

STAPLE

MARKING GUIDELINES

EXAMINATION	NATIONAL SENIOR CERTIFICATE
DATE	NOVEMBER 2025
SUBJECT	ENGINEERING GRAPHICS AND DESIGN
PAPER	2
TOTAL MARKS	100
DURATION (HOURS)	3
NUMBER OF PAGES	5



SOUTH AFRICAN COMPREHENSIVE ASSESSMENT INSTITUTE
SUID-AFRIKAANSE KOMPREENSIEWE ASSESSERINGSINSTITUUT

FINAL APPROVED MARKING GUIDELINES

DATE OF MEETING	
UMALUSI MODERATOR	
CHIEF MARKER	
INTERNAL MODERATOR	

INSTRUCTIONS AND INFORMATION

1. This 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 questions must be answered on the question paper, as instructed.
7. ALL pages must be placed in numerical order and stapled in ONLY the TOP LEFT CORNER once completed, regardless whether the question was answered or not.
8. Time management is essential in order to complete all the questions.
9. Print your examination number in the block provided on each page.
10. Any detail or dimensions not given must be assumed in good proportion.

FOR OFFICIAL USE ONLY															
QUESTION	MARK OBTAINED			½	SIGN	MODERATED			½	SIGN	RE-MARKING			½	SIGN
1															
2															
3															
4															
TOTAL:	2	0	0			2	0	0			2	0	0		

FINAL CALCULATED MARK

CHECKED

100

CENTRE NUMBER

CENTRE NUMBER

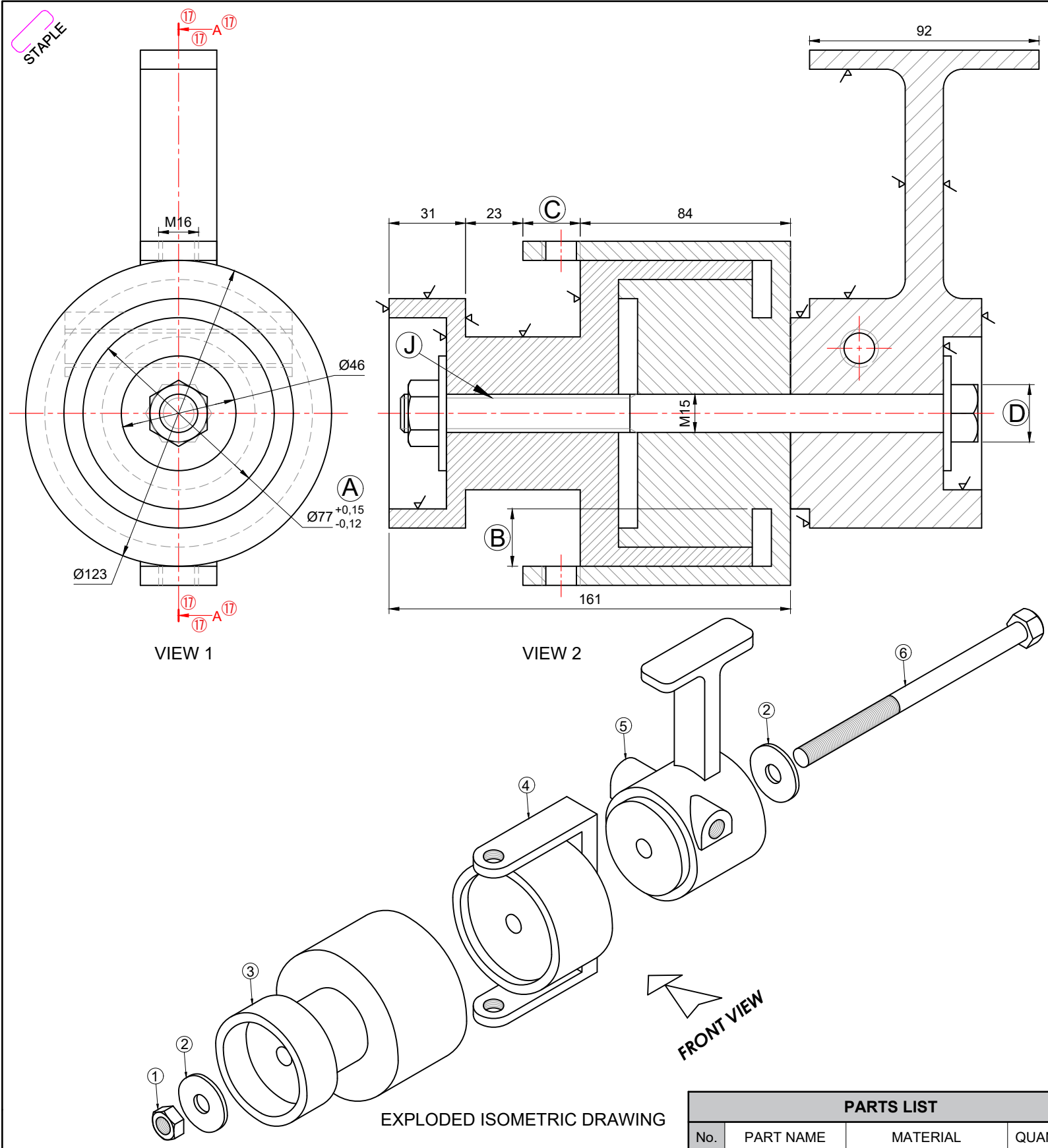
IDENTIFICATION NUMBER

IDENTIFICATION NUMBER

EXAMINATION NUMBER

EXAMINATION NUMBER

1



QUESTION 1: MECHANICAL ANALYTICAL

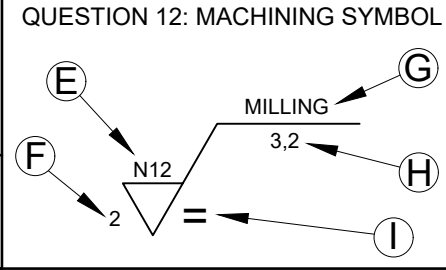
Given:
Two views and an exploded isometric drawing of an FISHING REEL ASSEMBLY, a parts list, a title block and a table of questions.

Instructions:
Complete the table below by neatly answering the questions, which refer to the accompanying drawing, title block, parts list and mechanical content. [25]

QUESTIONS		ANSWERS		
1	What is the title of the drawing?	FISHING REEL ASSEMBLY	1	
2	Who approved the drawing?	CALEB	1	
3	On what date was the drawing checked?	15/05/2025	1	
4	What does the abbreviation NTS stand for?	NOT TO SCALE	1	
5	From what material is part 3 made of?	GRAPHITE	1	
6	How many parts makes up the fishing reel assembly?	7	1	
7	With reference to the tolerance at A, determine the minimum dimension.	76,88	1	
8	What is the thickness of the NUT?	12	1	
9	How many surfaces of part 5 must be machined?	9	1	
10	What would VIEW 1 be called?	LEFT VIEW	1	
11	Determine the complete dimensions at:	B: 23	1	
		C: 23	1	
		D: 22,5	1	
12	With reference to the machining symbol below (QUESTION 12), match the letter on the symbol with the correct label in the column to the right of this question.	PRODUCTION METHOD	G	1
		ROUGHNESS VALUE	E	1
		DIRECTION OF LAY	I	1
		MACHINING ALLOWANCE	F	1
13	Name the feature at J.	SCREW THREAD	1	
14	In the space below (ANSWER 14), draw in neat freehand , the symbol for the projection system used.		4	
15	Insert the cutting plane for VIEW 2 on VIEW 1 and label the cutting plane A-A.		3	
		25		

FISH ENGINEERING
15 BELLA STREET,
JOHANNESBURG, 5680
071 582 5490
www.fishengineering.co.za

TITLE:
FISHING REEL ASSEMBLY



PARTS LIST			
No.	PART NAME	MATERIAL	QUANTITY
1	NUT	STAINLESS STEEL	1
2	WASHER	STAINLESS STEEL	2
3	SPOOL	GRAPHITE	1
4	LINE ROLLER	ALUMINIUM	1
5	REEL FOOT	GRAPHITE	1
6	BOLT	STAINLESS STEEL	1

DRAWN:	AMIRAH	DATE:	07/02/2025
CHECKED:	JAN	DATE:	15/05/2025
APPROVED:	CALEB	DATE:	06/07/2025
UNLESS OTHERWISE SPECIFIED, ALL TOLERANCES ARE ±0,2	ALL DIMENSIONS ARE IN MILLIMETRES		
DRAWING PROGRAM: AUTOCAD 2025	QUANTITY: 500 FISHING REELS		
DRAWING NUMBER: EGD-P2	SCALE: NTS		

ANSWER 14: PROJECTION SYMBOL

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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, sliding rod BF, connecting rods CDE and curve rod PQ.
- The position of centre point A on the answer sheet.

Specifications:

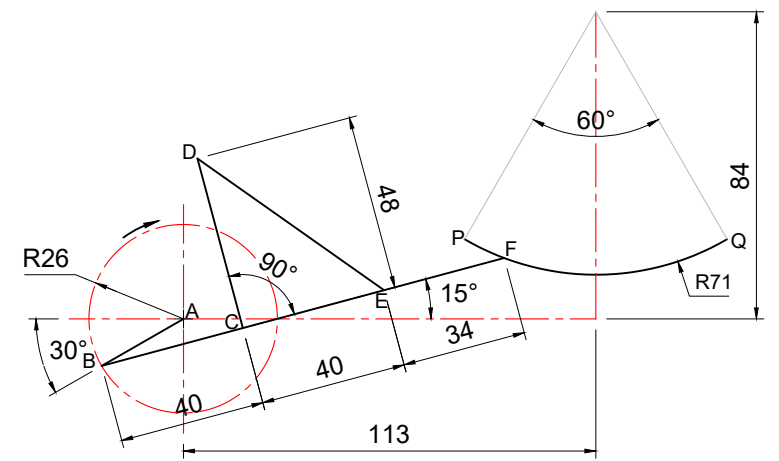
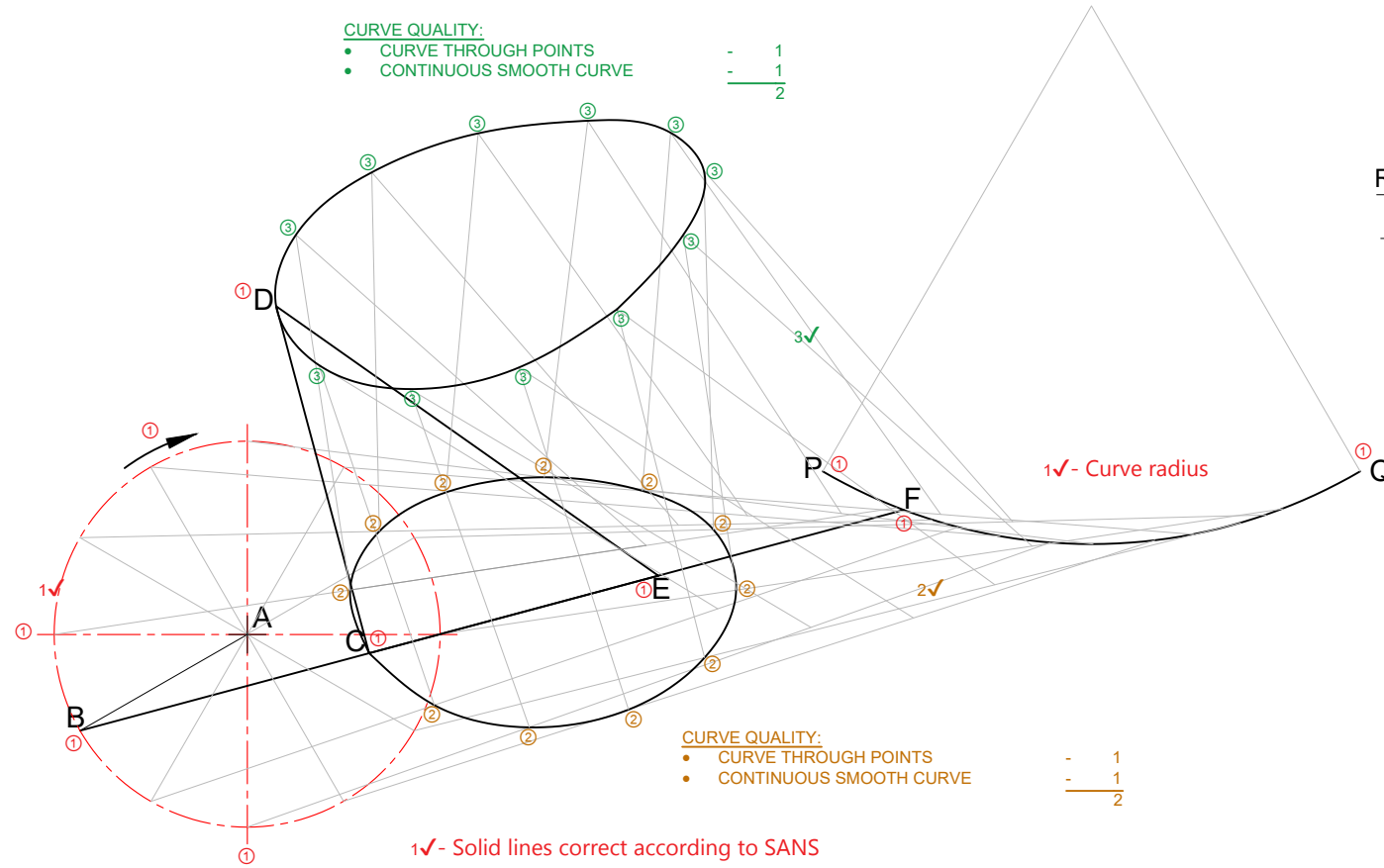
- The positions of centre point A and curve rod PQ are fixed.
- Rod BF is 114mm.
- The radius of the curve rod PQ is 71mm.
- C and E are pin-jointed to sliding rod BF.

Motion:

As crank AB rotates clockwise, point F reciprocates along the curve PQ.

Instructions:

- Using centre point A on the drawing sheet, draw, to a scale of 1 : 1, the schematic drawing of the mechanism.
- Trace the loci generated by point C and D for ONE complete clockwise rotation of crank AB.
- Show ALL necessary construction. **[25]**



ASSESSMENT CRITERIA			
1	GIVEN	8	
2	LOCI OF C + CONSTRUCTION	8½	
3	LOCI OF E + CONSTRUCTION	8½	
		PENALTIES(-):	
		SUBTOTAL:	25

2.2 CAM

Given:

The top left-hand corner of the displacement graph, marked 0°, on the drawing sheet.

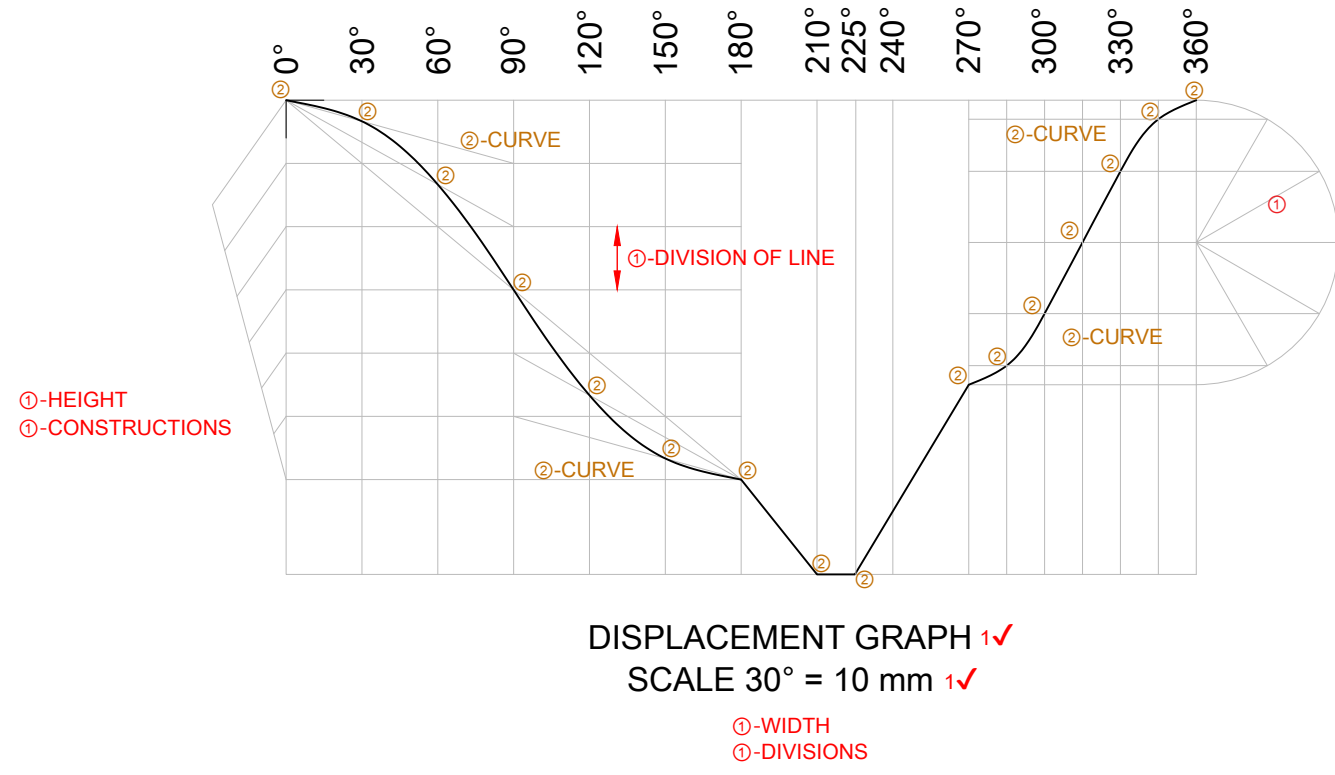
Motion:

A cam rotates at constant velocity imparting the following motion to a follower:

- The follower falls 50mm with uniform acceleration and retardation over the first 180°.
- The follower falls another 13mm over the next 30° with uniform motion.
- There is a dwell period for the next 15°.
- It rises 25mm with uniform motion for the next 45°.
- The follower returns to its original starting position with simple harmonic motion.

Instructions:

- Draw to a rotational scale of 30°=10mm and a displacement scale of 1:1, the complete displacement graph for the required motion.
- Label the displacement graph.
- Show ALL necessary construction. **[15]**

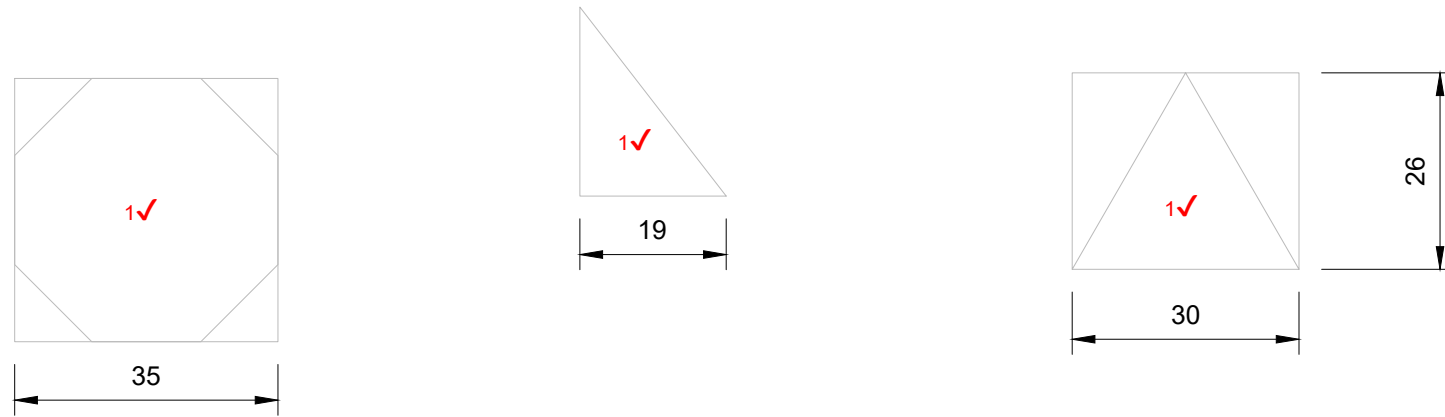


DISPLACEMENT GRAPH 1✓
SCALE 30° = 10 mm 1✓

ASSESSMENT CRITERIA			
1	LABELS + CONSTRUCTION	5	
2	DISPLACEMENT GRAPH	10	
		PENALTIES(-):	
		2.2 SUBTOTAL:	15
		2.1 SUBTOTAL:	25
		TOTAL:	40

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QUESTION 3: ISOMETRIC DRAWING

Given:

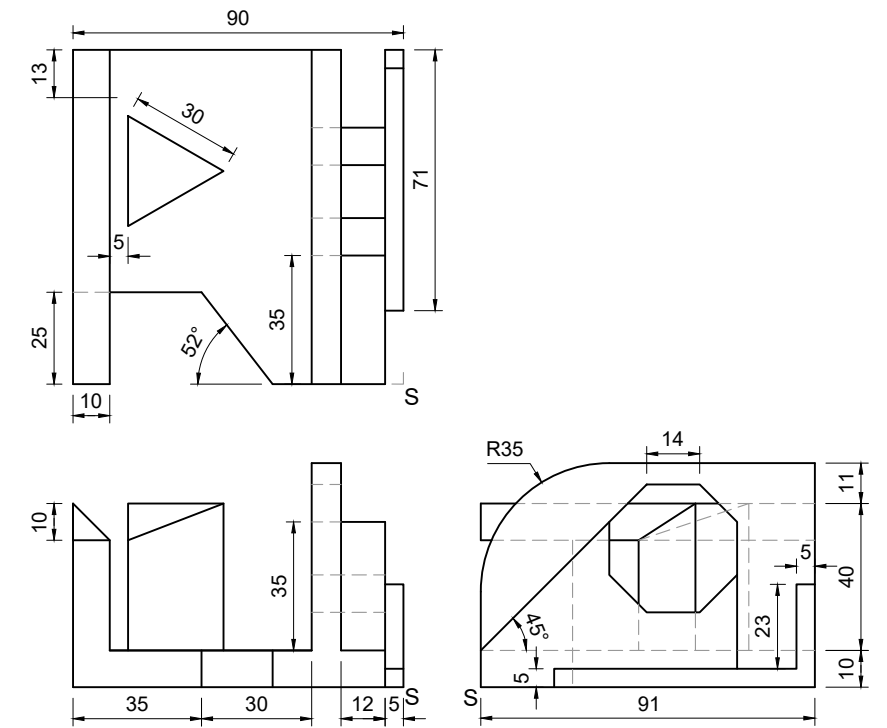
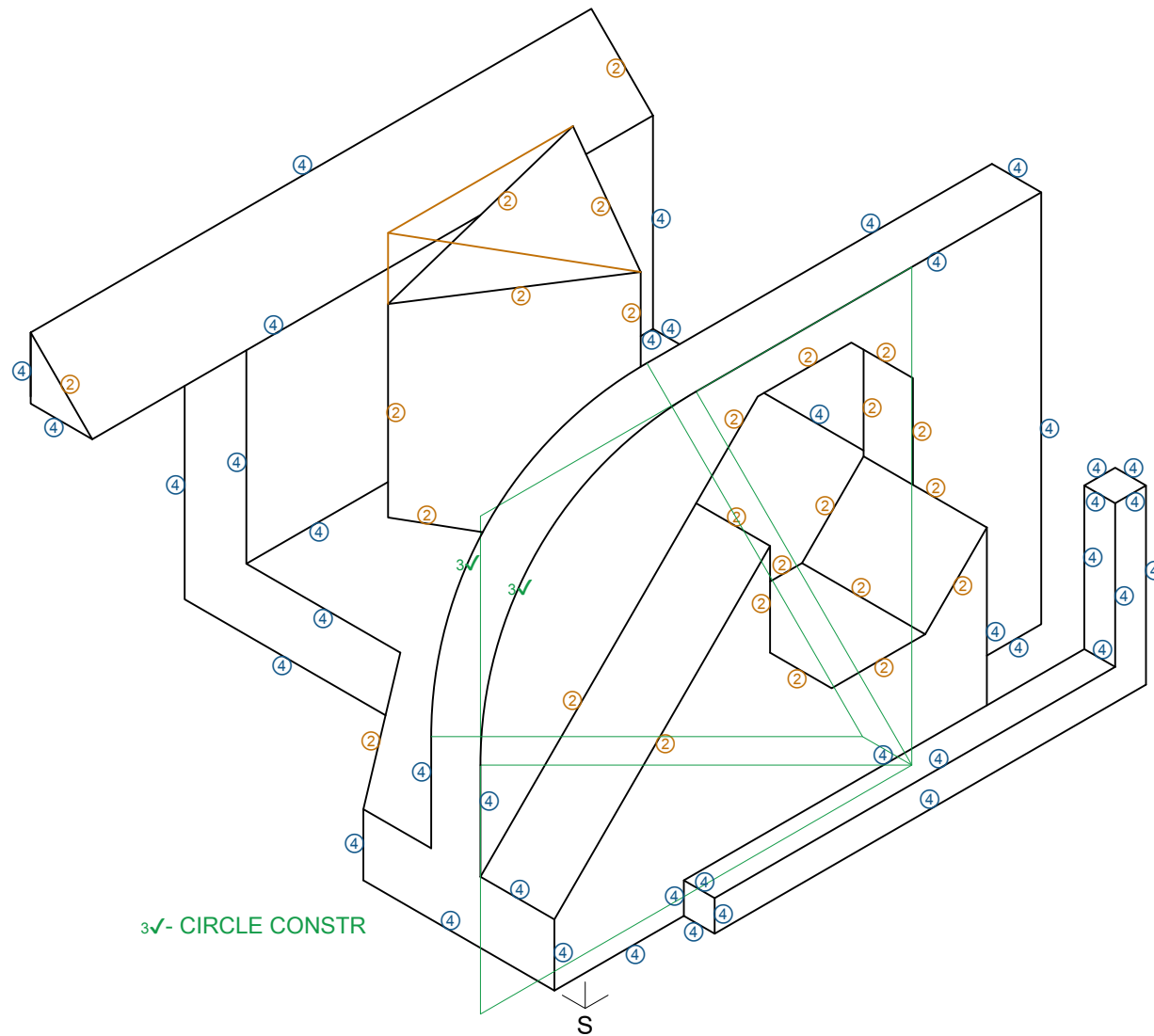
- The front view, top view and right view of a casting.
- The position of point S on the drawing sheet.

Instructions:

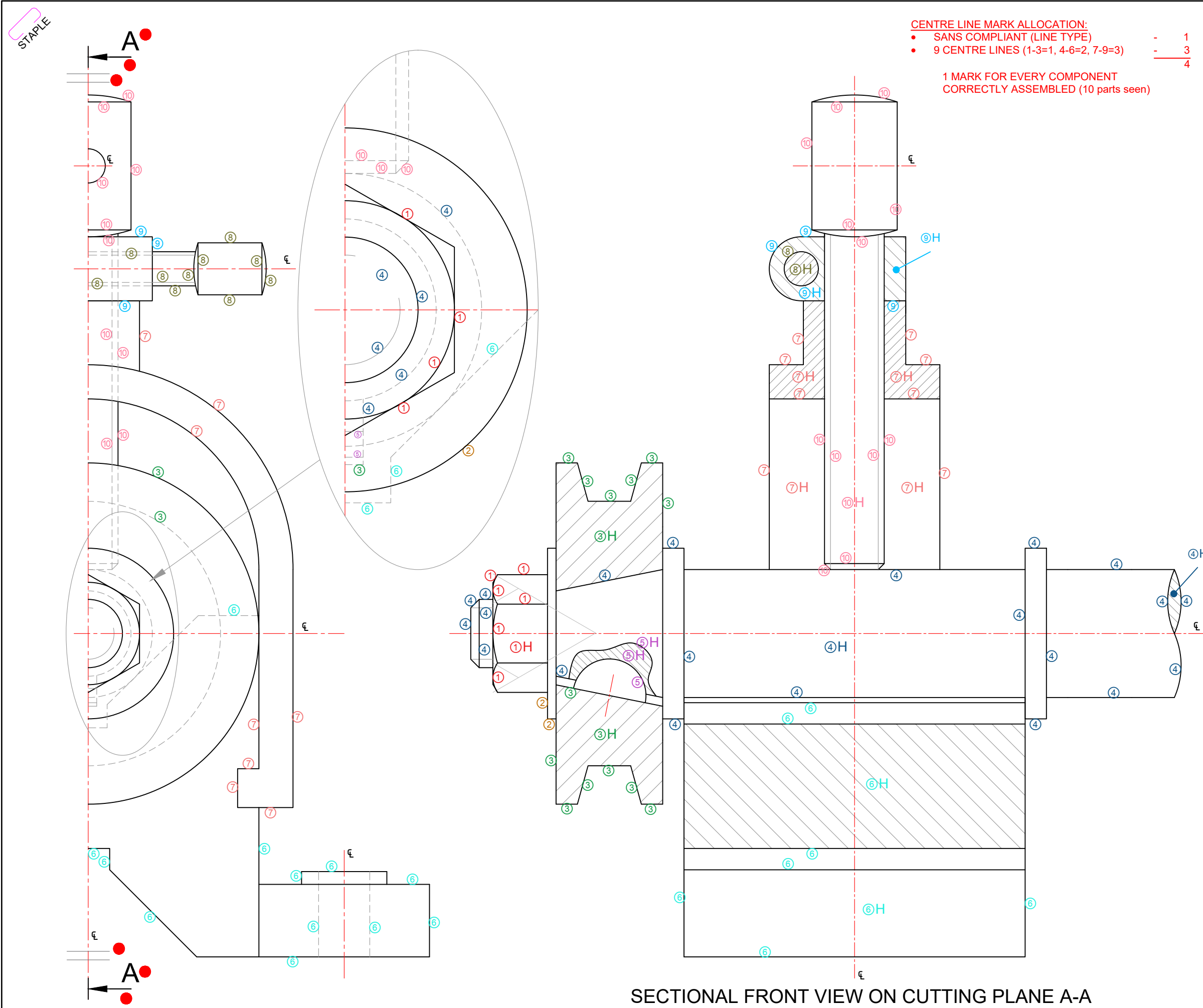
Using scale 1 : 1, convert the orthographic views of the casting into an isometric drawing.

- Use point S as the starting point and lowest point of the drawing.
- Show ALL necessary construction.
- NO hidden detail is required.

[40]



ASSESSMENT CRITERIA			
1	AUXILIARY VIEWS + PLACEMENT + ORIENTATION	4	
2	OCTAGON + NON ISOMETRIC LINES	12½	
3	CIRCLE + CIRCLE CONSTRUCTIONS + CENTRE LINES	3	
4	ISOMETRIC LINES	20½	
PENALTIES(-):			
TOTAL:		40	
EXAMINATION NUMBER			
EXAMINATION NUMBER			4



CENTRE LINE MARK ALLOCATION:

- SANS COMPLIANT (LINE TYPE) - 1
- 9 CENTRE LINES (1-3=1, 4-6=2, 7-9=3) - 3

1 MARK FOR EVERY COMPONENT CORRECTLY ASSEMBLED (10 parts seen)

FOR OFFICIAL USE ONLY	
INCORRECT ORTHOGRAPHIC PROJECTION	
INCORRECT OVERALL SCALE	
INCORRECT HATCHING	
PARTS NOT ASSEMBLED	
TOTAL:	

ASSESSMENT CRITERIA

LEFT VIEW			
1	NUT	2	
2	WASHER	1/2	
3	PULLEY	1 1/2	
4	SHAFT	3	
5	KEY	1	
6	V - BLOCK	7 1/2	
7	CLAMP	4	
8	HANDLE SHAFT	5	
9	HANDLE BASE	1 1/2	
10	SCREW	7 1/2	
SUBTOTAL:		33 1/2	

FULL SECTIONAL FRONT VIEW			
1	NUT	3 1/2	
2	WASHER	1	
3	PULLEY	7 1/2	
4	SHAFT	11 1/2	
5	KEY	1 1/2	
6	V - BLOCK	4 1/2	
7	CLAMP	6	
8	HANDLE SHAFT	1	
9	HANDLE BASE	2 1/2	
10	SCREW	5 1/2	
SUBTOTAL:		44 1/2	

GENERAL			
1	CENTRE LINES - ε	4	
2	ASSEMBLY	10	
3	CUTTING PLANE AND SYMMETRY	3	
SUBTOTAL:		17	
TOTAL:		95	
PENALTIES(-):			
GRAND TOTAL:			

EXAMINATION NUMBER	
EXAMINATION NUMBER	

SECTIONAL FRONT VIEW ON CUTTING PLANE A-A