GAUTENG DEPARTMENT OF EDUCATION
GAUTENGSE DEPARTEMENT VAN ONDERWYS

SENIOR CERTIFICATE EXAMINATION
SENIORSERTIFIKAAT-EKSAMEN

OCTOBER / NOVEMBER
OKTOBER / NOVEMBER

2006

TECHNICAL DRAWING
TEGNIESE TEKENE

(First Paper : Descriptive Geometry and Locus)
(Eerste Vraestel : Beskrywende Meetkunde en Lokus)

HG

711-1/1

Cover + 8 pages
Voorblad + 8 bladsye

GAUTENG
DEPARTMENT OF EDUCATION

SENIOR CERTIFICATE EXAMINATION

TECHNICAL DRAWING HG 711-1/1 U

(First Paper : Descriptive Geometry and Locus)

TIME : 3 hours

MARKS : 200

INSTRUCTIONS:

1. **All** questions are compulsory.
2. Answer all questions on the answer sheets provided.
3. Any dimensions or details not given may be assumed.
4. Hand in all your answer sheets (whether the question has been attempted or not) in correct **numerical** sequence, **stapled** in the top left-hand corner.
5. Write your examination number on all answer sheets.
6. If not otherwise stated, use a scale of 1:1 for all answers.
7. NOTE : HP = Horizontal Plane VP = Vertical Plane
   HT = Horizontal Trace VT = Vertical Trace
8. Align the answer sheets on centre lines/ground lines and not the frame.
9. The use of coloured lead will be penalised.

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TEGNIESE TEKENE HG 711-1/1 U

(Eerste Vraestel : Beskrywende Meetkunde en Lokus)

TYD : 3 uur

PUNTE : 200

INSTRUKSIES:

1. **Alle** vrae is verpligtend.
2. Beantwoord al die vrae op die gegewe antwoordblaaie.
3. Enige afmetings of besonderhede wat ontbreek, kan afgelei word.
4. Handig al jou antwoordblaaie (ongeag of die vraag beantwoord is of nie) in korrekte **numeriese** volgorde in, **vasgekram** in die boonste linkerkantse hoek.
5. Skryf jou eksamennommer op alle antwoordblaaie.
6. Tensy anders vermeld, gebruik 'n skaal van 1:1 vir alle antwoorde.
7. LET WEL : HV = Horisontale Vlak VV = Vertikale Vlak
   HS = Horisontale Snyspoor VS = Vertikale Snyspoor
8. Rig die antwoordblaaie op hartlyne/grondlyne en nie die raam nie.
9. Die gebruik van gekleurde lood sal gepenaliseer word.

GAUTENG PROVINCIAL GOVERNMENT

FOR OFFICIAL USE ONLY
SLEGS VIR AMPTELIKE GEBRUIK

QUESTION VRAAG	MARKS PUNTE	MODERATED MODERATOR	MAXIMUM MAKSIMUM
1			**30**
2			**25**
3			**20**
4			**30**
5			**30**
6			**30**
7			**25**
PRESEN-TATION / AANBIEDING			**10**
TOTAL TOTAAL			**200**
CHECKED BY / GEKONTRO-LEER DEUR			%

EXAMINATION NUMBER / EKSAMENNOMMER 8 0 6

FIG. 1.1

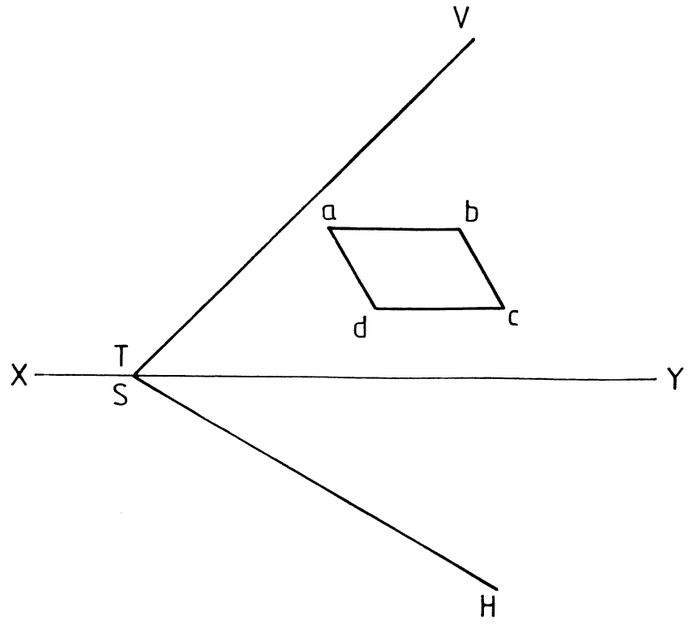


FIG. 1.2

QUESTION 1	MARKS	
1.1 Make use of the following information in **FIG. 1.1** and complete the front view and top view of line segment **AB.** 1.1.1 Geographical bearing = S80°E, true length = 40 mm and true angle to the **HP** = 20° upwards.	10	
1.2 Determine the top view of plane figure **ABCD** lying in the oblique plane in **FIG.1.2**.	4	
1.3 Determine the **VT** and the front view of line segment **AB** lying in the oblique plane in **FIG.1.3** if the true angle between the oblique plane and the **HP** = 40°.	9	
1.4 Determine the trace (line of penetration) and hidden detail between the two plane figures shown in **FIG. 1.4**.	7	
	30	

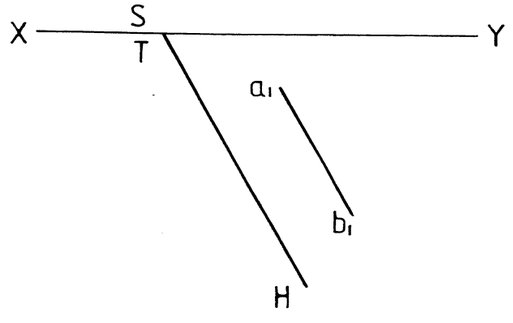


FIG. 1.3

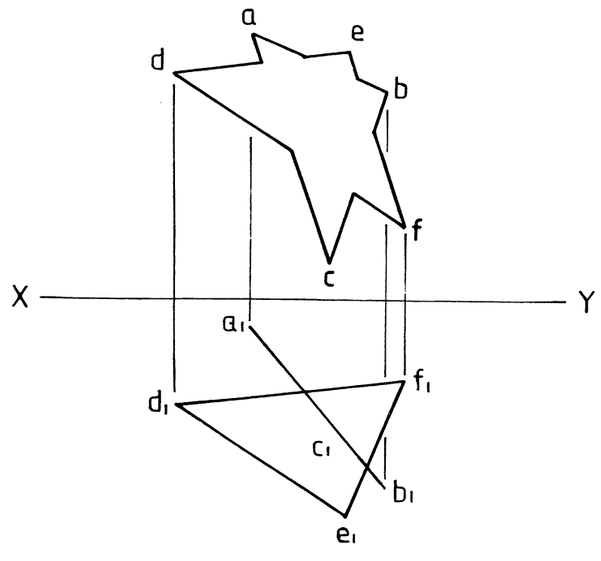
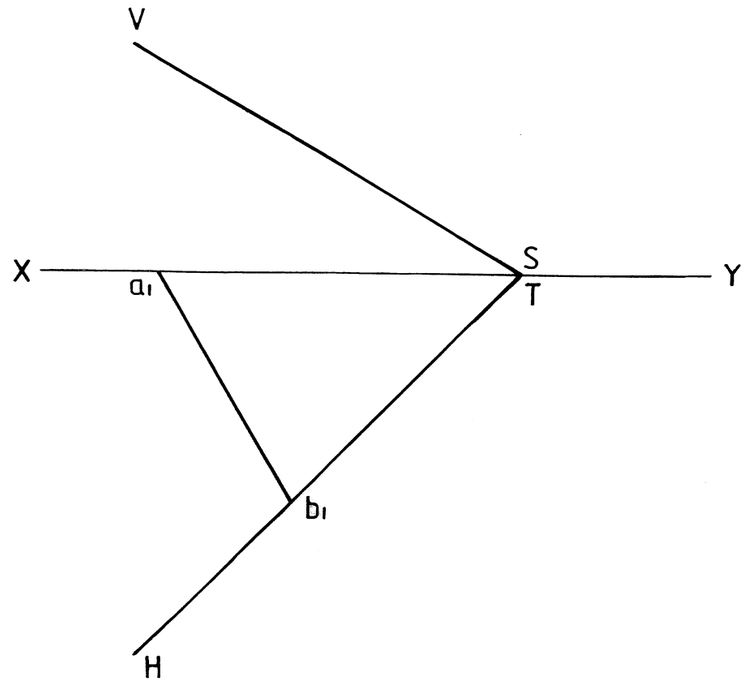


FIG. 1.4

VRAAG 1	PUNTE	
1.1 Maak gebruik van die volgende inligting in **FIG. 1.1** en voltooi die vooraansig en boaansig van lynstuk **AB.** 1.1.1 Geografiese ligging = S80°O, ware lengte = 40 mm en ware helling t.o.v. die **HV** = 20° opwaarts.	10	
1.2 Bepaal die boaansig van vlakfiguur **ABCD** wat op die skuinsvlak lê in **FIG. 1.2**.	4	
1.3 Bepaal die **VS** en die vooraansig van lynstuk **AB** wat in die skuinsvlak lê in **FIG. 1.3** indien die ware hoek van die skuinsvlak t.o.v. die **HV** = 40°.	9	
1.4 Bepaal die snyspoor (deurdringingslyn) en verborge detail tussen die twee vlakfigure getoon in **FIG. 1.4**.	7	
	30	



QUESTION 2

The traces **VTH** of an oblique plane and the top view of side **AB** of a triangular plane figure **ABC** contained in the oblique plane are given.
Point **C** is 20 mm above the **HP** and 20 mm to the left of **A**. The true length of sides **BC** and **AC** are 46 mm and 49 mm respectively. Point **B** rests on the **HP**.
A thin pin with length 20 mm is pierced perpendicularly through the centre of the plane figure **ABC** so that it protrudes 10 mm on each side.

MARKS

Determine

2.1 The true angle of inclination between plane figure **ABC** and the **HP**	4	
2.2 The true shape of plane figure **ABC**	4	
2.3 The true length of line segment **AB**	1	
2.4 The front view and the top view of plane figure **ABC** with the pin in position. Show the visibility of the pin in all the views.	16	
Tabulate all answers neatly.		
	25	

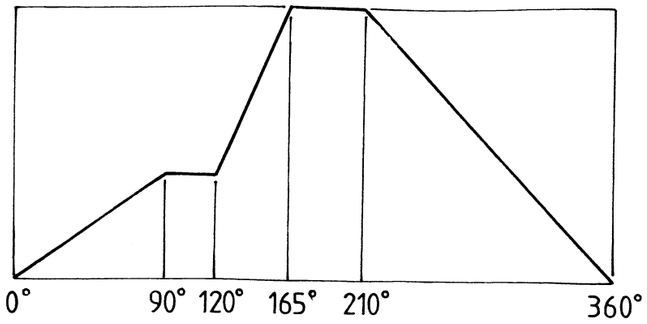
VRAAG 2

Die snyspore **VSH** van 'n skuinsvlak asook die boaansig van sy **AB** van 'n driehoekige vlakfiguur **ABC** wat in die skuinsvlak lê, word getoon.
Punt **C** is 20 mm bo die **HV** en 20 mm links van **A**. Die ware lengte van sye **BC** en **AC** is 46 mm en 49 mm respektiewelik. Punt **B** rus op die **HV**. 'n Dun pen met lengte 20 mm dring loodreg deur die middelpunt van vlakfiguur **ABC** sodat dit 10 mm aan elke kant uitsteek.

PUNTE

Bepaal

2.1 Die ware inklinasiehoek tussen vlakfiguur **ABC** en die **HV**	4	
2.2 Die ware vorm van vlakfiguur **ABC**	4	
2.3 Die ware lengte van lynstuk **AB**	1	
2.4 Die vooraansig en boaansig van vlakfiguur **ABC** met die pen in posisie. Toon die sigbaarheid van die pen in al die aansigte.	16	
Tabuleer alle antwoorde netjies.		
	25	



QUESTION 3 The displacement graph for a roller-ended follower is shown.	MARKS	
3.1 Draw the cam profile by making use of the following information: 3.1.1 Camshaft diameter = 15 mm 3.1.2 The maximum distance from the bottom of the roller follower to the camshaft centre is 67 mm. 3.1.3 The cam rotates clockwise. 3.1.4 Roller diameter = 10 mm. Show all rollers in position.	16	
3.2 Indicate the following on the displacement graph: 3.2.1 Displacement of the follower after 300° rotation	2	
3.2.2 The travel of the follower after 300° rotation	2	
Tabulate all answers.	**20**	

VRAAG 3 Die verplasingsgrafiek vir 'n rollervolger word getoon.	PUNTE	
3.1 Teken die nokprofiel deur die volgende inligting te gebruik : 3.1.1 Nokasdiameter = 15 mm 3.1.2 Die maksimum afstand tussen die onderkant van die rollervolger en die middelpunt van die nokas = 67 mm. 3.1.3 Die nok roteer kloksgewys. 3.1.4 Rollerdiameter = 10 mm. Toon al die rollers in posisie.	16	
3.2 Toon die volgende aan op die verplasingsgrafiek: 3.2.1 Verplasing van die nokvolger na 300° rotasie	2	
3.2.2 Die slag van die volger na 300° rotasie	2	
Tabuleer alle antwoorde.	**20**	

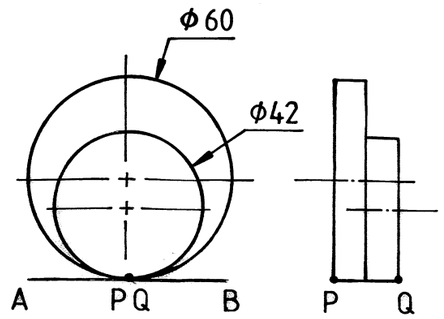


FIG. 4.2

Calculations / Berekeninge

Name / Benoem

QUESTION 4

FIG. 4.2 shows two wheels that roll along horizontal plane **AB** shown in **FIG. 4.1**. Both wheels start at the same point and rotate in the same direction. Complete **FIG. 4.1** by using the given dimensions.

Determine:

4.1 The curves of point **P** placed on the big wheel completing one revolution and point **Q** placed on the small wheel completing one and a half revolutions. 22

4.2 Measure the perpendicular height of **P** above plane **AB** where **Q** again coincides with plane **AB**. 2

4.3 Show all calculations and name the loci generated. 6

30

VRAAG 4

FIG. 4.2 toon twee wiele wat oor die horisontale vlak **AB** rol soos in **FIG. 4.1** getoon word. Albei wiele begin op dieselfde punt en roteer in dieselfde rigting. Voltooi **FIG. 4.1** deur die gegewe afmetings te gebruik.

Bepaal:

4.1 Die krommes van punt **P** geplaas op die groot wiel vir een omwenteling voltooi en punt **Q** geplaas op die klein wiel vir een en 'n halwe omwenteling voltooi. 22

4.2 Meet die loodregte hoogte van punt **P** bo vlak **AB** wanneer punt **Q** weer vlak **AB** raak. 2

4.3 Toon alle berekeninge en benoem die lokusse gevorm. 6

30

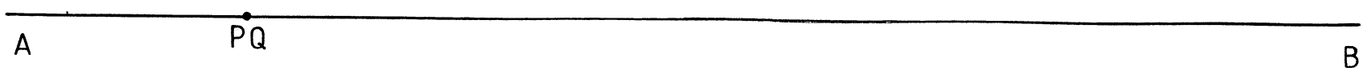
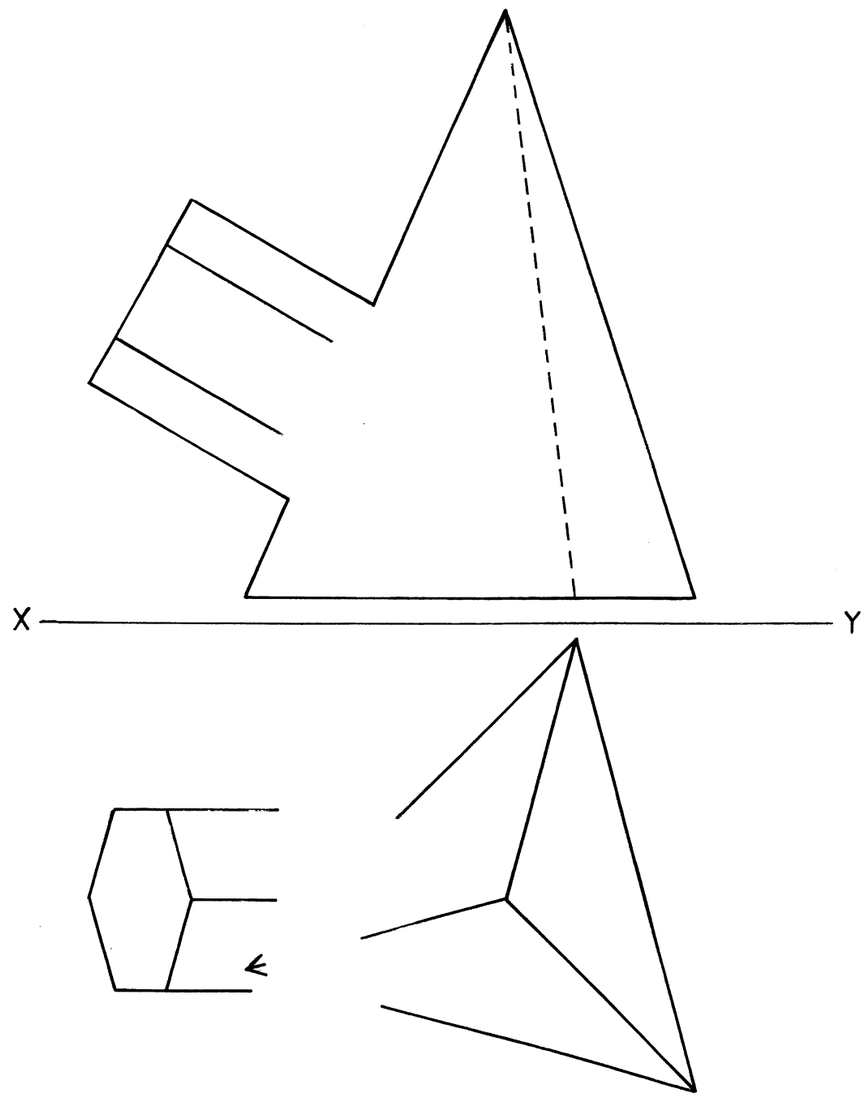


FIG. 4.1

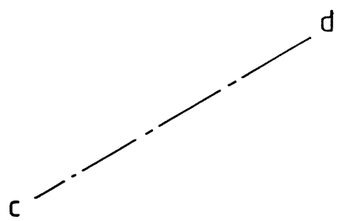


QUESTION 5	MARKS
Shown are the incomplete front view and top view of a triangular pyramid and a hexagonal prism as branch connection.	
Determine: 5.1 The interpenetration curve in the front view. 19 5.2 The interpenetration curve in the top view. 11 Show all the hidden detail in both views.	
	30

VRAAG 5	PUNTE
Getoon is die onvoltooide vooraansig en boaansig van 'n driehoekige piramide en 'n seshoekige prisma as takpyp.	
Bepaal: 5.1 Die deurdringingskromme in die vooraansig. 19 5.2 Die deurdringingskromme in die boaansig. 11 Toon alle verborge detail in beide aansigte.	
	30

QUESTION 6 **FIG. 6.1** shows the axis **CD** of a regular hexagonal prism with base sides 20 mm as well as the cutting plane **A–A.**	MARKS	
Determine: 6.1 An auxiliary view showing a true view of the prism and true length of the axis **CD.** Also show the true shape of the base of the prism. Please note: Side **MN** shown in **FIG. 6.2** must be placed nearest (closest) to the **VP**. 6.2 A sectional front view on cutting plane **A–A** 6.3 The top view	7 10 13	
	30	

VRAAG 6 **FIG. 6.1** toon die as **CD** van 'n reëlmatige seshoekige prisma met basissye 20 mm asook die snyvlak **A–A**.	PUNTE	
Bepaal: 6.1 'n Hulpaansig wat die ware aansig van die prisma en die ware lengte van die as **CD** toon, asook die ware vorm van die basis van die prisma. Let wel: Sy **MN** soos getoon in **FIG. 6.2** moet die naaste aan die **VV** geplaas word. 6.2 'n Deursnee-vooraansig op snyvlak **A–A** 6.3 Die boaansig	7 10 13	
	30	



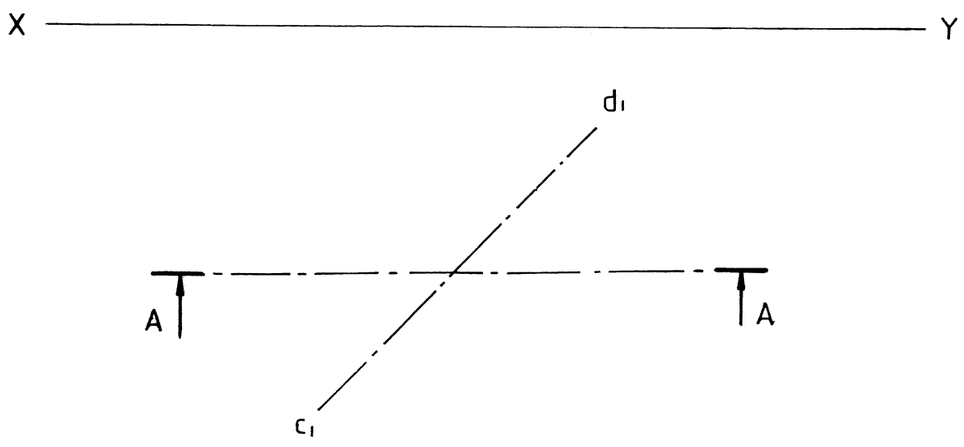


FIG. 6.1

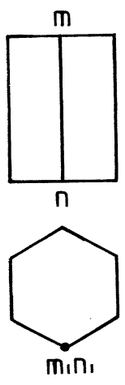
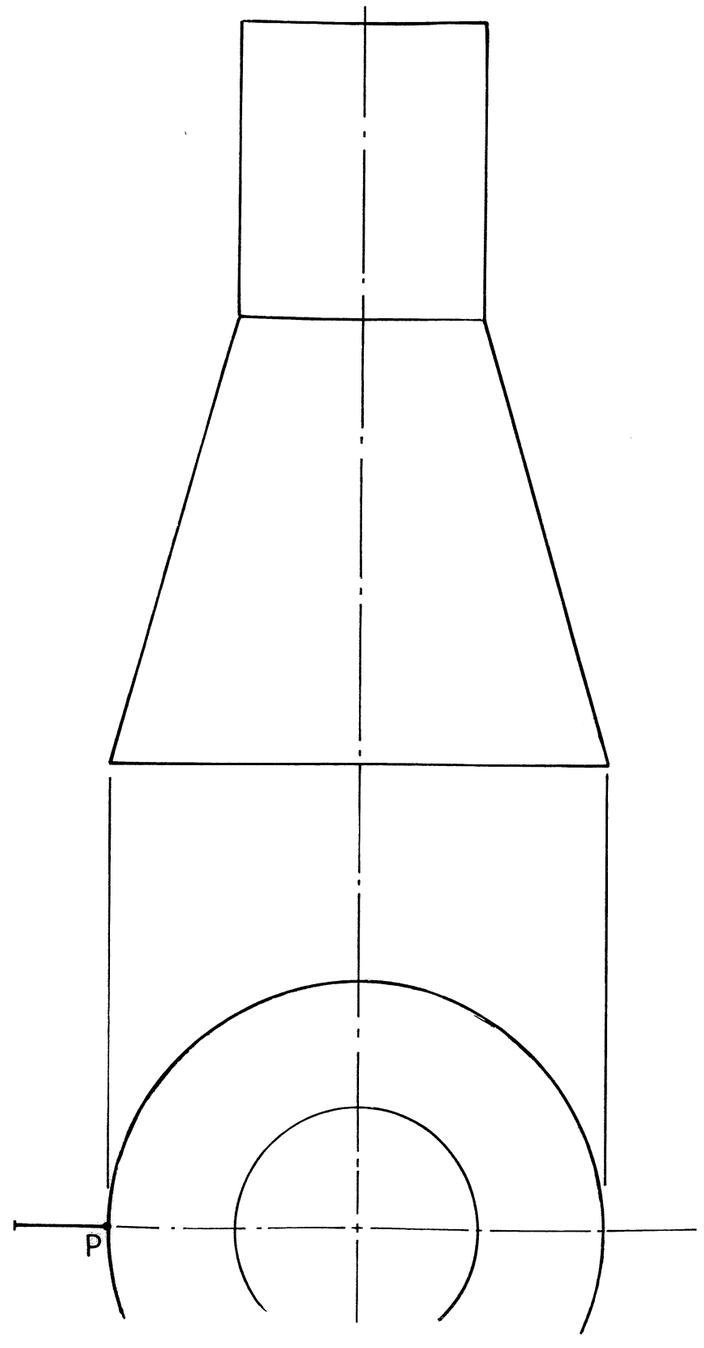


FIG. 6.2



QUESTION 7	MARKS
The front view and the top view of a truncated cone with a cylinder placed on top of the cone is shown. The top view shows a point **P**.	
Determine: 7.1 The front view of a right-handed auger starting at point **P** completing one and a half revolutions to the top of the cone and one revolution to the top of the cylinder. The width of the auger is 15 mm. No hidden detail must be shown but all constructions must be shown.	**25**

VRAAG 7	PUNTE
Die vooraansig en boaansig van 'n afgeknotte kegel met 'n silinder wat bo-op die kegel pas, word getoon. Die boaansig toon punt **P**.	
Bepaal: 7.1 Die vooraansig van 'n regterhandse awegaar wat by punt **P** begin deur een en-'n-halwe omwenteling te voltooi tot die bokant van die kegel en een omwenteling tot die bokant van die silinder. Die wydte van die awegaar is 15 mm. Geen verborge detail hoef getoon te word nie, maar alle konstruksies moet getoon word.	**25**

EXAMINATION NUMBER / EKSAMENNOMMER 8 0 6

ANSWER SHEET / ANTWOORDVEL 7 QUESTION / VRAAG 7

END / EINDE

TOTAL / TOTAAL : 200