



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

ENGINEERING GRAPHICS AND DESIGN P2
MAY/JUNE 2026

MARKS: 100
TIME: 3 hours

This question paper consists of 6 pages.

Barcode label

DO NOT FOLD THE QUESTION PAPER IN HALF.

Confidential

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 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 examination number in the 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			$\frac{1}{2}$	SIGN	MODERATED			$\frac{1}{2}$	SIGN	RE-MARKING
1											
2											
3											
4											
TOTAL											
	2	0	0			2	0	0			2 0 0

FINAL CONVERTED MARK	CHECKED BY
100	

COMPLETE THE FOLLOWING: .
CENTRE NUMBER
CENTRE NUMBER
EXAMINATION NUMBER
EXAMINATION NUMBER





S
0°

QUESTION 2: LOCI

NOTE: Answer QUESTIONS 2.1 and 2.2.

2.1: CAM

Given:
The bottom left-hand corner of the displacement graph, marked S, on the drawing sheet

Motion:
A cam starts at the **minimum** displacement and imparts the following motion:

- There is a dwell period for the first 45°.
- It rises 18 mm over the next 15° with uniform motion.
- It rises a further 64 mm over the next 90° with simple harmonic motion.
- It descends 48 mm over the next 120° with uniform acceleration and retardation.
- Over the next 75° it descends to the minimum displacement with uniform motion.
- It returns to its original position over the last 15°.

- Instructions:**
- Start at corner S and draw, to a rotational scale of 156 mm = 360° and a displacement scale of 1 : 1, the displacement graph for the given motion.
 - Label the displacement graph and include the rotational scale.
 - Show ALL construction. [17½]

ASSESSMENT CRITERIA 2.1				
1	GRAPH CONSTRUCTION	6		
2	POINTS + CURVES	10½		
3	LABELS	1		
PENALTIES (-)				
SUBTOTAL		17½		

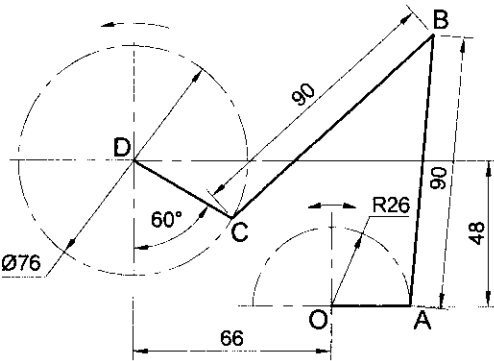
2.2: MECHANISM

- Given:**
- A schematic diagram of a mechanism consisting of crank OA, connecting rod AB, connecting rod BC and crank DC
 - The position of centre point O on the drawing sheet

- Specifications:**
- The positions of centre point O and centre point D are fixed.
 - Connecting rod AB is pin-jointed to crank OA at A.
 - Connecting rod BC is pin-jointed to connecting rod AB at B.
 - Connecting rod BC is pin-jointed to crank DC at C.

Motion:
As crank OA oscillates through 180° on centre point O, crank DC rotates in an anti-clockwise direction at the same speed.

- Instructions:**
- Using centre point O, draw, to scale 1 : 1, the given schematic diagram of the mechanism and label ALL the given points.
 - Trace the locus generated by point B for ONE complete motion of crank OA and crank DC.
 - Show ALL construction. [21½]

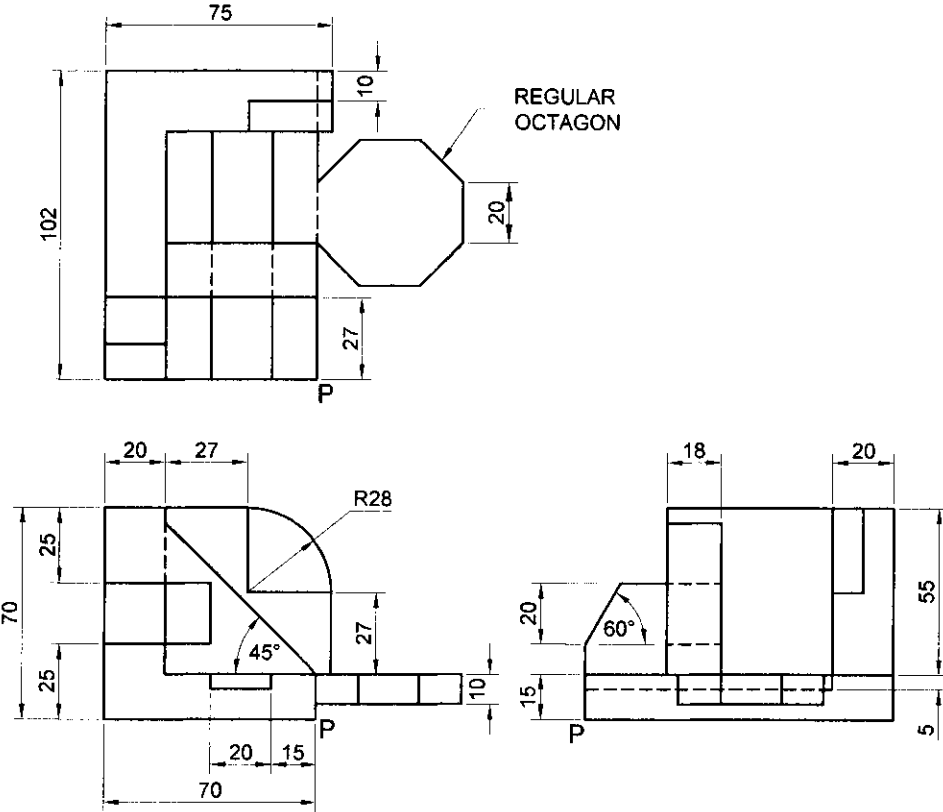


ASSESSMENT CRITERIA 2.2				
1	GIVEN	7½		
2	CONSTRUCTION	5		
3	POINTS + CURVE	9		
PENALTIES (-)				
SUBTOTAL 2.2		21½		
SUBTOTAL 2.1		17½		
TOTAL		39		
EXAMINATION NUMBER				
EXAMINATION NUMBER				

STAPLE

QUESTION 3: ISOMETRIC DRAWING

- Given:**
- The front view, top view and right view of a casting
 - The position of point P on the drawing sheet
- Instructions:**
- Using scale 1 : 1, convert the orthographic views of the casting into an isometric drawing.
- Use P as the starting point and lowest point of the drawing.
 - Show ALL construction.
 - NO hidden detail is required.
- [41]



P

ASSESSMENT CRITERIA				
1	PLACING + AUX. VIEW	2 ½		
2	BASE	12 ½		
3	UPPER PORTION	17 ½		
4	ARCS + CONSTRUCTION	2 ½		
5	OCTAGON	6		
PENALTIES (-)				
TOTAL		41		
EXAMINATION NUMBER				
EXAMINATION NUMBER				4

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INCORRECT ORTHOGRAPHIC PROJECTION	
INCORRECT OVERALL SCALE	
INCORRECT HATCHING	
PARTS NOT ASSEMBLED	
TOTAL PENALTIES (-)	

ASSESSMENT CRITERIA					
TOP VIEW					
		POSSIBLE	OBTAINED	SIGN	MODERATED
1	PUMP HOUSING	8½			
2	PLUNGER	2½			
3	LEVER	1½			
4	CAP SCREW	2½			
5	GUIDE + KNURLING	5			
SUBTOTAL		20			
SECTIONAL FRONT VIEW					
1	PUMP HOUSING	26			
2	PLUNGER	6			
3	LEVER + ANGLE	5			
4	CAP SCREW	6½			
5	GUIDE	7			
6	O-RING	2½			
7	PINS	2			
8	BALL VALVE	1			
SUBTOTAL		56			
GENERAL					
1	CENTRE LINES	3			
2	CUTTING PLANE	3			
3	ASSEMBLY	8			
SUBTOTAL		14			
TOTAL		90			
PENALTIES (-)					
GRAND TOTAL					
EXAMINATION NUMBER					
EXAMINATION NUMBER					6