education

Department:
Education
REPUBLIC OF SOUTH AFRICA

INSTRUCTIONS AND INFORMATION

1. The 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 drawn to scale 1:1, unless otherwise stated.
5. The questions must be answered on the answer sheets provided.
6. All the answer sheets must be re-stapled in numerical sequence and handed in irrespective of whether the question was attempted or not.
7. Careful time management is essential in order to complete all the questions.
8. Print your examination number in the block provided on every answer sheet.
9. All answers must be drawn accurately and neatly.
10. Any details or dimensions not given must be assumed in good proportion.

NATIONAL SENIOR CERTIFICATE

GRADE 11

ENGINEERING GRAPHICS AND DESIGN P2

EXEMPLAR PAPER 2007

MARKS: 100

TIME: 2 hours

This question paper consists of 6 pages.

FOR OFFICIAL USE ONLY							
					MODERATED MARK		
1							
2							
3							
4							
TOTAL							

LEVEL	CHECKED BY

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

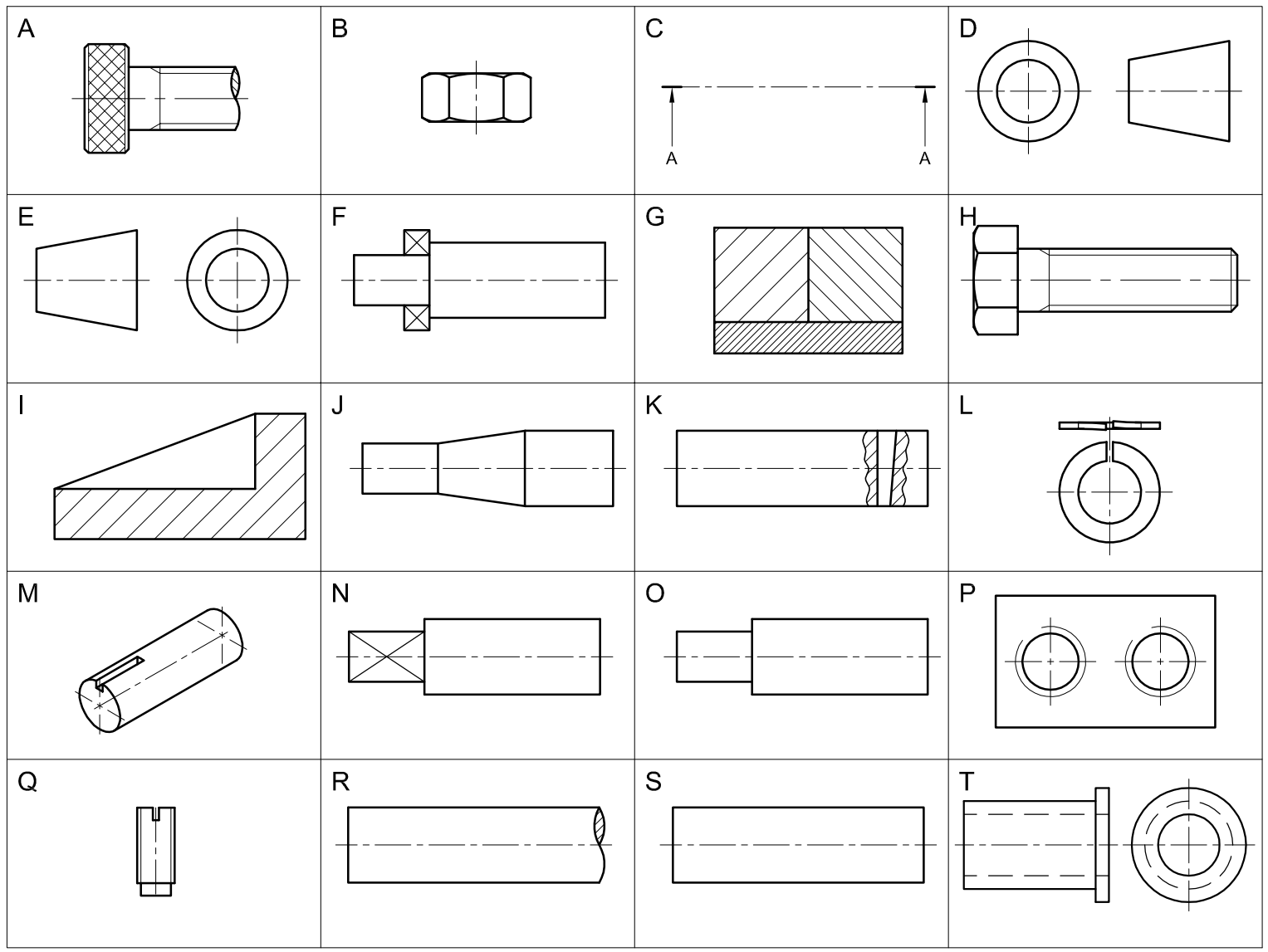
STAPLE

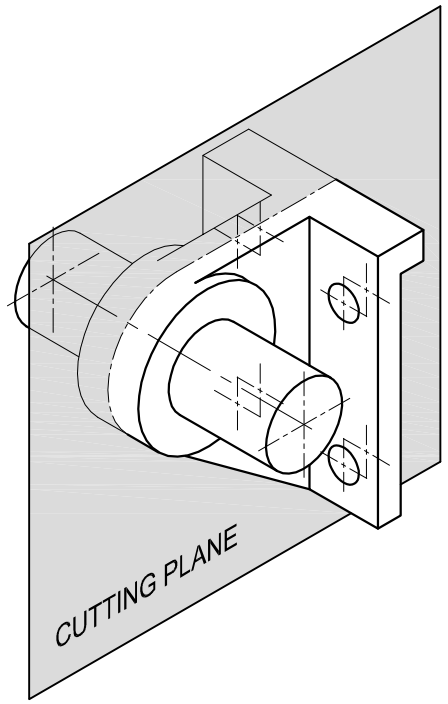
QUESTION 1A: MATCH THE TERMS

Given:
A table of descriptions and a table with the graphics of a number of common mechanical features.

Instructions:
- Select the feature from the graphics below that best fits the description then place the number in the table.
- Only use each feature ONCE. **[10]**

Complete the table below by filling in the number of the matching feature to the description in the column provided.			
1. A cutting plane		11. A shoulder on a shaft	
2. A grub screw		12. A full section	
3. A square on a shaft		13. A bolt	
4. Third-angle orthographic projection symbol		14. Internal screw threads	
5. A keyway in a shaft		15. First-angle orthographic projection symbol	
6. Hatching adjacent parts		16. A bearing	
7. Diamond knurling		17. A bush	
8. A taper on a shaft		18. A nut	
9. An S-break		19. A part section	
10. A spring washer		20. A shaft	





QUESTION 1B: FREEHAND DRAWING

Given:
A pictorial view of a bracket and a shaft assembly, with a cutting plane passing through them.

Instructions:
- Convert the pictorial drawing into an orthographic drawing. Draw TWICE the size, and in neat freehand, the sectional front view that will be created by the cutting plane passing through the assembly.

[10]

ASSESSMENT CRITERIA

SIZE AND PROPORTION	= 1
OUTLINE	= 5
CENTRE LINE	= 2
HATCHING	= 2
TOTAL	**= 10**

EXAMINATION NUMBER	
EXAMINATION NUMBER	2

STAPLE

QUESTION 2: LOCI (HELIX)

A farmer needs to replace some of his old fence poles with new ones. He knows from past experience that to dig the holes for the poles is a time consuming job. He decides to design a tool that can help him speed up the job of digging the holes. He applies the design of a helix to make a tool that will help him drill holes into the ground.

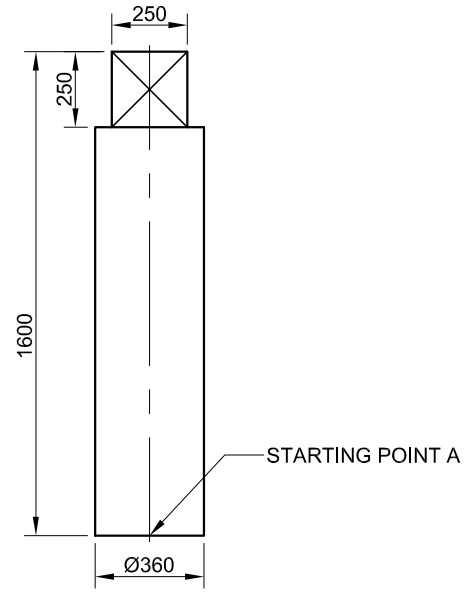
Given:
The inner shaft of the tool and the starting point for an auger.

Specifications:
The lead (ONE full turn) is 480 mm.
The inner diameter of the auger is 360 mm.
The outer diameter of the auger is 900 mm.

Instructions:
- Draw the given shaft to scale 1:10.
- Draw TWO full turns of a right-hand auger starting at position (A) indicated in the front of the shaft.
- Show ALL necessary construction.
- NO hidden detail is required.

[20]

A



SHAFT DETAIL AND STARTING POINT

ASSESSMENT CRITERIA

GIVEN	= 5
CENTRE LINE	= 1
CONSTRUCTION	= 4
HELIX	= 10
TOTAL	**= 20**

EXAMINATION NUMBER	
EXAMINATION NUMBER	3

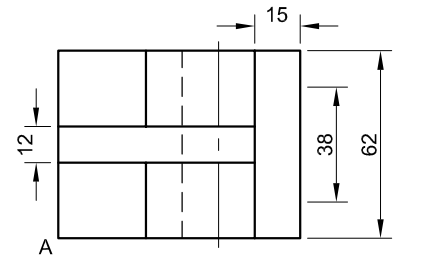
STAPLE

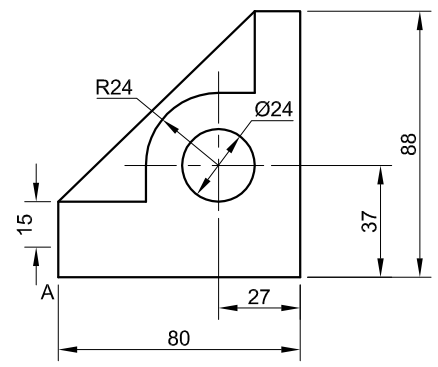
QUESTION 3: ISOMETRIC DRAWING

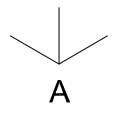
Given:
The front view and top view of a rod guide bracket.

Instructions:
- Convert the orthographic views of the rod guide bracket into an isometric drawing.
- Make corner A the lowest point of the drawing.
- NO hidden detail is required.
- Show ALL necessary construction.

[20]







ASSESSMENT CRITERIA

LINES	= 13
CENTRE LINE	= 1
CIRCLES	= 6
TOTAL	**= 20**

EXAMINATION NUMBER

EXAMINATION NUMBER | 4

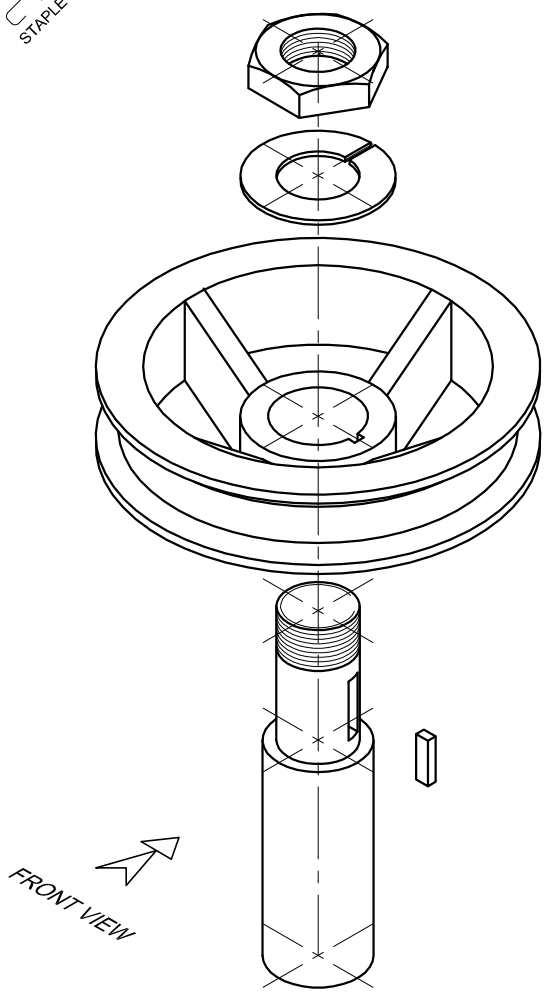
STAPLE

ANSWER SHEET 4

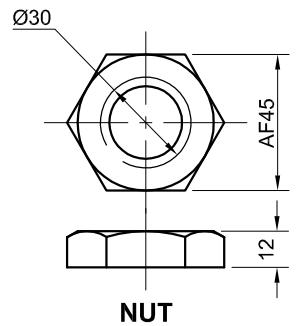
MARKING CRITERIA						
	FACETS		SECTIONING		TOTAL	
	POSSIBLE	OBTAINED	POSSIBLE	OBTAINED	POSSIBLE	OBTAINED
NUT	4		1		5	
WASHER	1		1		2	
KEY	1		1		2	
PULLEY	13		3		16	
SHAFT	7		2		9	
CENTRE LINE + AUX VIEW					1	
ASSEMBLY					4	
LABEL					1	
TOTAL					40	

EXAMINATION NUMBER	
EXAMINATION NUMBER	5

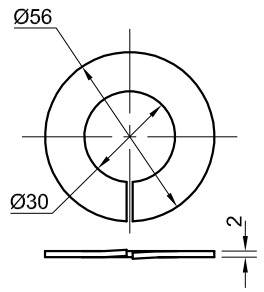
STAPLE



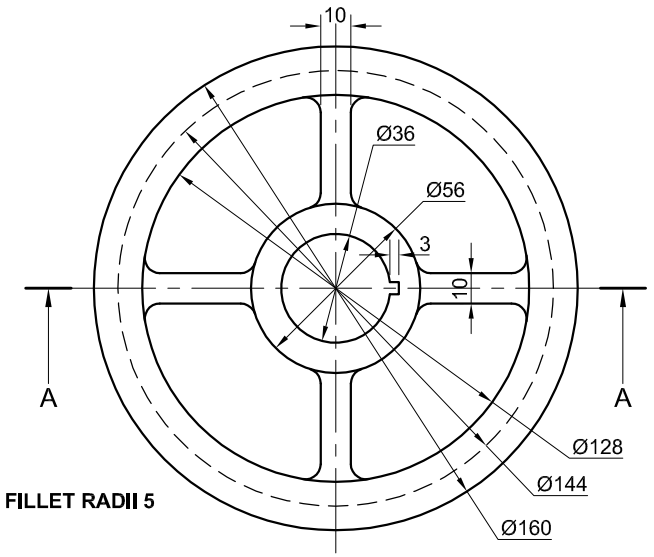
EXPLODED ISOMETRIC VIEW



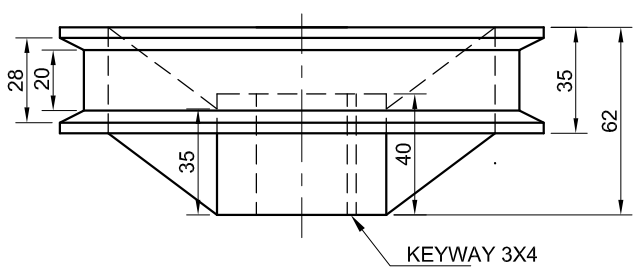
NUT



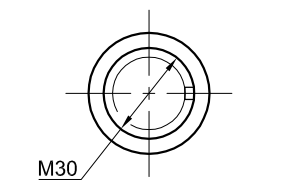
SPRING WASHER

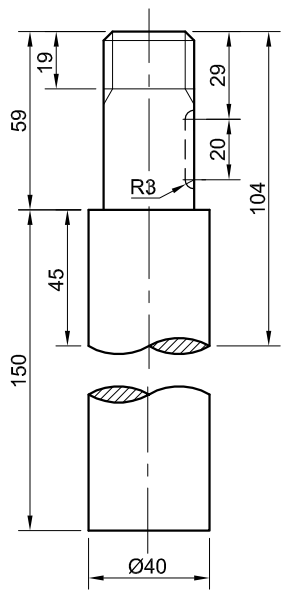


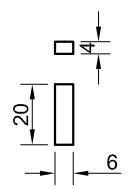
ALL FILLET RADII 5



PULLEY







KEY

SHAFT

QUESTION 4: ASSEMBLY

Given:
The exploded isometric drawing of the components of a pulley sub-assembly showing the position of each component relative to the others.

Orthographic views of each component of the pulley sub-assembly.

Instructions:
Answer this question on ANSWER SHEET 4:
- Draw to scale 1:1 a full sectional front view of the assembled components of the pulley as seen from the direction of the arrow, indicated in the exploded isometric drawing
- Label the sectioned view: SECTION ON A-A

Note:
- The cutting plane passes through the vertical centre line of the assembly as indicated on the pulley.
- Only the top 104 mm of the shaft must be drawn. Draw an S-break at the shortened end.
- ALL drawing must comply with the standards contained in the *SABS 0111.*

[40]

PARTS LIST		
PART	QUANTITY	MATERIAL
NUT	1	MILD STEEL
SPRING WASHER	1	SPRING STEEL
PULLEY	1	CAST IRON
KEY	1	MILD STEEL
SHAFT	1	STEEL

STEEL WORKS

TITLE: PULLEY ASSEMBLY

DRAWN:	STEVE	DATE:	20-08-06	CAD:	AutoCAD
CHECK:	PHIL	DATE:	24-08-06	DWG NO:	DoE-NOV-007-001
ENGINEER:	SAREL				
REVISION:	03				
SCALE:	1:20				