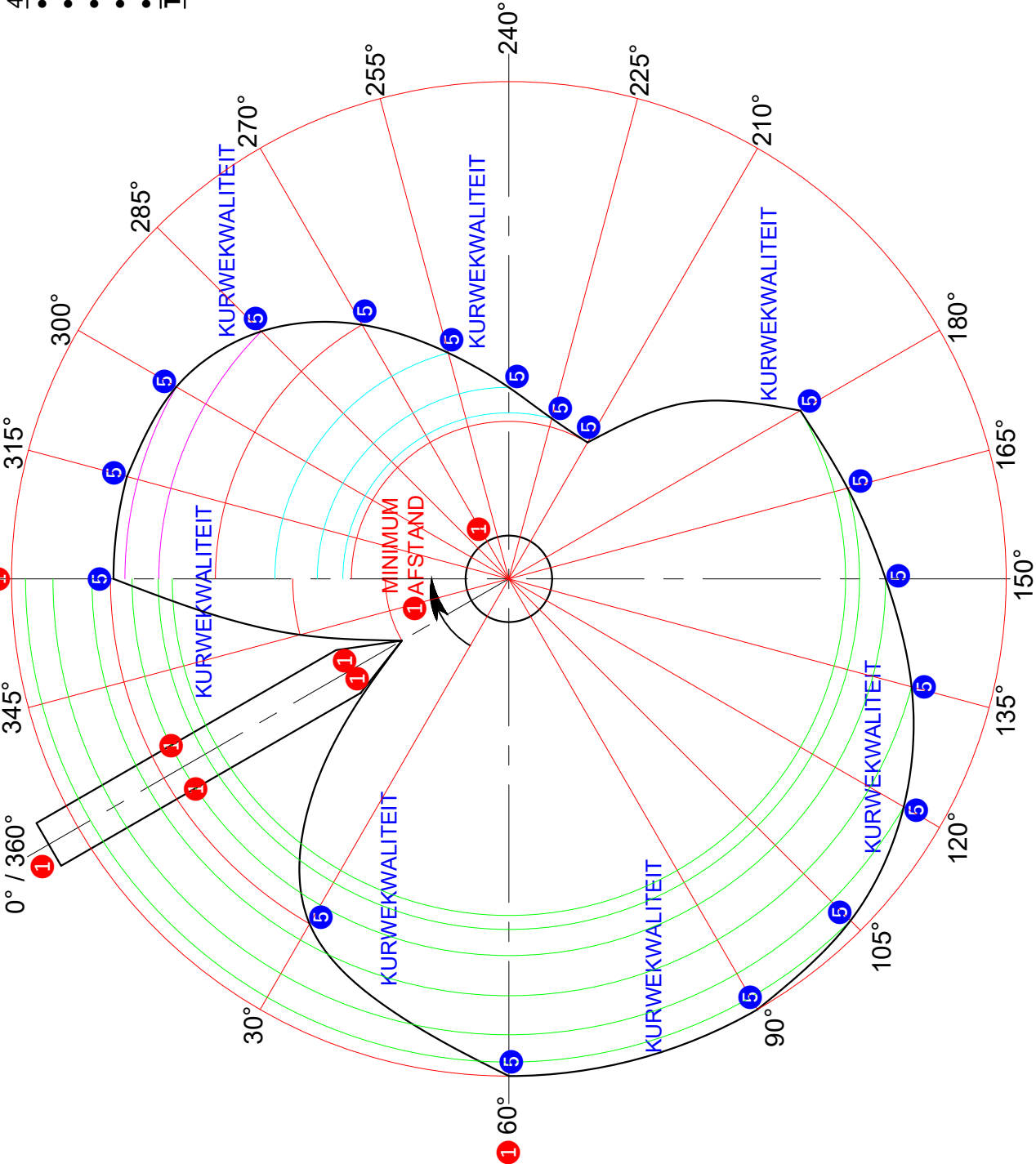
TOTAAL 5

ASSESSERINGSKRITERIA		
1	GEGEE + MINIMUM AFSTAND + SL	4½
2	GRAFIEKKONSTRUKSIE	5
3	VERPLASINGSGRAFIK	13
4	KONSTRUKSIE VAN NOK	4
5	NOK PROFIEL + KURWEKWALITEIT	12
TOTAAL		38½

3

VRAAG 2: LOKUS (NOK)

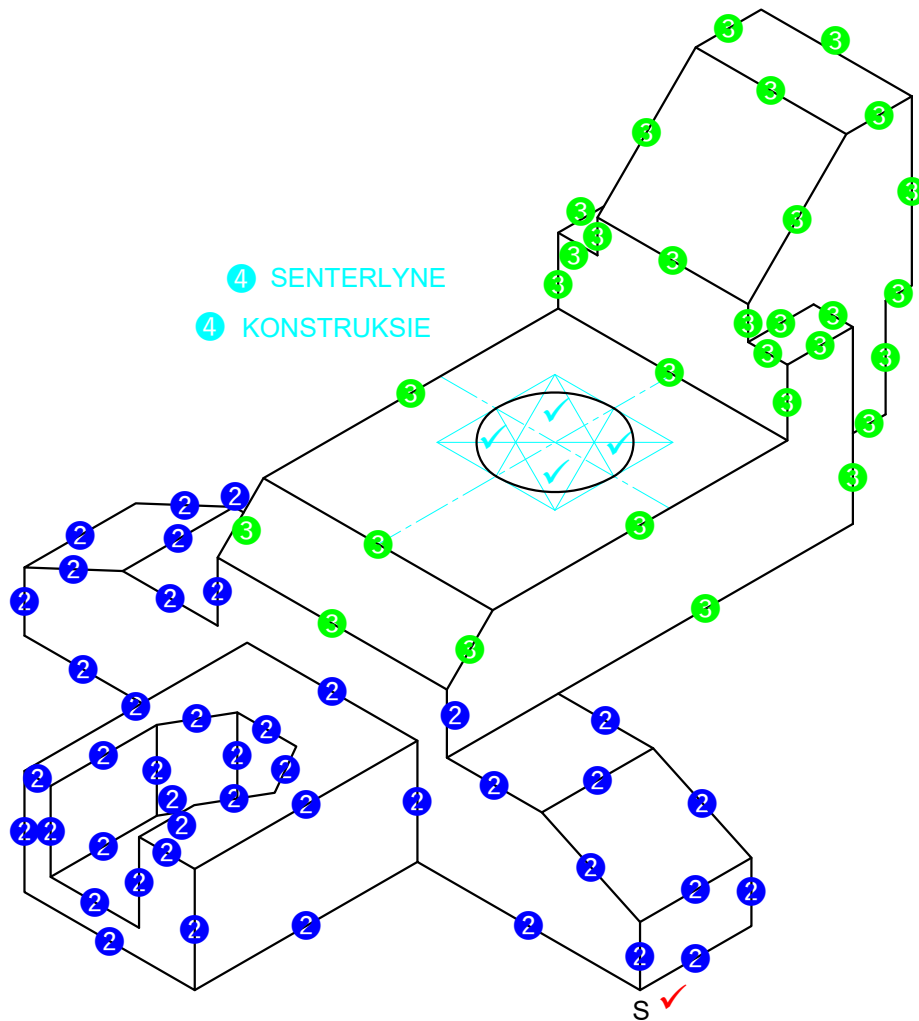
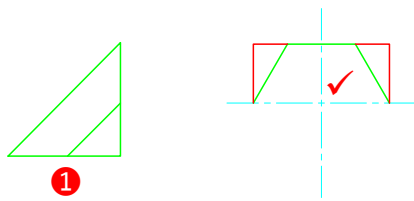
4. NOKKONSTUKSIE
- GEGEDE POSISIE GELYK AAN 0° 0,5
 - UITSTRIP RIGTING KLOKGEWYS 1
 - DUI AAN RIGTING MET PYL 0,5
 - PROJEKSIE VANAF GRAFIEK 1
 - SIRKEL VERDELING 1
- TOTAAL 4**



ASSESSERINGSKRITERIA		
1	GEGEE + MINIMUM AFSTAND + SL	4½
2	KONSTRUKSIE VAN GRAFIEK	5
3	VERPLASINGS VAN GRAFIEK	13
4	KONSTRUKSIE VAN NOK	4
5	NOKPROFIEL + KURWEKWALITEIT	12
TOTAAL		38½

4

VRAAG 3: ISOMETRIES



ASSESSERINGSKRITERIA		
1	HULPAANSIG + PLASING	2 $\frac{1}{2}$
2	ONDER HELFTE	21 $\frac{1}{2}$
3	BOONSTE HELFTE	15
4	SIRKEL + SL'E	5
TOTAAL		44

1 ✓

2

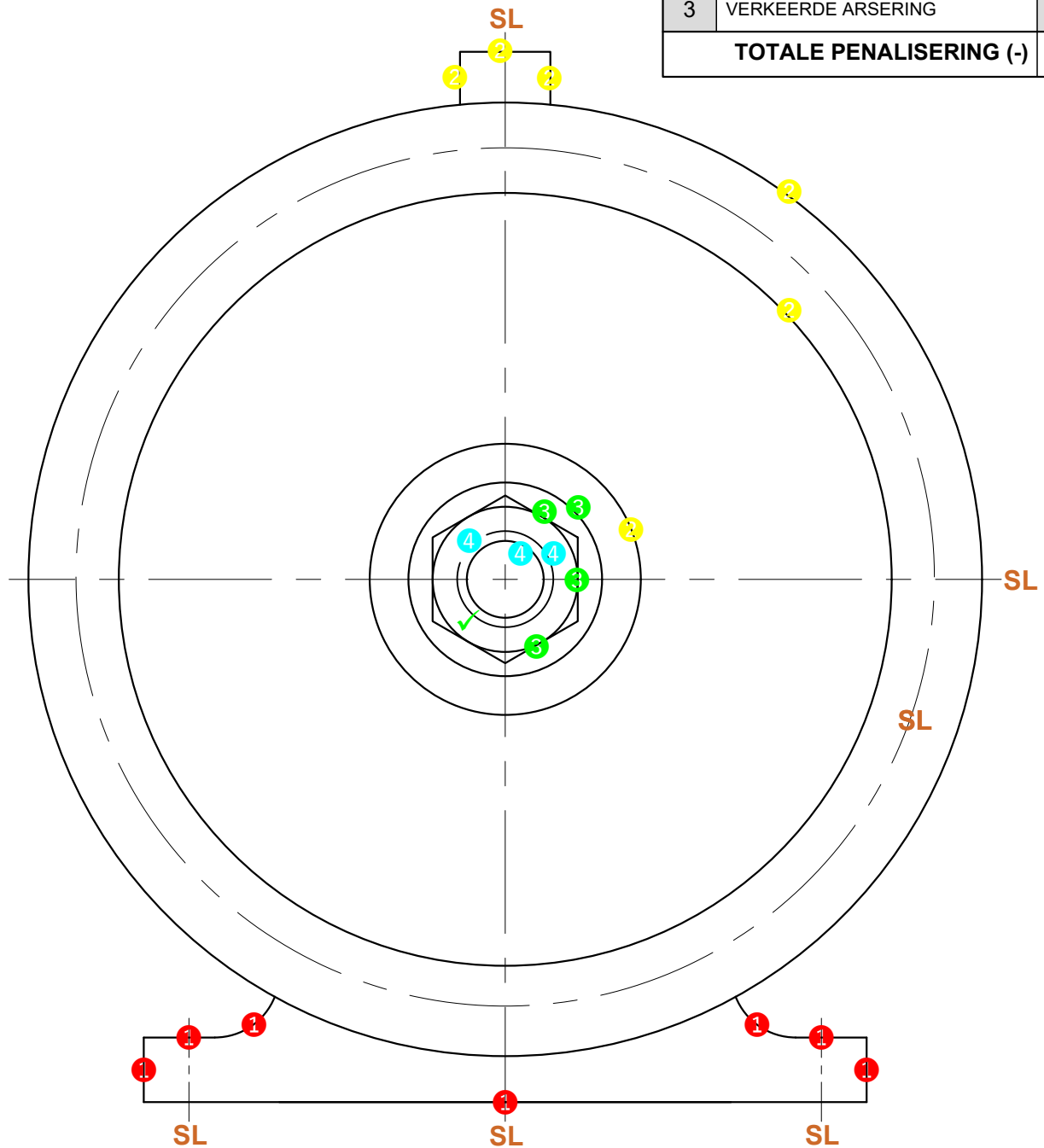
3

4 ✓

5

VRAAG 4: MEGANIESE SAMESTELLING

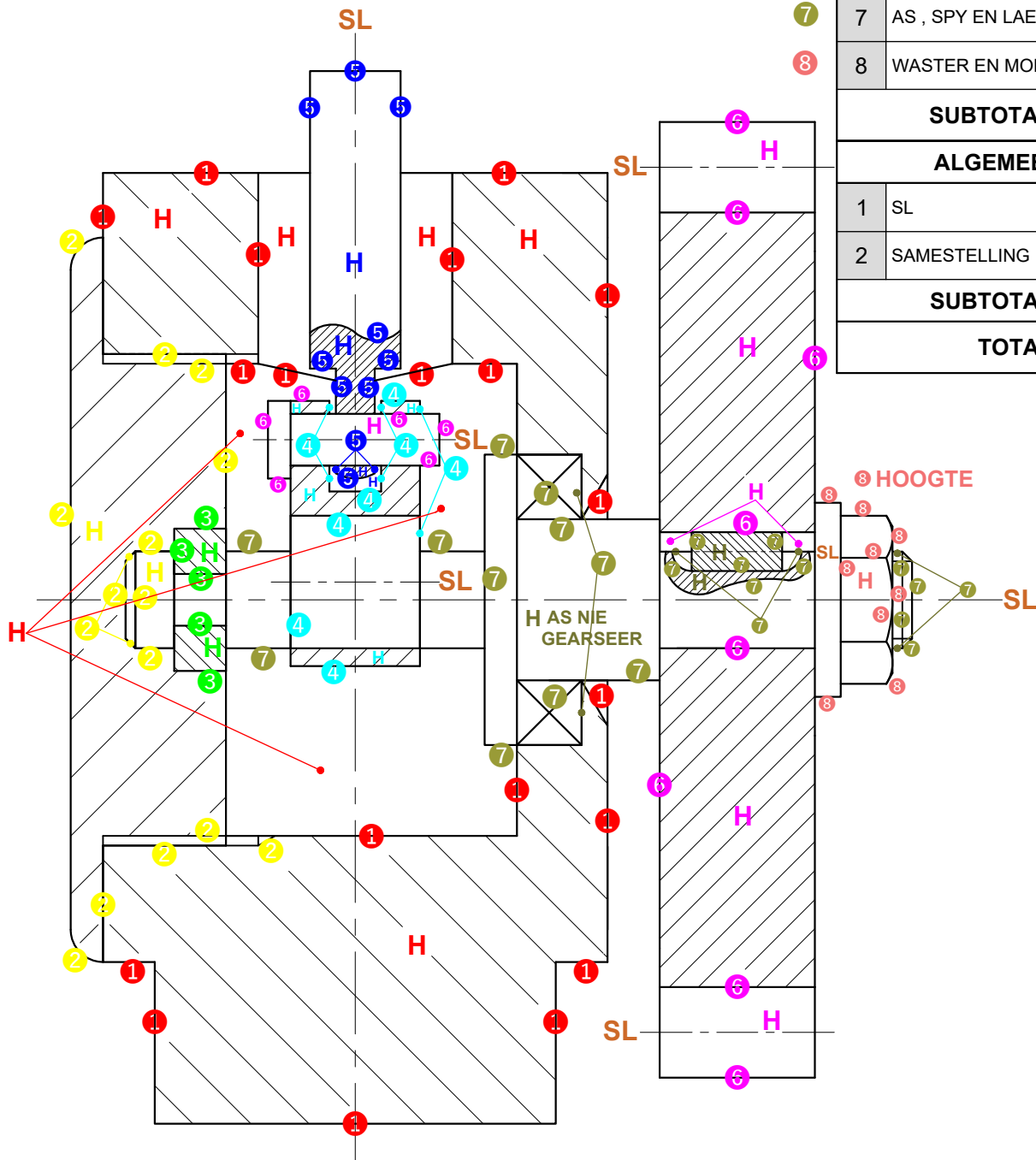
PENALISERING		
1	VERKEERDE SKAAL	-2
2	ONDERDELE NIE SAAMGESTEL NIE -1 PER ONDERDEEL MAKS	-10
3	VERKEERDE ARSERING	-2
TOTALE PENALISERING (-)		



REGTERAANSIG		
1	HULSEL	3½
2	PEN EN REGUITTANDRAT	3
3	WASTER EN MOER	3
4	AS	1½
SUBTOTAAL		11

6

VRAAG 4: MEGANIESE SAMESTELLING



DEURSNEE VOORAANSIG

1	HULSEL	13
2	DOP	8 $\frac{1}{2}$
3	SEËL	3 $\frac{1}{2}$
4	NOK	6
5	PEN	7
6	BOUT EN REGUITTANDRAT	9 $\frac{1}{2}$
7	AS, SPY EN LAER	12 $\frac{1}{2}$
8	WASTER EN MOER	5 $\frac{1}{2}$
SUBTOTAAL		65$\frac{1}{2}$

ALGEMEEN

1	SL	2
2	SAMESTELLING	11
SUBTOTAAL		13
TOTAAL		89$\frac{1}{2}$

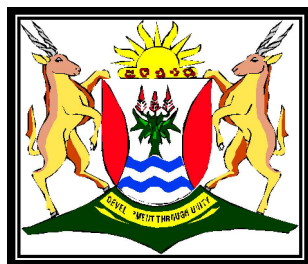
1. SENTERLYNE
VOLDOEN AAN SANS
SENTERLYNE
(1 - 7 = 0,5 ; 8 - 12 = 1)
TOTAAL

1

 $\frac{1}{2}$

2

7



**ISEBE LEMFUNDO LEMPUMA KOLONI
EASTERN CAPE EDUCATION DEPARTMENT
OOS-KAAP ONDERWYSDEPARTEMENT**

GRADE 12

**ENGINEERING GRAPHICS AND DESIGN
PAPER 2
SEPTEMBER 2026
PREPATORY EXAMINATION
MARKING GUIDELINES**

WEIGHTING OF QUESTIONS					
QUESTION	LOW	MIDDLE	HIGH	TOTAL	% OF PAPER
1	11.0	9.0	8.0	28.0	14.0
	39.3	32.1	28.6		
2	11.5	16.0	11.0	38.5	19.3
	29.9	41.6	28.6		
3	15.0	16.0	13.0	44.0	22.0
	34.1	36.4	29.5		
4	25.5	35.0	29.0	89.5	44.8
	28.5	39.1	32.4		
TOTAL	63.0	76.0	61.0	200.0	
	32.9	37.3	29.8		