

**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

A view of the assembled pipe wrench, third-angle orthographic views of the parts of the pipe wrench, a title block and a table of questions. The drawings are not presented to the indicated scale.

**Instructions:**

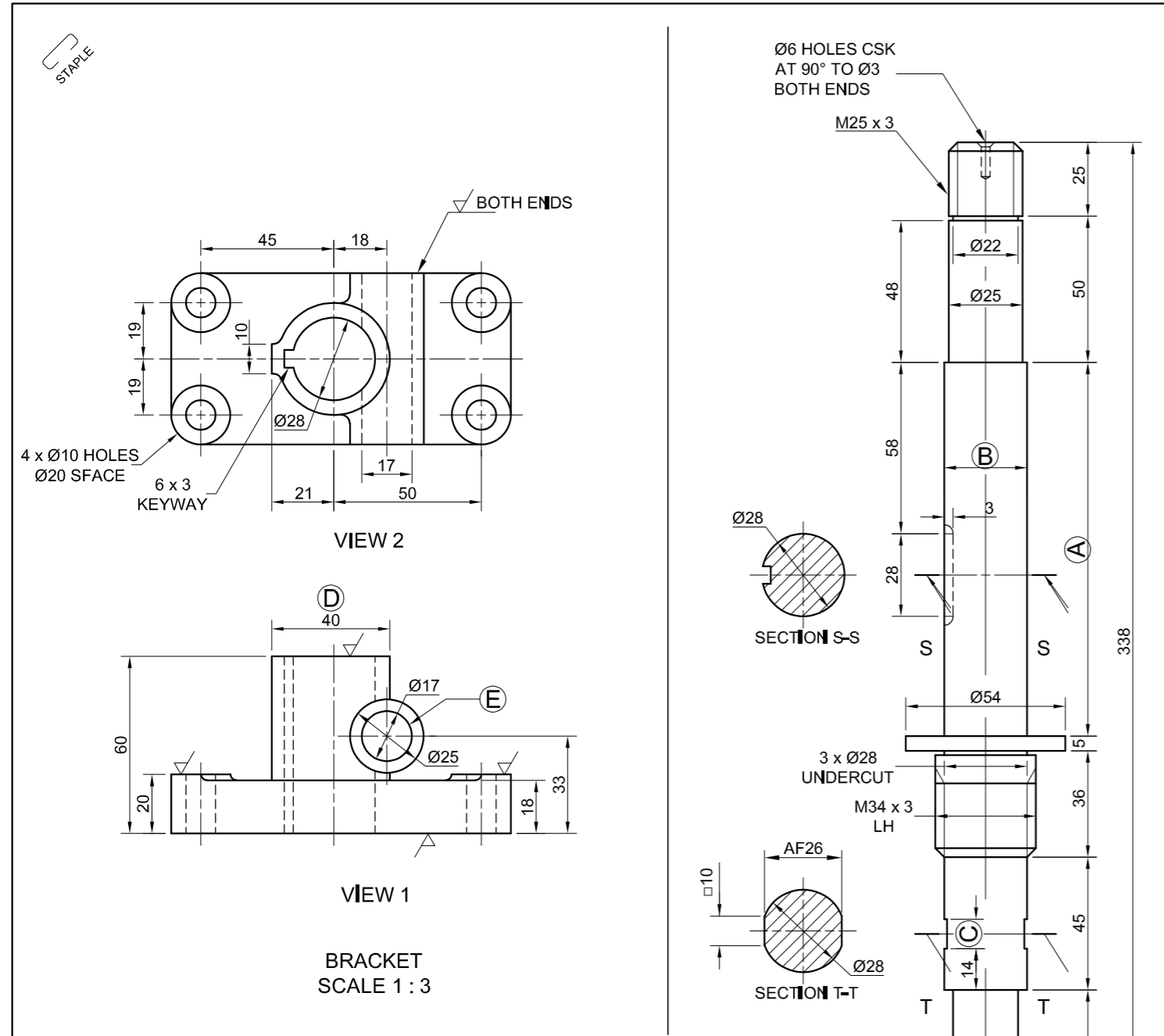
Complete the table below by neatly answering the questions, which refer to the accompanying drawings, the title block and mechanical content. [30]

QUESTIONS		ANSWERS	
1	In which street is the manufacturer situated?	1	
2	What was done by Charles on 16/08/2022?	1	
3	What is the file name?	1	
4	What conventional representation is indicated by the break lines at A?	1	
5	What heating process is used for the tempering?	1	
6	What type of section is SECTION S-S?	1	
7	What type of section is shown in DETAIL T?	1	
8	Determine the complete dimensions at: B: C: D: E:	4	
9	Measure the angle at F.	1	
10	What is the depth of the teeth at G?	1	
11	What does the double-dash chain line at H indicate?	1	
12	How many surfaces on the pipe wrench must be machined?	1	
13	What does the abbreviation NTS stand for?	1	
14	If VIEW 1 is the front view of the handle, what would VIEW 2 be called?	1	
15	How many parts make up the pipe wrench assembly?	1	
16	With reference to the tolerance, determine the minimum and the maximum dimension at J.	2	
17	What is the direction of lay that is indicated by the machining symbol?	1	
18	What does the 0.2 on the machining symbol indicate?	1	
19	In the space below (ANSWER 19), redraw, in neat freehand and to the same size, the given end of a stud as a SANS 10111 conventional representation.	4 1/2	
20	In the space below (ANSWER 20), draw, in neat freehand, the symbol for the projection system used.	3 1/2	
<b>TOTAL</b>		<b>30</b>	

FILE NAME: SCGG213	DRAWING No. WRC13	TOLERANCE: +0,23 -0,10	JJ HAND TOOLS CC www.toolsc.co.za CELL: 090 314 5839 84 SHARK STREET DURBAN 0110	HEAT TREATMENT: TEMPERING = 860° WITH INDUCTION HEATING
DRAWING PROGRAM: AUTOCAD 2022		SCALE 1 : 3	ALL UNSPECIFIED RADII ARE R4.	
DRAWN BY:	NOMVUNDO	DATE: 02/07/2022	TITLE: PIPE WRENCH ASSEMBLY	
CHECKED BY:	CHRIS	DATE: 09/08/2022		
APPROVED BY:	CHARLES	DATE: 16/08/2022		

ANSWER 19	ANSWER 20
DETAILED REPRESENTATION	CONVENTIONAL REPRESENTATION
SYMBOL	
EXAMINATION NUMBER	
EXAMINATION NUMBER	





**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**  
Two views of a bracket, and a view of a shaft, a title block and a table of questions. The drawings are not presented to the indicated scale.

**Instructions:**  
Complete the table below by neatly answering the questions, which refer to the accompanying drawings, the title block and mechanical content. [30]

QUESTIONS		ANSWERS	
1	Who checked the drawing?	1	
2	How many revisions have been made?	1	
3	From what material must the shaft be manufactured?	1	
4	How many holes are there in the bracket?	1	
5	What type of sections are S-S and T-T of the shaft?	1	
6	How many screw threads must be cut on the shaft?	1	
7	If VIEW 2 of the bracket is the front view, what would VIEW 1 be called?	1	
8	What does the abbreviation AF stand for?	1	
9	What is the abbreviation for countersunk?	1	
10	Determine the complete dimensions at: A: B: C:	3	
11	What is the height of the spot face on the bracket?	1	
12	What is the depth of the keyway on the shaft?	1	
13	If scale 1 : 1 was used, what would the dimension at D read?	1	
14	With reference to the orthographic system used, on which side of the truncated cone of the projection symbol would the two circles be drawn?	1	
15	Specify the size and depth for the left-hand thread.	1	
16	How many surfaces on the bracket must be machined?	1	
17	With reference to the tolerance, determine the minimum diameter of the hole at E.	2	
18	With reference to the machining symbol in the title block, what do the following component specifications refer to?	0,2	1
		0,8	1
		GRINDING	1
19	In the space below (ANSWER 19), complete, in neat freehand, the SANS 10111 conventional representation for the given holes on a LINEAR PITCH.	C	1
			3
20	In the space below (ANSWER 20), complete, in neat freehand, the SANS 10111 conventional representation for an INTERRUPTED VIEW on a square bar.	3	
<b>TOTAL</b>		<b>30</b>	

4			
3	CHANGE TOLERANCE TO ± 0,02	09/12/2021	J. STEYN
2	ADD SECTIONS ON SHAFT	08/12/2021	J. STEYN
1	CHANGE INDICATED DIMENSIONS	06/12/2021	J. STEYN
REVISION	DESCRIPTION	DATE	DRAWN

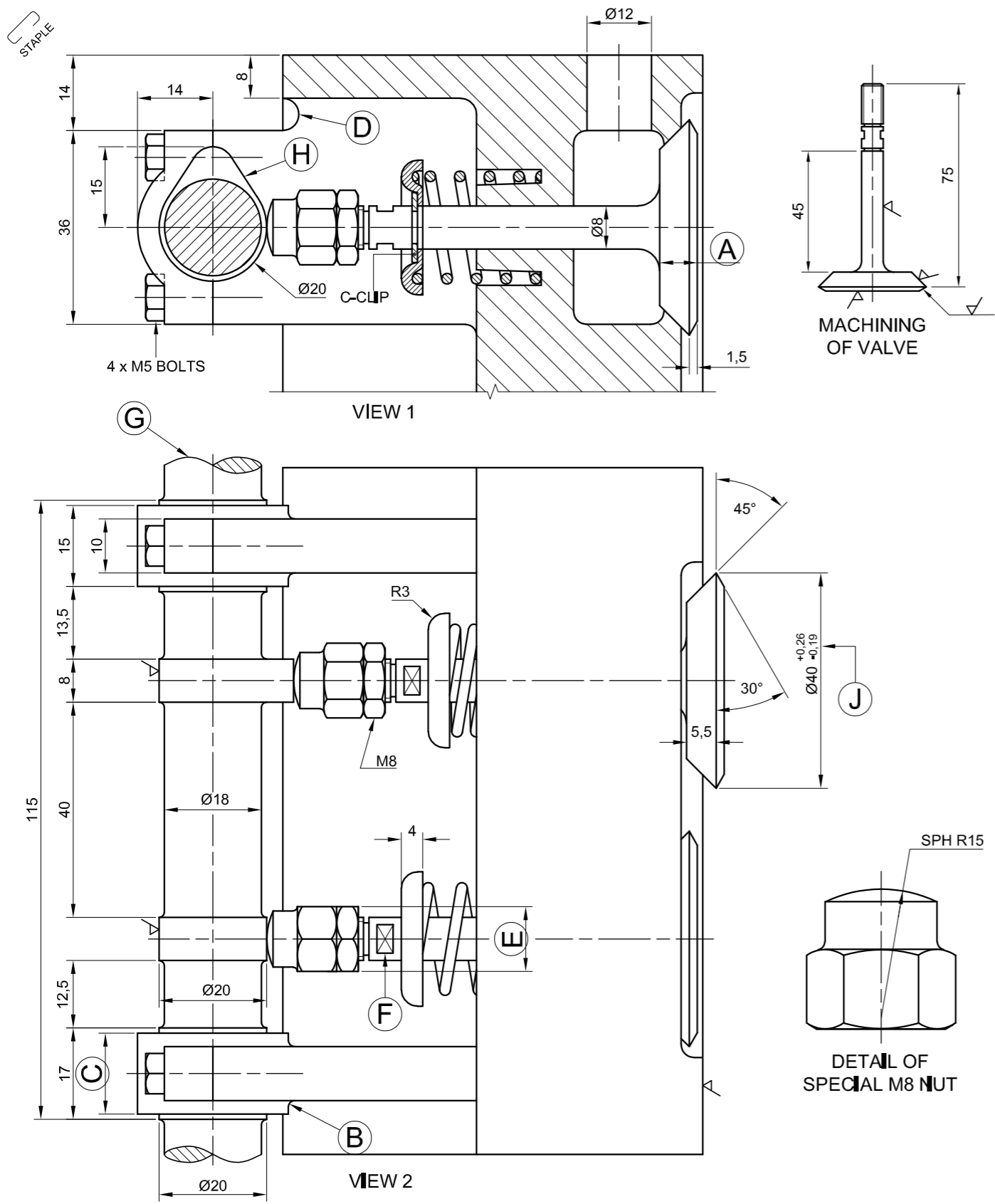
FILE NAME: MS - 11 - 2022	MATERIAL: • BRACKET : WROUGHT IRON • SHAFT: MILD STEEL	ALL UNSPECIFIED RADII ARE 3 mm	TOLERANCE: ± 0,02 UNLESS OTHERWISE STATED	GRINDING 0,8 0,2√C
DRAWING No. 13				
COMMISSIONED BY: RACK IT MANUFACTURERS	DRAWING PROGRAMME: AUTOCAD 2022	ALL DIMENSIONS ARE IN MILLIMETRES,		
		QUANTITY: 3000	SCALE 1 : 3	
MILLER DESIGN AND DETAILING 1 ANFIELD PLACE LIVERPOOL X600 www.millerd&d.co.za 012 567 8910		DRAWN BY: J. BONGANI	DATE: 2021/12/04	
		CHECKED: S. SMITH	DATE: 2021/12/12	
		APPROVED BY: J. BHIKA	DATE: 2021/12/17	
TITLE: <b>BRACKET AND SHAFT</b>				

QUESTION 19: ANSWER 20:

DETAILED

CONVENTION

EXAMINATION NUMBER	
EXAMINATION NUMBER	2



**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Two sectional views of a cylinder head sub-assembly, a detailed view of a valve, a title block and a table of questions. The drawing is not presented to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions which refer to the accompanying drawing, the title block and mechanical content. [30]

QUESTIONS		ANSWERS	
1	What is the name of the manufacturing company?	1	
2	Who approved the drawing?	1	
3	How many sets of drawings are there for this sub-assembly?	1	
4	On what date was the drawing prepared?	1	
5	Referring to the projection symbol, what is the projection system used?	1	
6	Which drawing program was used to prepare the drawing?	1	
7	What size bolts are required for the sub-assembly?	1	
8	How many coil springs are there in this sub-assembly?	1	
9	Determine the complete dimensions at: A:          B:          C:          D:          E:	5	
10	What is the radius of the spherical cap?	1	
11	What does the convention at F indicate?	1	
12	What does the convention at G indicate?	1	
13	What machining method must be used on the machined surfaces?	1	
14	With reference to the tolerance, determine the minimum dimension at J.	1	
15	With reference to the CAM at H, determine the displacement of the follower.	1	
16	If VIEW 1 is the SECTIONAL FRONT VIEW, what is VIEW 2 called?	1	
17	How many surfaces on this sub-assembly require machining?	1	
18	Insert the cutting plane for VIEW 1 on VIEW 2 and label it A-A.	3 1/2	
19	In the space below (ANSWER 19), draw, in neat freehand, the complete SANS 10111 conventional representation of a COIL SPRING.	3	
20	On the drawing below (ANSWER 20), draw, in neat freehand, the complete SANS 10111 conventional representation for DIAMOND KNURLING.	2 1/2	
<b>TOTAL</b>		<b>30</b>	

FILE NAME: JBVW101	DRAWING No. CAM12	DRAWING SET: 1 OF 4	MC ENGINEERING WORKS www.cheads.co.za    CELL: 090 714 4322 44 DIESEL STREET KIMBERLEY 0220	GRINDING 3,2 0,55
DRAWING PROGRAM: AUTOCAD 2021		SCALE 1 : 1	ALL UNSPECIFIED RADII ARE R2.	
DRAWN:	VUSI	DATE: 02/04/2021		
CHECKED:	TARYN	DATE: 03/05/2021		
APPROVED:	GERALD	DATE: 02/07/2021		
			<b>TITLE</b>	<b>CYLINDER HEAD SUB-ASSEMBLY</b>

ANSWER 19

COMPLETE CONVENTIONAL REPRESENTATION OF A COIL SPRING

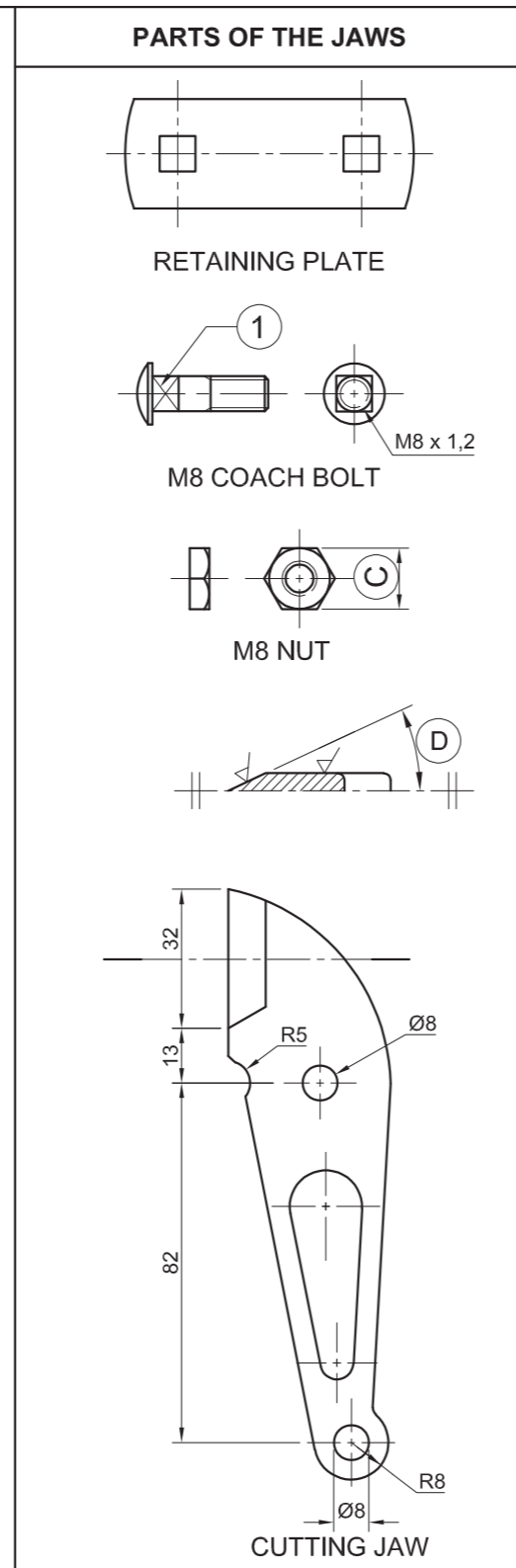
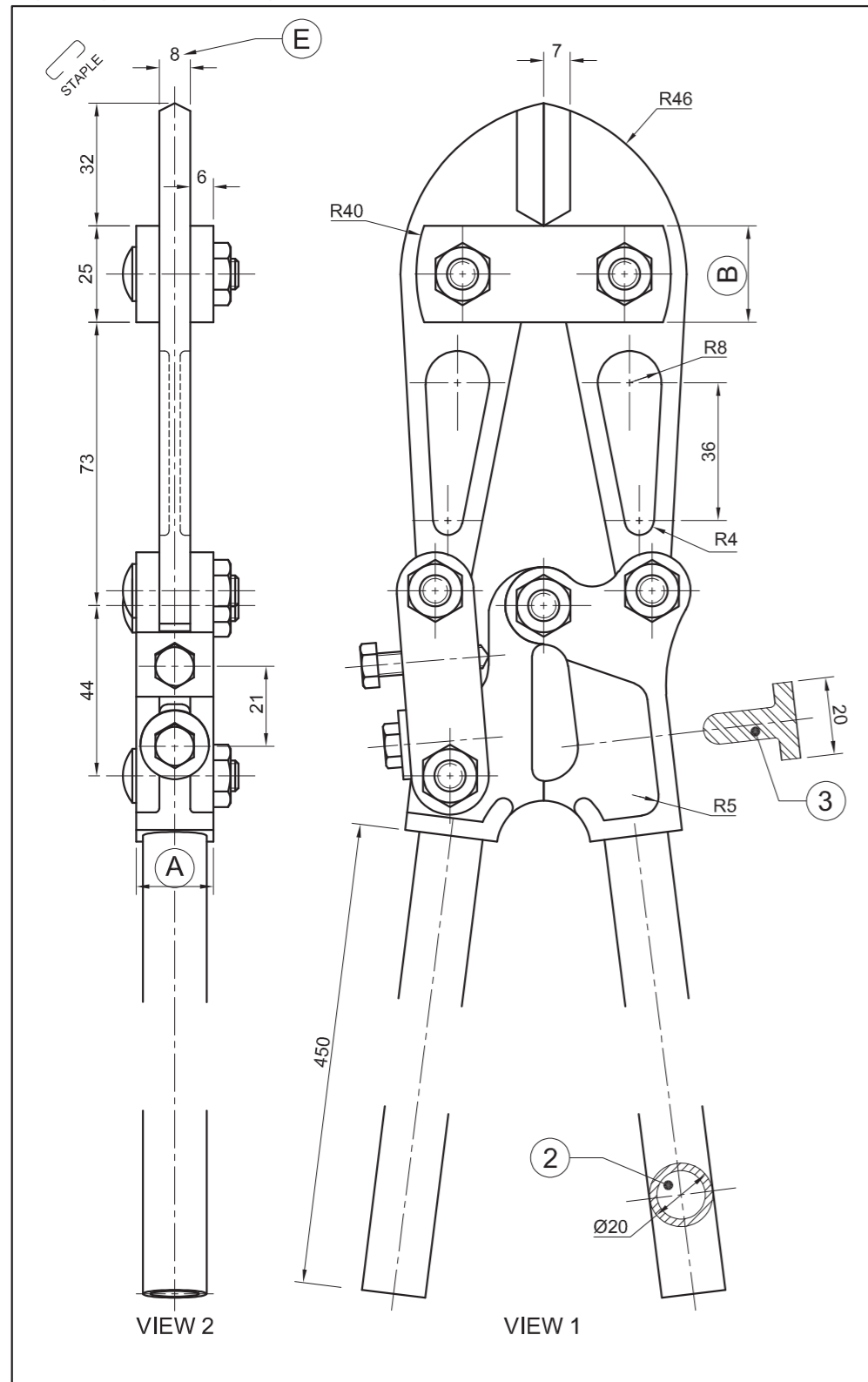
ANSWER 20

CONVENTIONAL REPRESENTATION OF DIAMOND KNURLING

EXAMINATION NUMBER

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EXAMINATION NUMBER



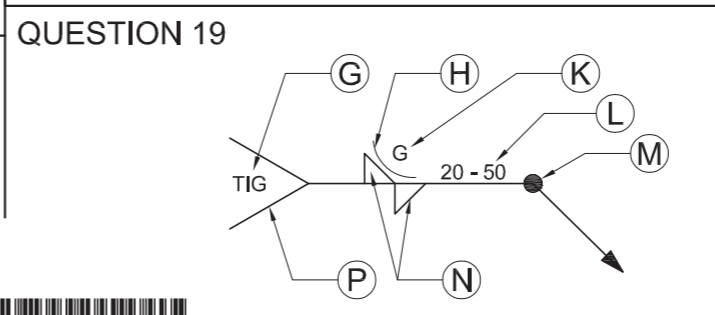
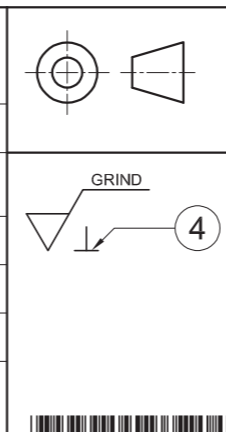
**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**  
The incomplete front view and left view of a bolt cutter, views of the parts of the jaws, a title block and a table of questions. The drawings are not presented to the indicated scale.

**Instructions:**  
Complete the table below by neatly answering the questions, which refer to the accompanying drawings, the title block and mechanical content. [30]

QUESTIONS		ANSWERS	
1	What was Aldin responsible for?	1	
2	What is indicated by the number WVJ-2021-091?	1	
3	Who is the client that commissioned the project?	1	
4	What is the radius of all unspecified curves?	1	
5	What is VIEW 2 called?	1	
6	How many cutting jaws will be required for the full order?	1	
7	How many M8 nuts are required for each bolt cutter?	1	
8	What is indicated by the cross at 1?	1	
9	What type of section is indicated at 2?	1	
10	Determine the complete dimension at: A: B: C:	3	
11	Measure the angle at D.	1	
12	Determine the total length of the cutting jaw.	1	
13	What is the specified depth of the thread on the M8 coach bolt?	1	
14	Complete the cutting plane on the cutting jaw by inserting the arrows. Label the cutting plane K-K.	3	
15	How many surfaces of the cutting jaw must be machined?	1	
16	Referring to the machining symbol in the title block, what is indicated by the symbol at 4?	1	
17	Describe the mistake at 3.	1	
18	With reference to the tolerance, determine the minimum dimension at E.	1	
19	With reference to the welding symbol below (QUESTION 19), match the letter on the symbol with the correct label in the column to the right of this question.	TAIL	1
		CONTOUR	1
		WELDING PROCESS	1
		FINISH SYMBOL	1
20	Complete, in neat freehand, the pipe below (ANSWER 20), by adding the SANS 10111 convention for an interrupted view, as required for the gaps in the handles of the bolt cutter.	WELDING PITCH/SPACING	1
		<b>TOTAL</b>	<b>30</b>

FILE NAME: WVJ - 2021-091	MATERIAL: STEEL	ALL UNSPECIFIED RADII ARE 3 mm	TOLERANCE: +0,32 -0,21
DRAWING No. 11	SCALE 1 : 4	ALL DIMENSIONS ARE IN MILLIMETRES	
COMMISSIONED BY: CUT BOLT MANUFACTURERS, EDMOND ST, SPRINGS	DRAWING PROGRAMME: AUTOCAD 2021	QUANTITY: 1 000 BOLT CUTTERS	
<b>SIEDA DRAUGHTING CC</b> 63 STANNARD CRESCENT HENNOPS PARK 9669	www.siedadraw.co.za 020 321 4567	DRAWN BY: RAY CHECKED BY: ALDIN APPROVED BY: WESLEY	DATE: 2021-01-08 DATE: 2021-02-01 DATE: 2021-03-05
TITLE	<b>BOLT CUTTER</b>		



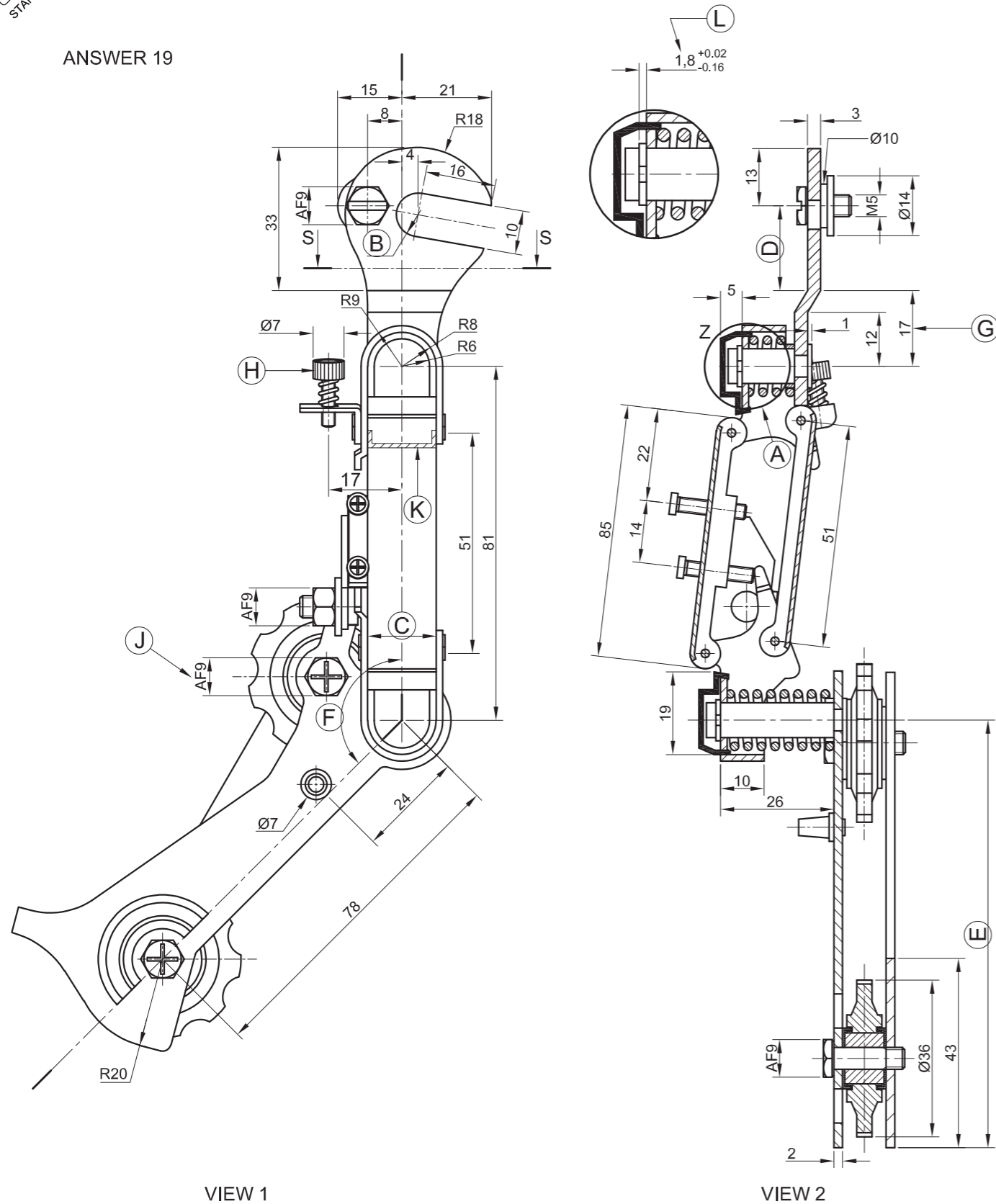
**ANSWER 20**

EXAMINATION NUMBER	
EXAMINATION NUMBER	2





ANSWER 19



**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Two views of a rear derailleur assembly for a bicycle, a detailed enlargement, a title block and a table of questions. The drawing is not presented to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions which refer to the accompanying drawing, the title block and mechanical content. [30]

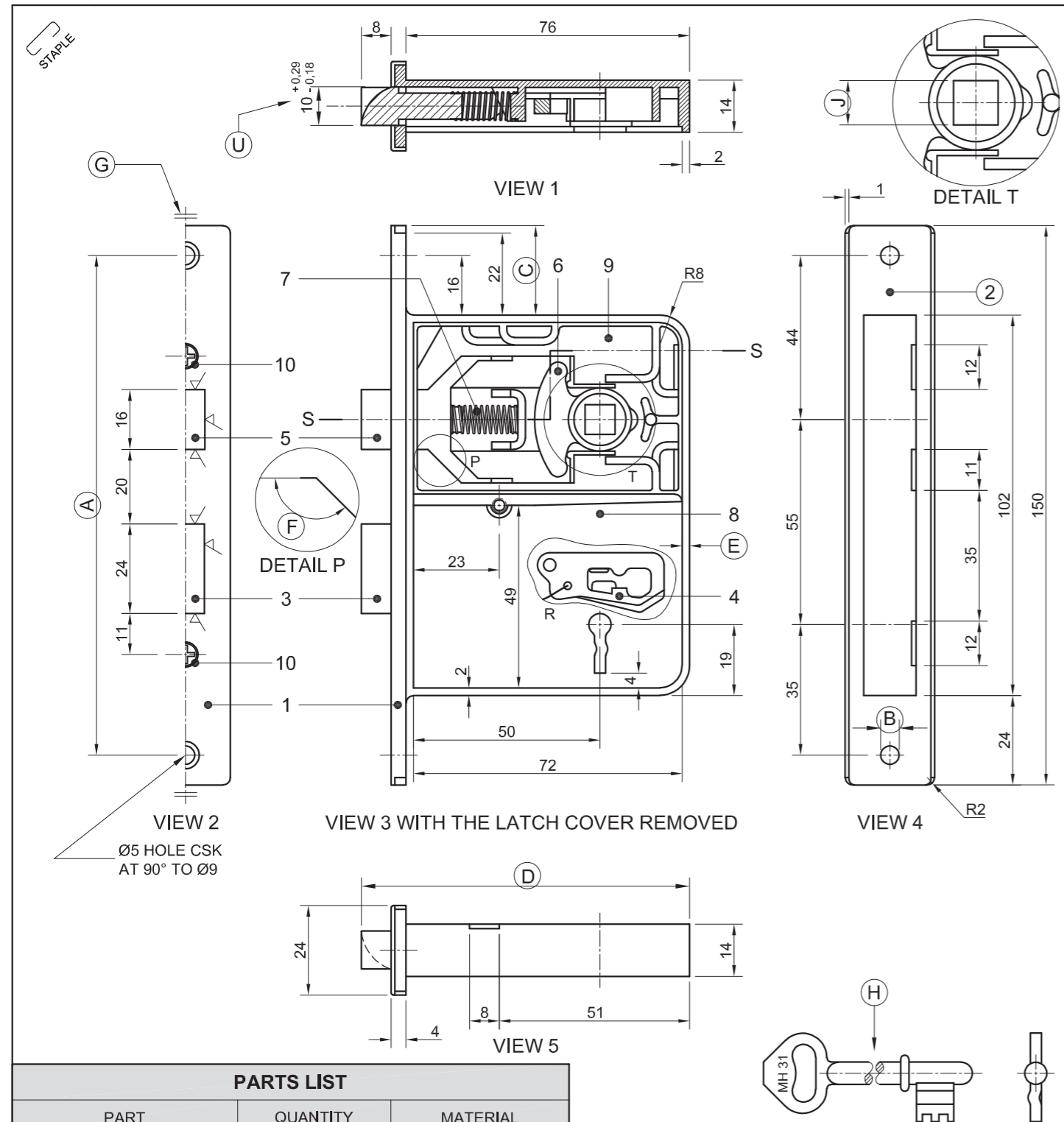
QUESTIONS		ANSWERS	
1	What is the title of the drawing?	1	
2	In which street is the engineering company situated?	1	
3	How many sets of drawings are there for this assembly?	1	
4	Who checked the drawing?	1	
5	What is the file name?	1	
6	If VIEW 1 is the front view, what is VIEW 2 called?	2	
7	Label the detailed enlargement of the encircled area at A on the given drawing.	1	
8	How many coil springs are there in the assembly?	1	
9	Determine the complete dimensions at: B: C: D: E:	4	
10	Measure the angle at F.	1	
11	If scale 1 : 2 was used, what would the dimension at G read?	1	
12	Name the type of finish at H.	1	
13	What does the abbreviation AF at J stand for?	1	
14	Name the type of section at K.	1	
15	Complete the cutting plane in VIEW 1 by inserting the arrows. Label the cutting plane P-P.	3	
16	Name the type of section produced by cutting plane P-P.	1	
17	With reference to the tolerance, determine the complete minimum dimension at L.	2	
18	In the space below (ANSWER 18), draw, in neat freehand, the SANS 10111 conventional representation of a BEARING.	3	
19	In the space to the left of VIEW 1, under ANSWER 19, draw and label, in proportion and in neat freehand, a removed section according to cutting plane S-S.	3	
<b>TOTAL</b>		<b>30</b>	

ANSWER 18:

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FILE NAME: VB JW031	DRAWING No: JOP12	DRAWING SET: 1 OF 3	VERY BEST JOCKEY WHEELS ENGINEERING (VB JW)		18 SPEED STREET CHAINVILLE 0110
DRAWING PROGRAM: AUTOCAD 2019		SCALE 1 : 1	www.bicycleparts.sa		CELL: 098 765 4321
DRAWN BY:	REINHARD	DATE: 02/03/2020			
CHECKED BY:	MAFIKA	DATE: 03/03/2020			
APPROVED BY:	TSUMI	DATE: 09/03/2020			
			TITLE REAR DERAILLEUR ASSEMBLY		





PARTS LIST		
PART	QUANTITY	MATERIAL
1	1	METAL
2	1	PLASTIC
3	1	PEWTER
4	2	METAL
5	1	PEWTER
6	1	PLASTIC
7	1	SPRING STEEL
8	1	PLASTIC
9	1	PERSPEX
10	3	METAL

DRAWING PROGRAM: CAD	SCALE 1 : 1	MANUFACTURING PROCESSES: - PLATE BENDING - INJECTION MOULDING - MILLING ✓
APPROVED: ANDY	DATE: 2018/09/14	
CHECKED: JOHN	DATE: 2018/08/31	
DRAWN: SIPO	DATE: 2018/08/30	DRAWING NR: DL 04
TOP LOCK COMPANY		SAFETY & SECURITY SHOP 2 MORTICE ROAD www.lockcompany.co.za
TITLE		
<b>TWO-LEVER DOOR LOCK</b>		

**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**  
Five views of a door lock, two detailed enlargements, two views of a key, a parts list, a title block and a table of questions. The drawing has not been prepared to the indicated scale.

**Instructions:**  
Complete the table below by neatly answering the questions which refer to the accompanying drawing, title block and mechanical content. [30]

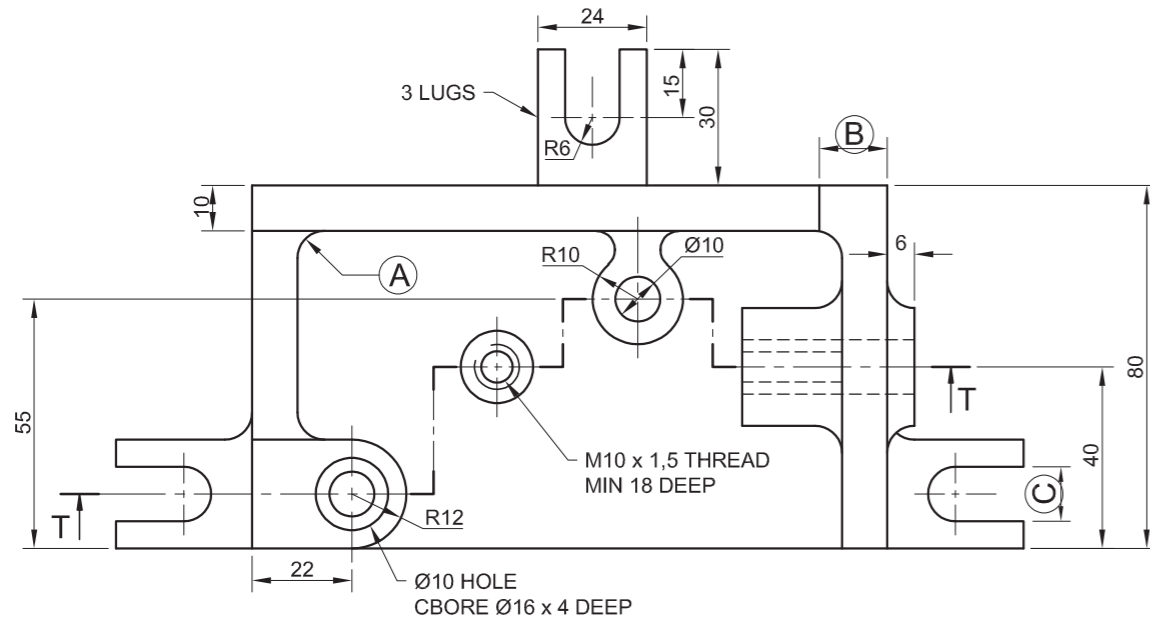
QUESTION		ANSWER		
1	What is the title of the drawing?	1		
2	Who prepared the drawing?	1		
3	On what date was the drawing approved?	1		
4	What is the drawing number?	1		
5	How many manufacturing processes are required?	1		
6	How many parts make up the door lock?	1		
7	What material is used to manufacture the latch cover?	1		
8	What is VIEW 5 called?	1		
9	Determine the complete dimensions at A:      B:      C:      D:      E:	5		
10	Measure the angle at F.	1		
11	Name the convention at G.	1		
12	What type of view is produced by the S-breaks at H?	1		
13	What type of section is produced by cutting plane S-S?	1		
14	Insert the arrows for cutting plane S-S on the drawing.	2		
15	If the square in DETAIL T is 9 x 9 mm, show the alternative method of showing the dimension of 9 x 9 at J.	1		
16	How many flat surfaces must be machined?	1		
17	Name the direction of lay that must be applied to machined surfaces.	1		
18	With reference to the tolerance, determine the maximum dimension at U.	2		
19	In the space below (ANSWER 19), draw, in neat freehand, the conventional representation of a coil spring.	3		
20	In the space below (ANSWER 20), draw, in neat freehand, the symbol for the projection system used.	3		
<b>TOTAL</b>		<b>30</b>		

ANSWER 19: Conventional representation for a coil spring

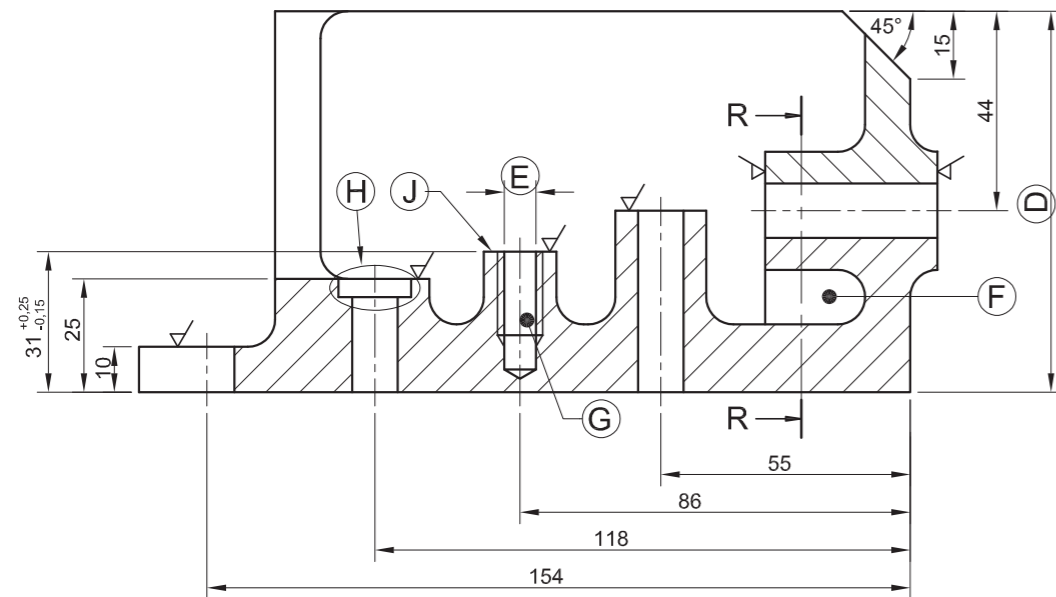
ANSWER 20: Projection symbol

EXAMINATION NUMBER

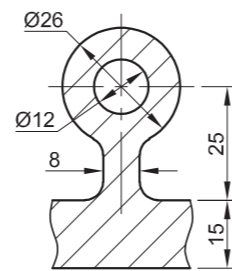
EXAMINATION NUMBER 2



VIEW 2



VIEW 1



VIEW R-R

**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Two views and a section of a mechanical jig, a title block and a table of questions. The drawing has not been prepared to the indicated scale.

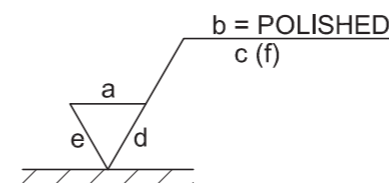
**Instructions:**

Complete the table below by neatly answering the questions which refer to the accompanying drawing, the title block and mechanical content. **[30]**

QUESTIONS		ANSWERS	
1	What was Ingrid's responsibility?	1	
2	What is the manufacturer's web site address?	1	
3	What is the file name?	1	
4	Who is the client?	1	
5	How many jigs must be manufactured?	1	
6	What is VIEW 1 called?	2	
7	What type of section is VIEW R-R?	1	
8	Name the type of section that will be produced by cutting plane T-T.	1	
9	Determine the complete dimensions at: A: B: C: D: E:	5	
10	Determine the total length of the jig.	1	
11	Name the feature at F.	1	
12	What is the minimum depth of the thread required for the hole at G?	1	
13	Name the feature at H.	1	
14	How many surfaces of the jig must be machined?	1	
15	Describe the hatching mistake on VIEW 1.	2	
16	With reference to the tolerance, determine the minimum height at J.	1	
17	With reference to the machining symbol below, match the letter on the symbol with the correct label in the column to the right of this question.	DIRECTION OF LAY	
		ROUGHNESS VALUE	
		SAMPLING LENGTH	
		MACHINING ALLOWANCE	
18	In the space below (ANSWER 18), draw, in neat freehand, the symbol for the projection system used.	4	
<b>TOTAL</b>		<b>30</b>	

QUESTION 17:

ANSWER 18:

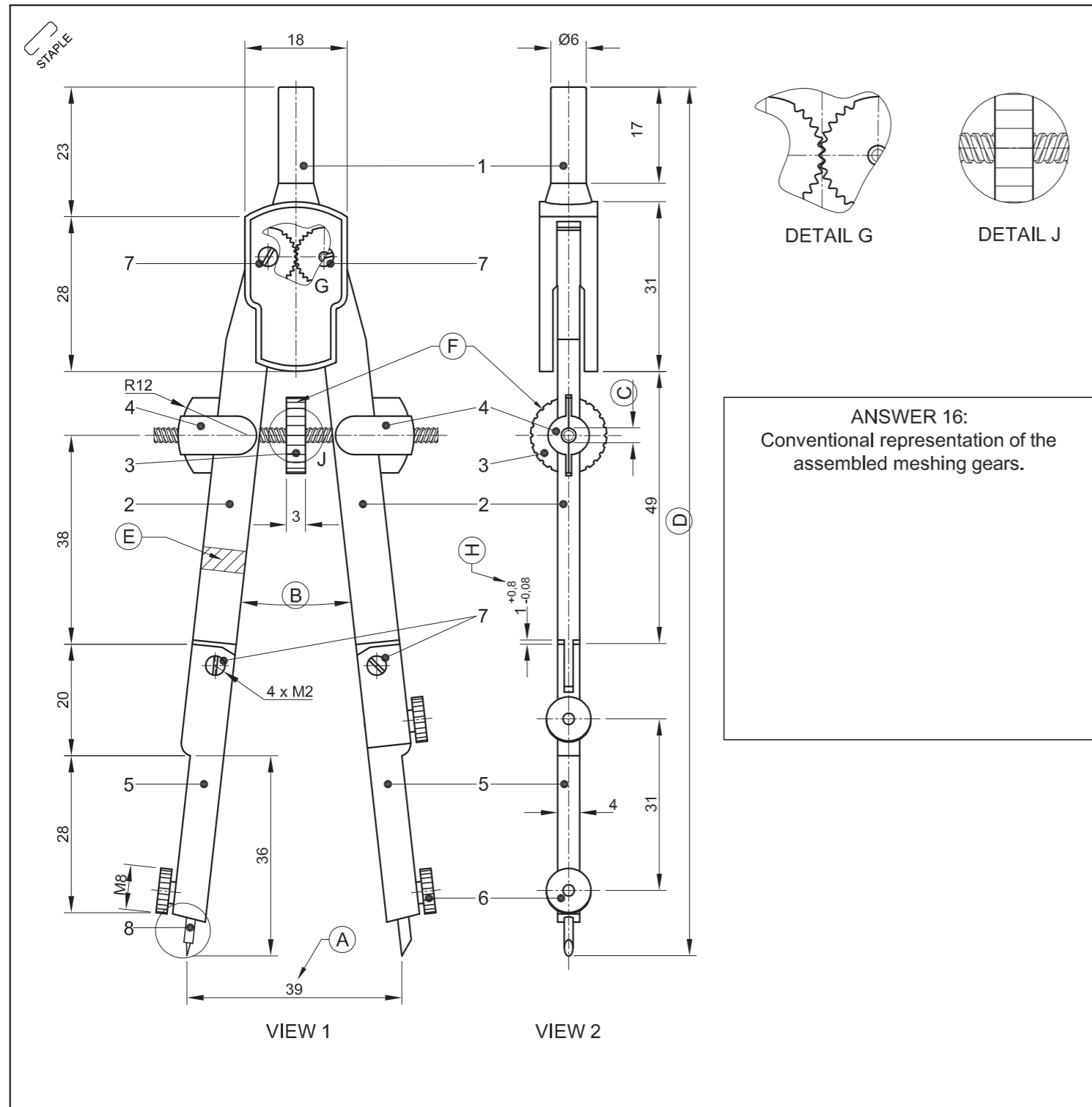


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FILE NAME: MJIG-12-V5	MATERIAL: CAST IRON	QUANTITY: 30 UNITS	FINISH:  POLISHED
DRAWING No. 3	SCALE 1 : 2	ALL DIMENSIONS ARE IN MILLIMETRES	
COMMISSIONED BY: JR MANUFACTURES 105 FIRST AVENUE, BRITS	DRAWING PROGRAMME:	ALL UNSPECIFIED RADII ARE 4 mm	
<b>CASTFORM</b> ENGINEERING	98 BROAD STREET MIDDELFRONTEIN 4070 www.foundry.co.za 003 645 7820	DRAWN BY: SIPHO	DATE: 2018-11-13
		CHECKED BY: INGRID	DATE: 2018-12-14
		APPROVED BY: NDIRI	DATE: 2019-01-21
TITLE	<b>MECHANICAL JIG</b>		

EXAMINATION NUMBER	
EXAMINATION NUMBER	<b>2</b>





**QUESTION 1: ANALYTICAL (MECHANICAL)**

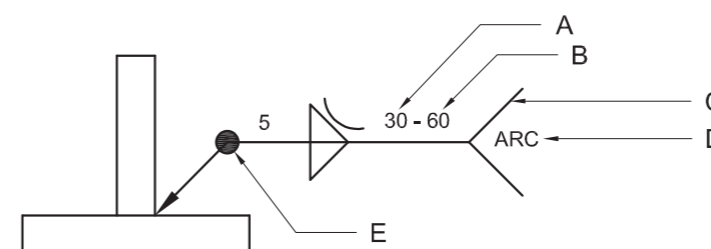
**Given:**  
The front view and the right view of a compass, two detailed enlargements, a parts list, a title block, a welding symbol and a table of questions. The drawing has not been prepared to the indicated scale.

**Instructions:**  
Complete the table below by neatly answering the questions which refer to the accompanying drawing, the title block and mechanical content. [30]

QUESTIONS		ANSWERS	
1	What is the title of the drawing?	1	
2	Who prepared the drawing?	1	
3	What material is used to manufacture the needle point?	1	
4	How many parts make up the compass assembly?	1	
5	What is VIEW 2 called?	1	
6	What would be an advantage of a compass with an adjustment shaft and wheel?	1	
7	What is the purpose of part 4?	1	
8	With reference to the dimension at A, what will the diameter of the circle be at the current setting?	1	
9	Measure the angle at B.	1	
10	Determine the complete dimensions at: C: D:	2	
11	Name the type of section at E.	1	
12	Name the finish on the adjustment wheel at F.	1	
13	What is the purpose of the finish on the adjustment wheel at F?	1	
14	With reference to the tolerance, determine the minimum dimension at H?	1	
15	With reference to the welding symbol below, match the letter on the welding symbol with the label in the column to the right of this question.	FIELD/SITE WELD	
		TAIL	
		WELD LENGTH	5
		WELD PITCH	
16	With reference to DETAIL G, draw, in neat freehand and in the space provided on the drawing sheet (ANSWER 16), the SANS 10111 conventional representation of the assembled meshing gears.	6	
17	In the space below (ANSWER 17), draw, in neat freehand, the symbol for the projection system used.	4	
<b>TOTAL</b>		<b>30</b>	

PARTS LIST			APPROVED: SAMUEL	DATE: 2018-06-07	
PART	QUANTITY	MATERIAL	CHECKED: JONAS	DATE: 2018-05-01	
1	GRIP	1	PLASTIC	DRAWN: WESSLY	
2	LEGS	2	PEWTER	DATE: 2018-03-30	
3	M3 ADJUSTMENT SHAFT AND WHEEL	1	STEEL + PLASTIC	DRAWING PROGRAM: AUTOCAD 2018	
4	QUICK RELEASE	2	PLASTIC	SCALE 1 : 1	
5	EXTENSION	2	PEWTER	<b>BEST STATIONERY</b> 123 Pencil Road Johannesburg www.beststationery.com	
6	STUD + LOCK WHEEL	3	STEEL + PLASTIC		
7	M2 LOCK SCREW	4	TOOL STEEL		
8	NEEDLE POINT	1	TOOL STEEL		
			TITLE		<b>COMPASS</b>

QUESTION 15: Welding symbol



ANSWER 17: Projection symbol

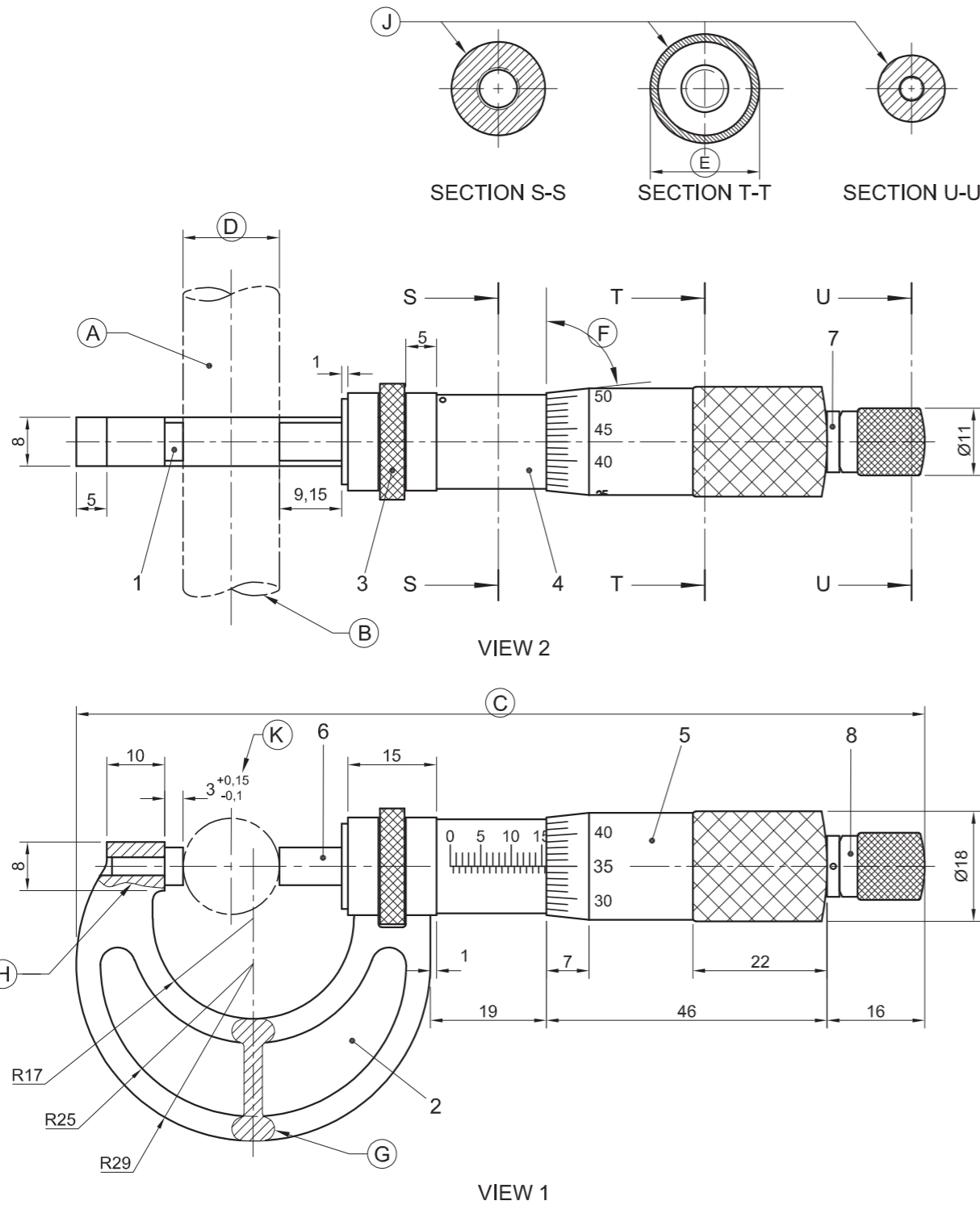
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EXAMINATION NUMBER

EXAMINATION NUMBER

2





**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

The front view and top view of a micrometer, sections, a parts list, a title block and a table of questions. The drawing has not been prepared to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions which refer to the accompanying drawing, title block and mechanical content. **[30]**

QUESTIONS		ANSWERS	
1	Who prepared the drawing?	1	
2	On what date was the drawing checked?	1	
3	What was Siyabongi's responsibility?	1	
4	What is the drawing number?	1	
5	What material is used to manufacture the anvil?	1	
6	How many parts make up this micrometer?	1	
7	At what temperature will the micrometer be accurate?	1	
8	What is the maximum size that this micrometer can measure?	1	
9	Why is the shaft at A drawn as a phantom line (double chain line)?	1	
10	What does the S-break at B indicate?	1	
11	Give TWO uses of chain lines on mechanical drawings.	2	
12	How many surfaces on this micrometer are knurled?	1	
13	What is VIEW 1 called?	1	
14	Determine the complete dimensions at: C: D: E:	5	
15	Measure the angle at F.	1	
16	Name the type of section at G.	1	
17	Name the type of section at H.	1	
18	Name the type of section at J.	2	
19	With reference to the tolerance at K, determine the minimum dimension.	2	
20	In the space below (ANSWER 20), draw, in neat freehand, the symbol for the projection system used.	4	
<b>TOTAL</b>		<b>30</b>	

PARTS LIST		
PART	QUANTITY	MATERIAL
1	1	TUNGSTEN
2	1	CAST IRON
3	1	TOOL STEEL
4	1	TOOL STEEL
5	1	TOOL STEEL
6	1	SILVER STEEL
7	1	TOOL STEEL
8	1	TOOL STEEL

DRAWING PROGRAM: AUTOCAD 2018      SCALE 1 : 1

DIMENSIONS ARE ACCURATE AT 20 °C      DRAWING NUMBER MC 25-V2018

ACCURACY: 1 TURN OF THE OUTER SLEEVE = 0,5 mm

MEASUREMENT RANGE: MINIMUM = 0,01 & MAXIMUM = 25,00

APPROVED: SIYABONGI      DATE: 2018-02-28

CHECKED: JACQUES      DATE: 2018-02-10

DRAWN: WENDY      DATE: 2018-01-08

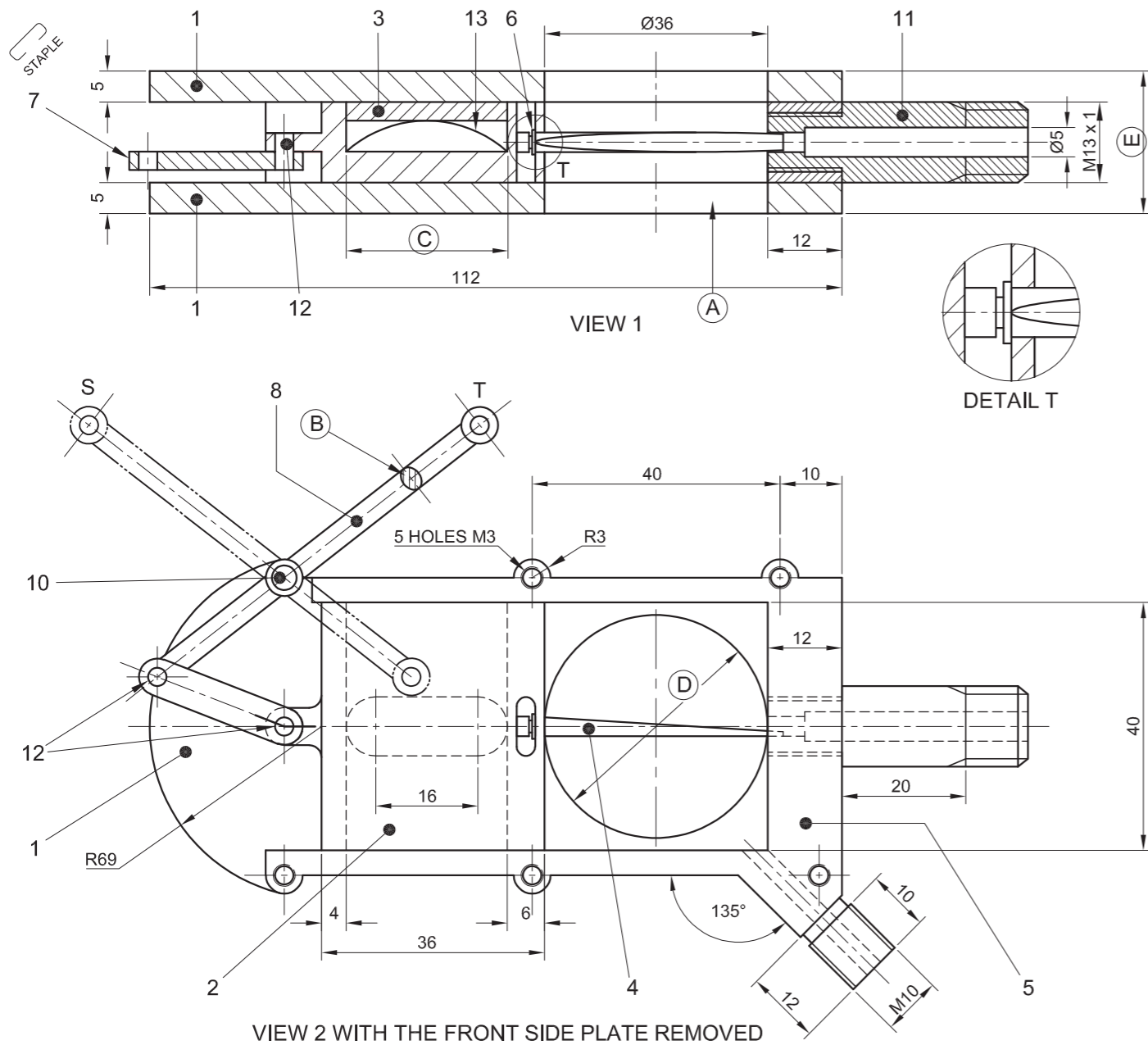
**TITLE      MICROMETER**

ANSWER 20: Projection symbol



EXAMINATION NUMBER	
EXAMINATION NUMBER	2





**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Two views and a detailed enlargement of a throttle assembly, a parts list, a title block and a table of questions. The drawing has not been prepared to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions, which refer to the accompanying drawing and the title block. **[30]**

QUESTIONS		ANSWERS	
1	What is the manufacturer's street address?	1	
2	What is the file name of the drawing?	1	
3	Who checked the drawing?	1	
4	Which draughting method was used to prepare the drawing?	1	
5	What is the radius of all unspecified curves?	1	
6	What material is used to manufacture the throttle needle?	1	
7	How many parts make up the assembly?	1	
8	What is the shape of the unhatched area at A?	1	
9	Name the type of section at B.	1	
10	Give the complete title of VIEW 1?	1	
11	How many screw threads are shown in VIEW 2?	1	
12	The extreme positions of the lever (part 8) are S and T. Using the correct line type, according to the <i>SANS 10111</i> , draw the movement of the lever between S and T.	2	
13	Determine the complete dimensions at C: D: E:	3	
14	Why is part 12 in VIEW 1 not hatched?	1	
15	Name ALL the parts shown in DETAIL T.	3	
16	With reference to the machining symbol below, match the letter on the symbol with the correct element in the column to the right of this question.	DIRECTION OF LAY	1
		MACHINING ALLOWANCE	1
		PRODUCTION METHOD	1
		ROUGHNESS VALUE	1
17	Insert the cutting plane on VIEW 2 and label it A-A.	3	
18	In the space below (ANSWER 18), draw, in neat freehand, the symbol for the projection system used.	3	
<b>TOTAL</b>		<b>30</b>	

PARTS LIST			
PART	QUANTITY	MATERIAL	
1	2	STAINLESS STEEL	
2	1	BRASS	
3	1	BRASS	
4	1	BRASS	
5	1	STAINLESS STEEL	
6	1	SPRING STEEL	
7	1	MILD STEEL	
8	1	MILD STEEL	
9	10	MILD STEEL	
10	1	MILD STEEL	
11	1	BRASS	
12	2	MILD STEEL	
13	1	SPRINGSTEEL	

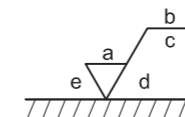
APPROVED: ALEX	DATE: 2018-05-17
CHECKED: ROLI	DATE: 2018-05-12
DRAWN: NICOLENE	DATE: 2018-04-29
DRAWING PROGRAM: AUTOCAD 2018	FILE NAME: BR2018
ALL UNSPECIFIED RADII ARE R2.	SCALE 1 : 1

**AERO MAN**

1 VISCOUNT STREET  
HOPEFIELD  
4561  
www.aeroman.co.za  
☎ 023-555 6699

TITLE  
**THROTTLE ASSEMBLY**

**QUESTION 16: MACHINING SYMBOL**



**ANSWER 18: PROJECTION SYMBOL**

\_\_\_\_\_

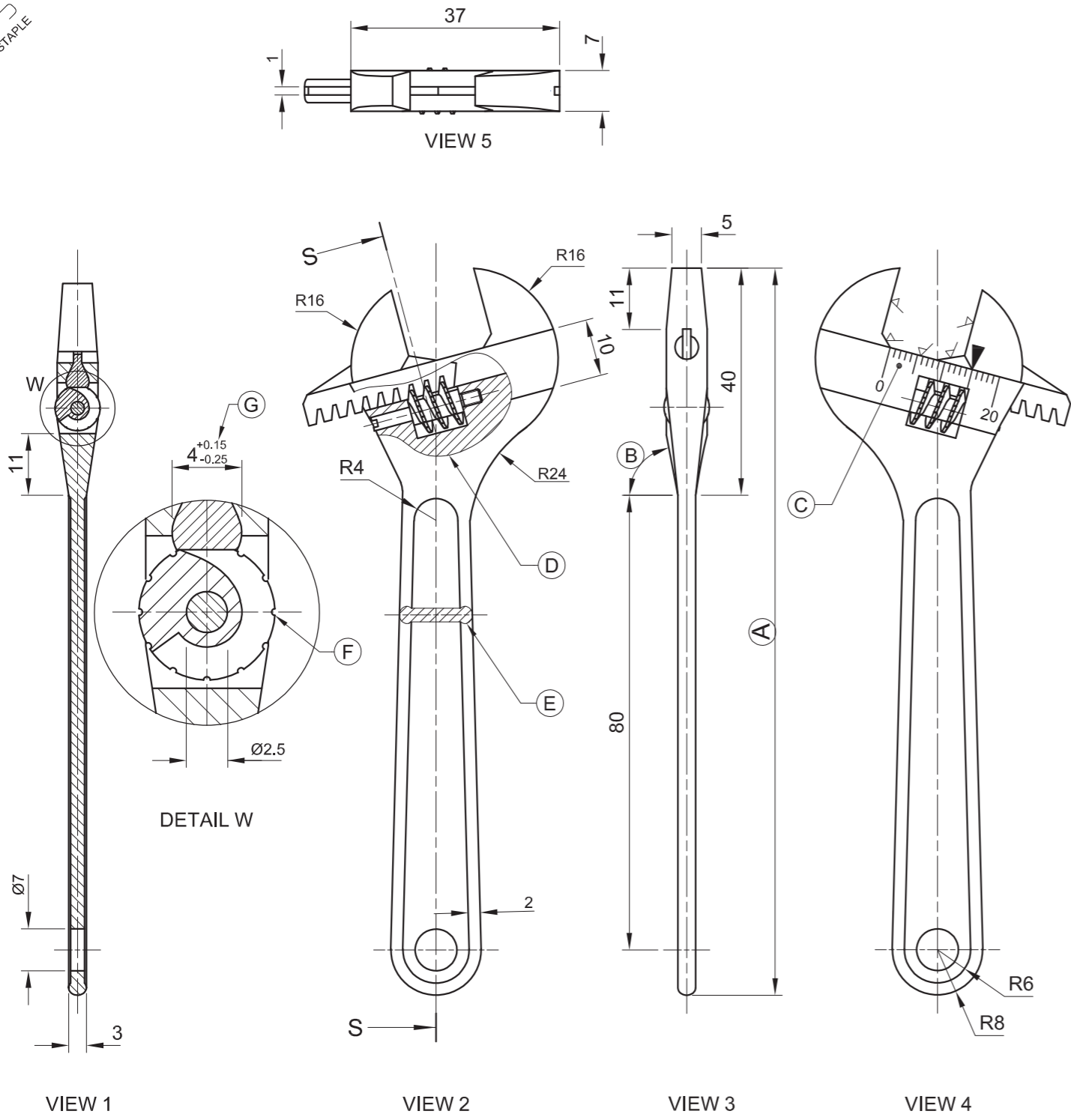
EXAMINATION NUMBER

EXAMINATION NUMBER

2



STAPLE



**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**  
Five views and a detailed enlargement of a shifting spanner assembly, a parts list, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

**Instructions:**  
Complete the table below by neatly answering the questions which all refer to the accompanying drawing and the title block. [28]

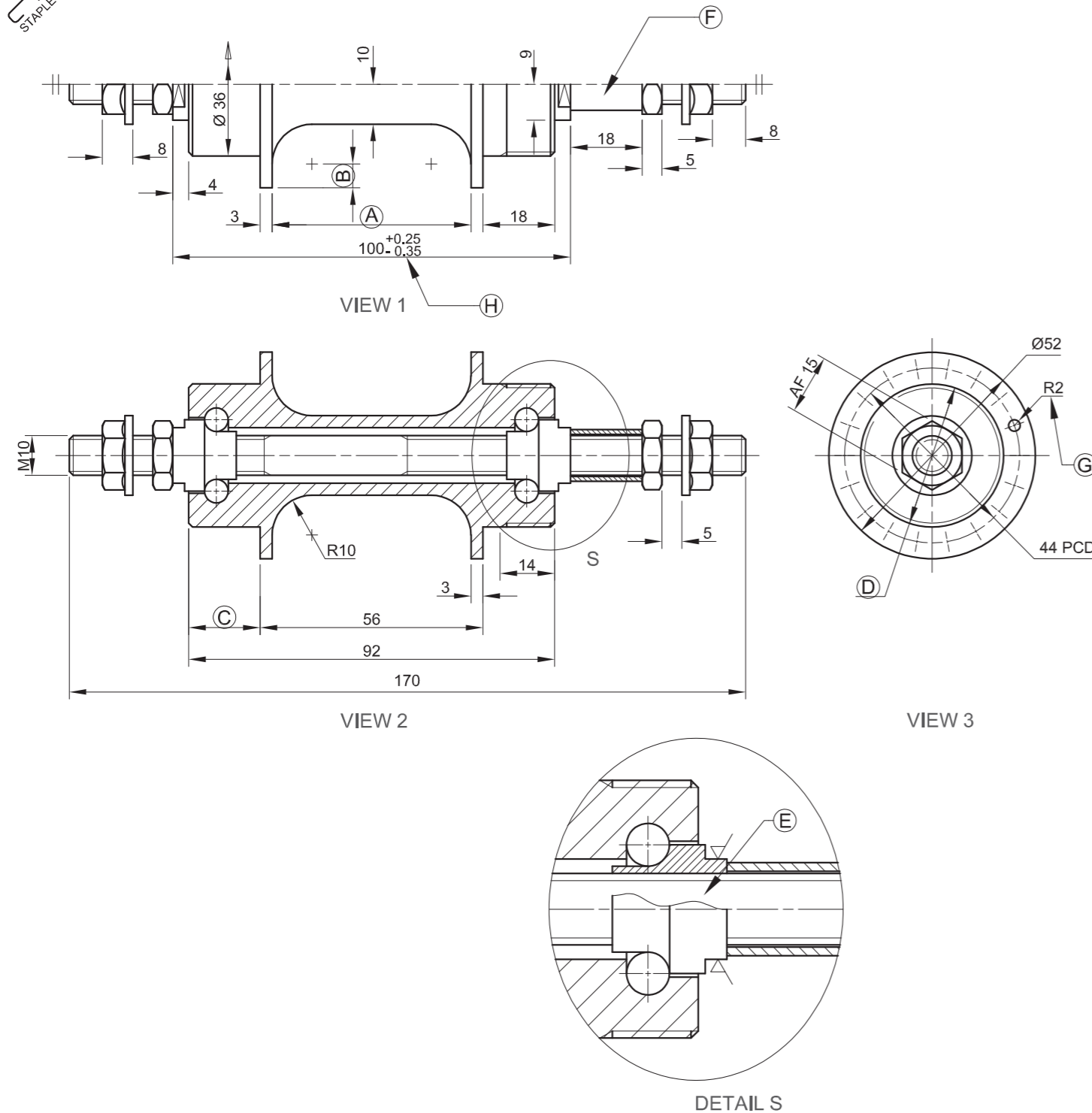
QUESTIONS		ANSWERS	
1	What is the title of the drawing?	1	
2	What scale is indicated for the drawing?	1	
3	What drawing program was used?	1	
4	On what date was the drawing drawn?	1	
5	Who approved the drawing?	1	
6	What is the radius of the unspecified curves?	1	
7	What material is used to manufacture the adjustable jaw?	1	
8	What type of heat treatment is required for the jaws?	1	
9	Which projection system has been used for the drawing?	1	
10	Determine the dimension at A.	1	
11	Measure the angle at B.	1	
12	What is the purpose of the measurements on the fixed jaw and handle at C?	2	
13	Name the type of section at D.	1	
14	Name the type of section at E.	1	
15	What is purpose of the grooves at F?	1	
16	If view 2 is the front view, what would view 4 be called?	1	
17	What is the purpose of the enlarged detailed view?	1	
18	What type of section resulted from cutting plane S-S?	1	
19	With reference to the tolerance, determine the minimum dimension at G.	2	
20	How many surfaces of the fixed jaw and handle must be machined?	1	
21	What direction of lay must be applied to the machined surfaces?	1	
22	In the space below (ANSWER 22), draw, in neat freehand, the conventional representation of a bearing on a section of a shaft.	5	
<b>TOTAL</b>		<b>28</b>	

PARTS LIST				DRAWING PROGRAM: AUTOCAD 2017		SCALE 1 : 1
PART	QUANTITY	MATERIAL	ALL UNSPECIFIED RADII ARE R2.			
1	FIXED JAW AND HANDLE	1	CHROME VANADIUM CASTING	APPROVED: STEYN	DATE: 2017-02-28	
2	ADJUSTABLE JAW	1	TOOL STEEL	CHECKED: JOHN	DATE: 2017-02-10	
3	WORM SCREW	1	EN 19	DRAWN: WERNER	DATE: 2017-01-08	
4	WORM SHAFT	1	TOOL STEEL	<b>TITLE</b> <b>SHIFTING SPANNER</b>		
HEAT TREATMENT ON ALL JAWS		HARDENING				
METHOD OF MACHINING		MILLING				

ANSWER 22: Conventional representation of a bearing on a section of a shaft

EXAMINATION NUMBER	
EXAMINATION NUMBER	2





**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Three views of a rear wheel hub assembly, a detailed enlargement, a parts list, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions, which refer to the accompanying drawings and the title block. [30]

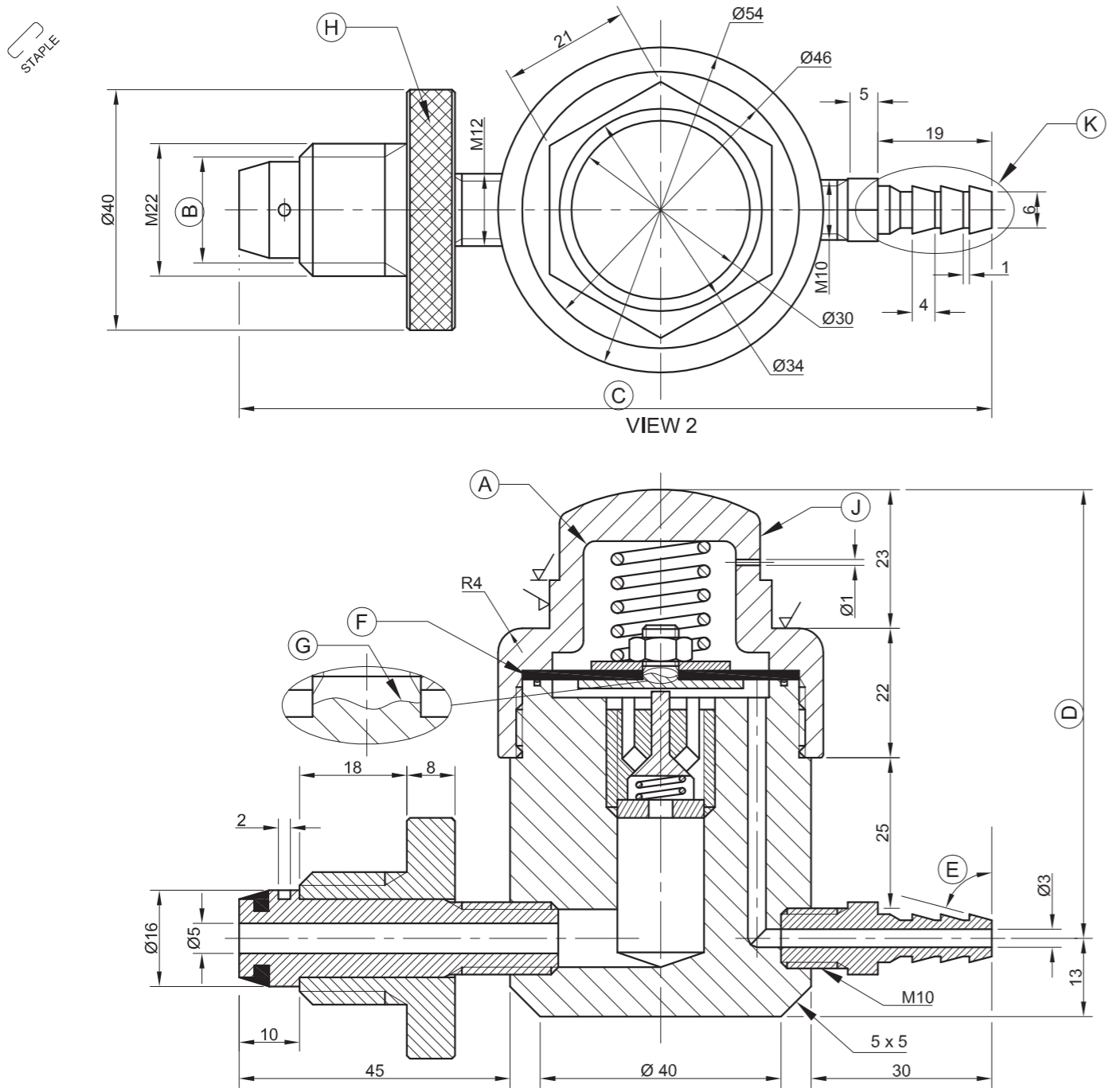
QUESTIONS		ANSWERS	
1	What is the title of the drawing?	1	
2	Which drawing program was used?	1	
3	What scale is indicated for the drawing?	1	
4	Who checked the drawing?	1	
5	What is the file name?	1	
6	What type of final finish is required?	1	
7	What material is used to manufacture the bearing nut?	1	
8	How many parts are there in the assembly?	1	
9	What is VIEW 3 called?	1	
10	Determine the complete dimensions at A: B: C: D:	4	
11	What does the abbreviation PCD stand for?	1	
12	What does the abbreviation AF stand for?	1	
13	Which convention is applied to VIEW 1?	1	
14	Name the type of section on the bearing nut at E.	1	
15	Refer to the parts list and identify the part at F.	1	
16	What type of machining is required?	1	
17	How many surfaces must be machined?	2	
18	How many R2 holes, as indicated at G, are there in the rear wheel hub?	1	
19	With reference to the tolerance, determine the minimum dimension at H.	2	
20	Insert the cutting plane on VIEW 3 and label it A-A.	3	
21	In the space below (ANSWER 21), draw, in neat freehand, ONE view that will indicate the convention for a square on a shaft or a flat face on a cylinder.	3	
<b>TOTAL</b>		<b>30</b>	

PARTS LIST			APPROVED: SASHA	DATE: 13-11-2016	
PART	QUANTITY	MATERIAL	CHECKED: JOHN	DATE: 11-11-2016	
1	M10 SHAFT	1	MILD STEEL	DRAWN: WERNER	DATE: 16-10-2016
2	BALL BEARINGS	16	STAINLESS STEEL	DRAWING PROGRAM: AUTOCAD	FILE NAME: BF 71116
3	BEARING NUT	2	EN 19	HEAT TREATMENT: HARDENING	SCALE 2 : 3
4	M10 NUT	2	TOOL STEEL	FINAL FINISH: CHROME PLATING	✓ MILLING
5	M10 LOCKNUT	2	TOOL STEEL	GP BICYCLES SPARES AND ACCESSORIES 179 MILTON ST Faraday Park www.uniquebikes.co.za ☎ 016 123 4567	
6	SPACER	1	MILD STEEL		
7	WHEEL HUB	1	MILD STEEL		

**ANSWER 21 - Convention for a square or a flat face**

TITLE	EXAMINATION NUMBER
<b>REAR WHEEL HUB</b>	EXAMINATION NUMBER <span style="float: right;">2</span>





PARTS LIST		
PART	QUANTITY	MATERIAL
1	1	BRASS
2	1	BRASS
3	1	RUBBER
4	1	BRASS
5	1	BRASS
6	1	SPRING STEEL
7	1	STAINLESS STEEL
8	1	RUBBER
9	1	SPRING STEEL
10	1	BRASS
11	1	BRASS

APPROVED: SOON      DATE: 2015-12-06

CHECKED: VERNON      DATE: 2015-11-10

DRAWN: WIKUS      DATE: 2015-10-31

DRAWING PROGRAMME: AUTOCAD 2016

ALL UNSPECIFIED RADII ARE R2.      SCALE 1 : 1

METHOD OF MACHINING: MILLING

**THE ONE GAS COMPANY**      75 AIR STREET  
www.theonegas.co.za      012 357 8910

TITLE  
**GAS REGULATOR**

**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**  
An assembly drawing showing two views of a gas regulator assembly, a parts list, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

**Instructions:**  
Complete the table below by neatly answering the questions, which refer to the accompanying drawing and the title block. [30]

QUESTIONS		ANSWERS	
1	What is the title of the drawing?	1	
2	What is the web address of the company?	1	
3	What method of machining is prescribed?	1	
4	Which drawing program was used to prepare the drawing?	1	
5	On what date was the drawing drawn?	1	
6	Who approved the drawing?	1	
7	What material is used to manufacture the seal?	1	
8	What is VIEW 1 called?	1	
9	Name the feature at A.	1	
10	Determine the complete dimensions at B: C: D:	3	
11	Measure the angle at E.	1	
12	Why is the part at F filled in solid?	1	
13	What is indicated by the feature at G?	1	
14	Name the type of finish at H.	1	
15	Refer to the parts list and identify the part at J.	1	
16	How many surfaces of the gas regulator assembly must be machined?	1	
17	Why is the feature at K tapered to one side only?	2	
18	Insert the cutting plane on VIEW 2 and label it S-S.	3	
19	In the space below (ANSWER 19), draw, in neat freehand, the convention for a coil spring.	3	
20	In the space below (ANSWER 20), draw, in neat freehand, the symbol for the projection system used.	4	
<b>TOTAL</b>		<b>30</b>	

ANSWER 19:  
Convention for a coil spring

ANSWER 20:  
Projection symbol

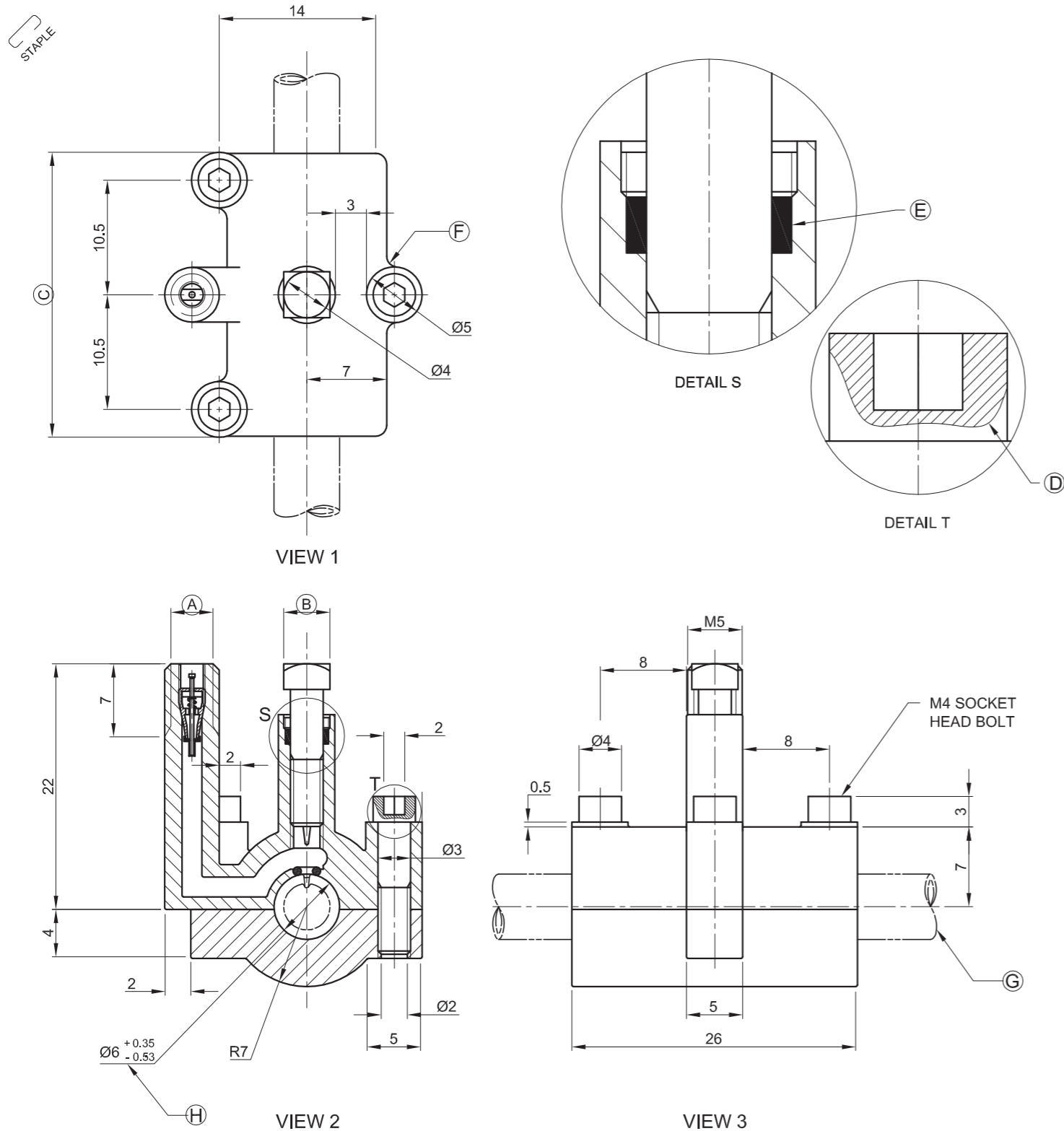
EXAMINATION NUMBER

EXAMINATION NUMBER **2**









**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Three views and two detailed enlargements of a tapping valve assembly, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

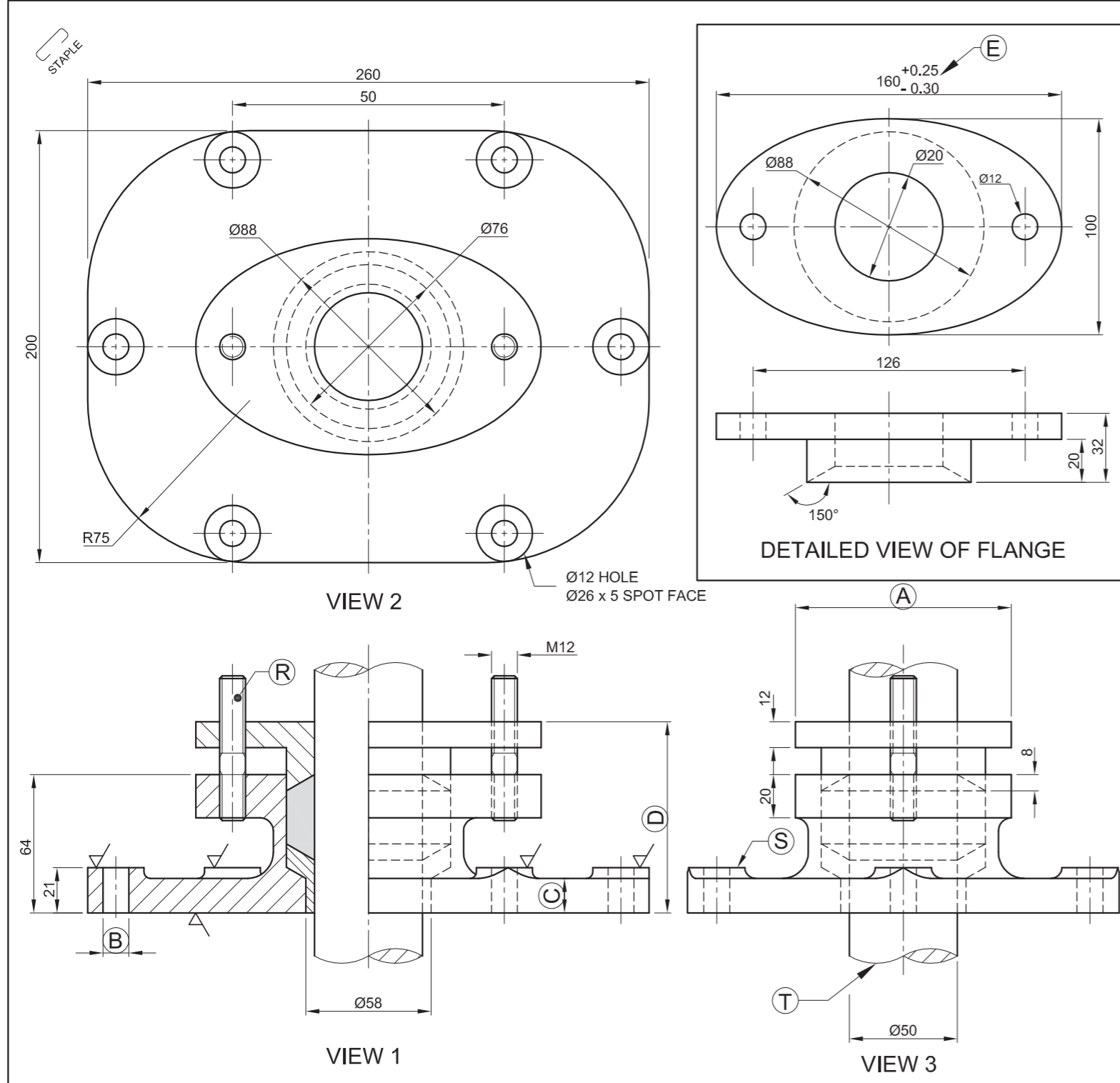
**Instructions:**

Complete the table below by neatly answering the questions, which all refer to the accompanying drawings and the title block. [30]

QUESTIONS		ANSWERS	
1	What is the title of the assembly?	1	
2	On what date was the drawing drawn?	1	
3	What is the drawing number?	1	
4	What scale is indicated for the drawing?	1	
5	Which drawing program was used?	1	
6	Who approved the drawing?	1	
7	What material is used to manufacture the main base?	1	
8	What would VIEW 2 be called?	1	
9	How many socket head bolts are there in the assembly?	1	
10	Give the complete dimensions at: A : B : C :	3	
11	Name the feature at F.	1	
12	Name the type of section at D.	1	
13	Why is the component at E filled in solid?	1	
14	What is the total height of the assembly?	1	
15	What is the purpose of the two enlarged detailed views?	2	
16	What is indicated by the convention at G?	1	
17	With reference to the tolerance, determine the maximum dimension at H?	2	
18	With reference to the tolerance, determine the minimum dimension at H?	2	
19	Insert the cutting plane on VIEW 3 and label it A-A.	3	
20	In the space provided below, draw, in neat freehand, the symbol for the projection system used.	4	
<b>TOTAL</b>		<b>30</b>	

PARTS LIST				FILE NAME: RCO/VK 0002.dwg	TITLE		ANSWER 20
PART	QUANTITY	MATERIAL		DRAWING No. 2015 - A - 005	TAPPING VALVE		
1	1	REF: DETAILED DRAWING	ALL DIMENSIONS ARE IN MILLIMETRES.	APPROVED: ANDREW BRAND	2015/01/23		
2	3	TOOL STEEL	DRAWING PROGRAM: AUTOCAD 2015	CHECKED: SOON DENTON	2015/01/16		
3	1	TOOL STEEL	MATERIALS: STEEL, PEWTER AND RUBBER	DRAWN: CHRISTI GREEF	2015/01/05		
4	1	PEWTER	<b>ReCO REFRIGERATION</b> 15 EDISON BLVD INDUSTRIAL PARK 1911	TAP VALVE TO BE USED FOR TAPPING OF 134a, R11, R22 AND 501 REFRIGERANTS IN COPPER PIPE ONLY			SYMBOL
5	1	PEWTER					EXAMINATION NUMBER
6	1	RUBBER					
7	1	RUBBER					EXAMINATION NUMBER
					SCALE 2 : 1		<b>2</b>





**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

A front view, top view and right view of a box and gland assembly, detailed drawing of the flange, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions, which all refer to the accompanying drawings and the title block. **[30]**

QUESTIONS		ANSWERS	
1	On what date was the drawing approved?	1	
2	What is the title of the assembly?	1	
3	What scale is indicated for the drawing?	1	
4	What material is used to manufacture the bush?	1	
5	On what date was the revision done?	1	
6	What is the drawing number?	1	
7	What would VIEW 3 be called?	1	
8	What type of section is shown in VIEW 1?	1	
9	What part is used to protect the flange surface when the nut is being tightened?	1	
10	Name the part at R.	1	
11	Name the feature at S.	1	
12	Name the feature at T.	1	
13	How many surfaces need to be machined?	1	
14	Give the complete dimensions at: A B	2	
15	Determine the complete dimensions at: C D	4	
16	With reference to the tolerance, determine the maximum dimension at E.	2	
17	With reference to the tolerance, determine the minimum dimension at E.	2	
18	Insert the cutting plane on VIEW 3 and label it A-A.	3	
19	In the space provided below, draw, in neat freehand, the symbol for the projection system used.	4	
<b>TOTAL</b>		<b>30</b>	

ALL DIMENSIONS ARE IN MILLIMETRES	SCALE: 1 : 2
DRAWING PROGRAM: AUTOCAD 2013	FINISH: POLISHED
FILE NAME: ANAS15.dwg	QUANTITY: 325 UNITS
DRAWING No. BG-15/4	MACHINING: MILLING
UNLESS OTHERWISE SPECIFIED, ALL TOLERANCES ON DIMENSIONS ARE ± 0,15. ALL UNSPECIFIED RADII ARE R3.	
<b>PEWIJO</b> ENGINEERING	15 FABRICIA ROAD KLISSERVILLE KIMBERLEY 8301 051 6273 849
	<b>TITLE</b> <b>BOX AND GLAND</b>

REVISIONS	DATE
1. INSERT SPOT FACE	2014/02/03
DRAWN: ALFA	2014/01/01
CHECKED: BRAVO	2014/02/02
APPROVED: ZERO	2014/03/03

PARTS LIST		
PART	MATERIAL	QUANTITY
1 BASE	CAST IRON	1
2 FLANGE	MILD STEEL	1
3 STUD	MILD STEEL	2
4 SHAFT	HARDENED STEEL	1
5 BUSH	RUBBER	1
6 WASHER	MILD STEEL	2
7 NUT	MILD STEEL	2

ANSWER 19

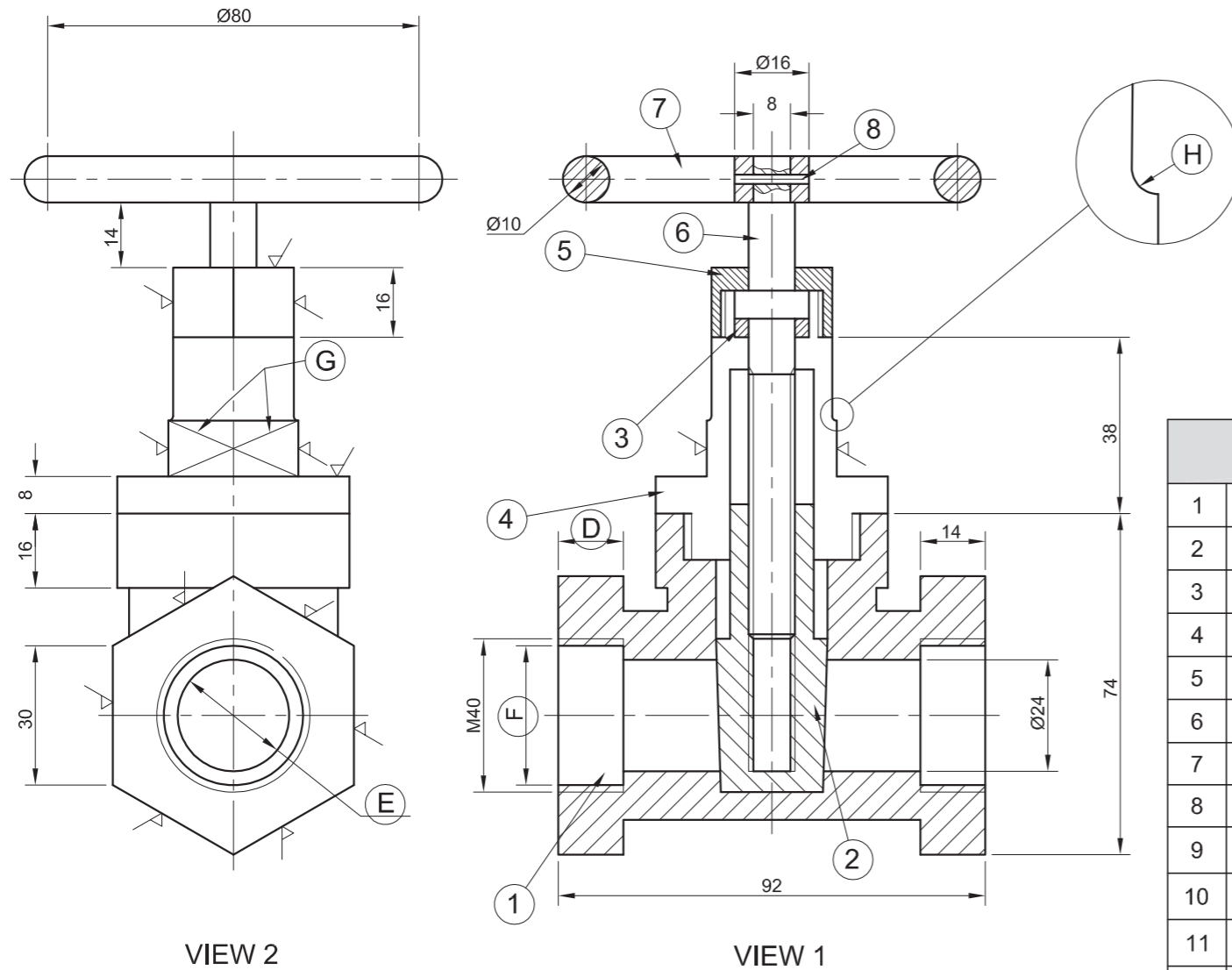
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SYMBOL

EXAMINATION NUMBER
EXAMINATION NUMBER







**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

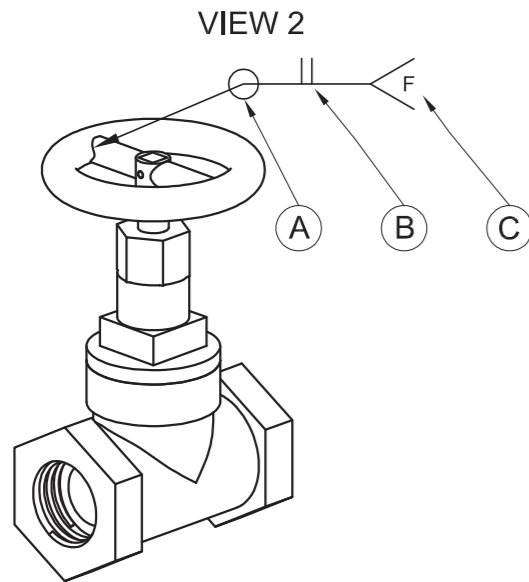
A front and the left view of a brass tap assembly in third-angle orthographic projection, an isometric drawing of the brass tap, a parts list, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions, which all refer to the accompanying drawings and the title block. **[29]**

QUESTIONS		ANSWERS	
1	On what date was the drawing prepared?	1	
2	In which city is the manufacturing company situated?	1	
3	From what material is the seal (part 3) made ?	1	
4	Who made the revision?	1	
5	What is the file name of the drawing?	1	
6	What scale is indicated for the drawing?	1	
7	What would VIEW 1 be called?	1	
8	Name the feature at H.	1	
9	What is indicated by feature G?	1	
10	What is the total height of the brass tap?	1	
11	How many parts make up the brass tap?	1	
12	Determine the complete dimensions at: D. E. F.	3	
13	With reference to the welding symbol, name the following elements.	A	1
		B	1
		C	1
14	What is the purpose of the pin (part 8)?	1	
15	How many surfaces must be machined?	1	
16	Add, in neat freehand, suitable hatching to the shaft guide (part 4) on view 1.	3	
17	Insert the cutting plane on <b>VIEW 2</b> and label it S-S.	3	
18	In the box below (answer 18), neatly draw, in freehand, the symbol for the projection system used.	4	
<b>TOTAL</b>		<b>29</b>	

PARTS LIST			
	PART	QUANTITY	MATERIAL
1.	TAP BODY	1	BRASS
2.	WEDGE	1	BRASS
3.	SEAL	1	RUBBER
4.	SHAFT GUIDE	1	BRASS
5.	GUIDE NUT	1	BRASS
6.	SHAFT	1	STAINLESS STEEL
7.	HAND WHEEL	1	STEEL
8.	PIN	1	STEEL



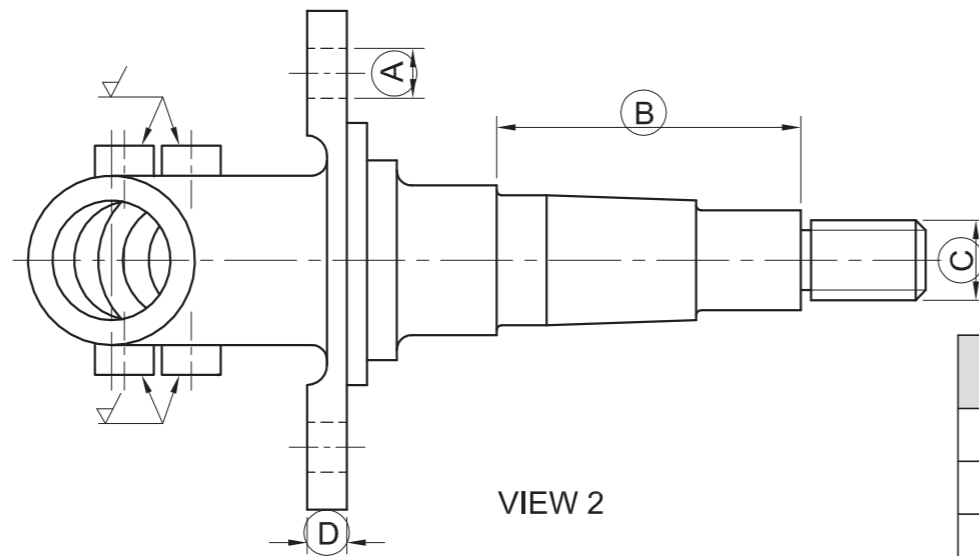
2013-09-26	AFROX	WELDING DETAIL	1
DATE	REVISED BY	REVISION DESCRIPTION	№

GRINDING 0,02	DRAWING PROGRAMME: AUTOCAD
DRAWING No. 01-225-BT	FILE NAME: ME31.dwg
APPROVED BY : J CLAASEN	DATE: 2013-09-20
CHECKED BY: L VAN ZYL	DATE: 2013-09-19
DRAWN BY: H SHADER	DATE: 2013-09-02
SCALE: 1 : 1	

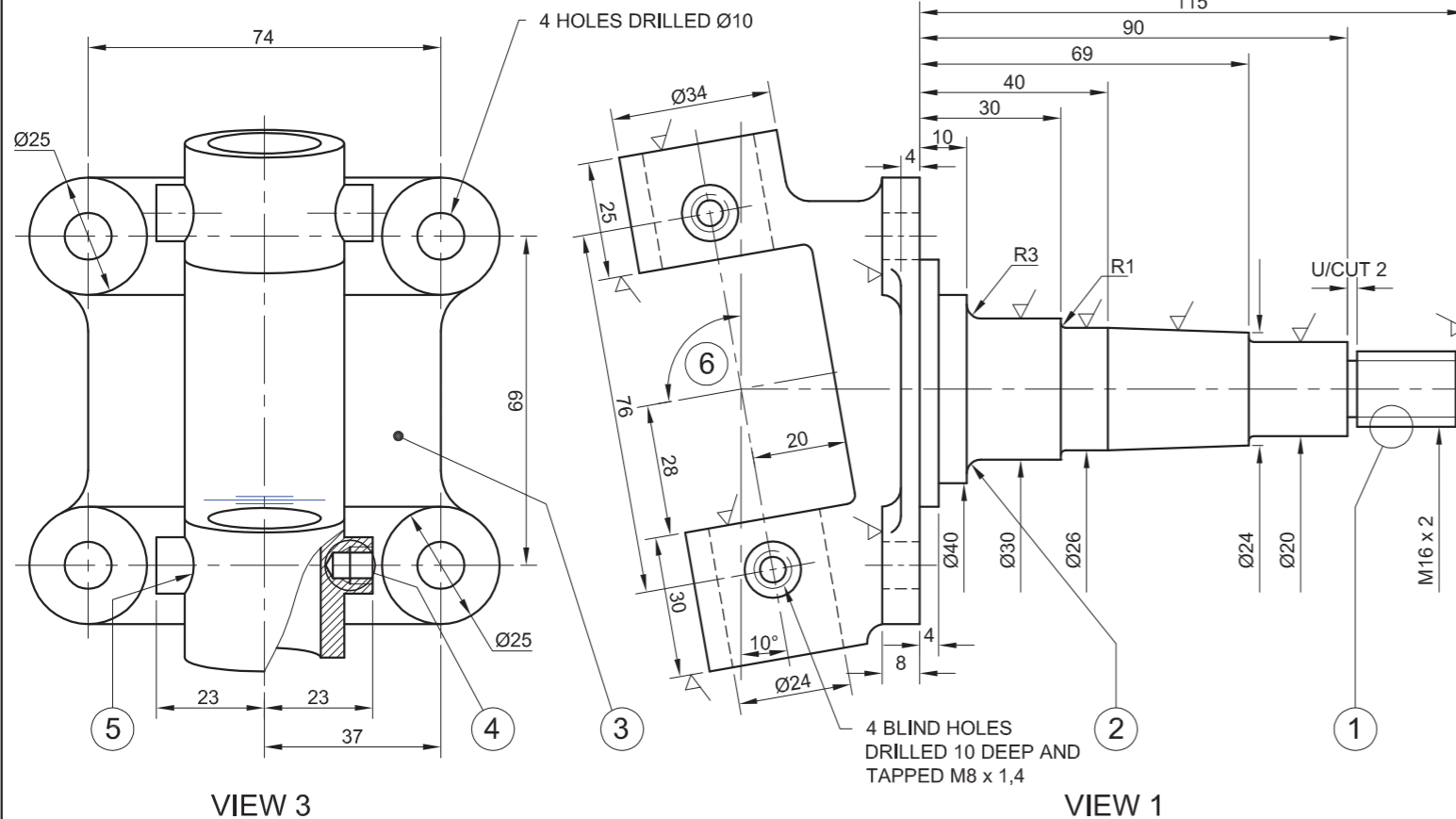
123 STRUBEN STR Pretoria www.jpwdevelopments.co.za 012 345 6789	
TITLE	<b>BRASS TAP</b>

ANSWER 18	
EXAMINATION NUMBER	
EXAMINATION NUMBER	
<b>2</b>	





VIEW 2



VIEW 3

VIEW 1

**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

A detailed drawing of a front stub axle, a title block and a table of questions. The drawing has not been prepared to the indicated scale.

**Instructions:**

Complete the table below by neatly answering the questions, which all refer to the accompanying drawing and the title block. [30]

QUESTIONS		ANSWERS	
1	On what date was the drawing checked?		1
2	What is the name of the engineering firm?		1
3	What scale is indicated for the drawing?		1
4	What treatment must the stub axles undergo?		1
5	On what date was the axle angle revised?		1
6	What is the drawing number?		1
7	What would VIEW 1 be called?		1
8	How many surfaces need to be machined?		1
9	How many threaded holes are there in the stub axle?		1
10	What production method is required to achieve the finish on the stub axle?		1
11	What type of section is shown in VIEW 3?		1
12	Name the encircled feature at 1.		1
13	Name the feature at 2.		1
14	What is the thickness of the feature at 3?		1
15	Name the encircled feature at 4.		2
16	Name the type of curve at 5.		2
17	Determine the angle between the centre lines at 6.		2
18	What is the depth of the undercut?		2
19	Determine the complete dimensions at: A B C D		4
20	In the space provided in the title block (ANSWER 20), draw, in neat freehand, the symbol for the projection system used.		4
<b>TOTAL</b>			<b>30</b>

ALL UNSPECIFIED RADII ARE 5 mm.	
ALL DIMENSIONS ARE IN MILLIMETRES.	SCALE: 1 : 2
DRAWING PROGRAM: AUTOCAD 2008	MATERIAL: CAST IRON
FILE NAME: T-SA FS AXLE.dwg	QUANTITY: 9 500 UNITS
DRAWING No. AWF 3628 W	TREATMENT: HARDENING
REMOVE ALL BURRS AND SHARP EDGES.	TURNING 0,25
<b>PRECISION</b> ENGINEERING	54 SOMTSEU ROAD KINGSMEAD DURBAN 4000 031 335 1600
TITLE <b>FRONT STUB AXLE</b>	

ANSWER 20

2. AXLE HOLES	2013/05/16
1. AXLE ANGLE	2013/05/15
<b>REVISIONS</b>	<b>DATE</b>
DRAWN: JVL	2013/04/10
CHECKED: KC	2013/05/12
APPROVED: SC	2013/05/22

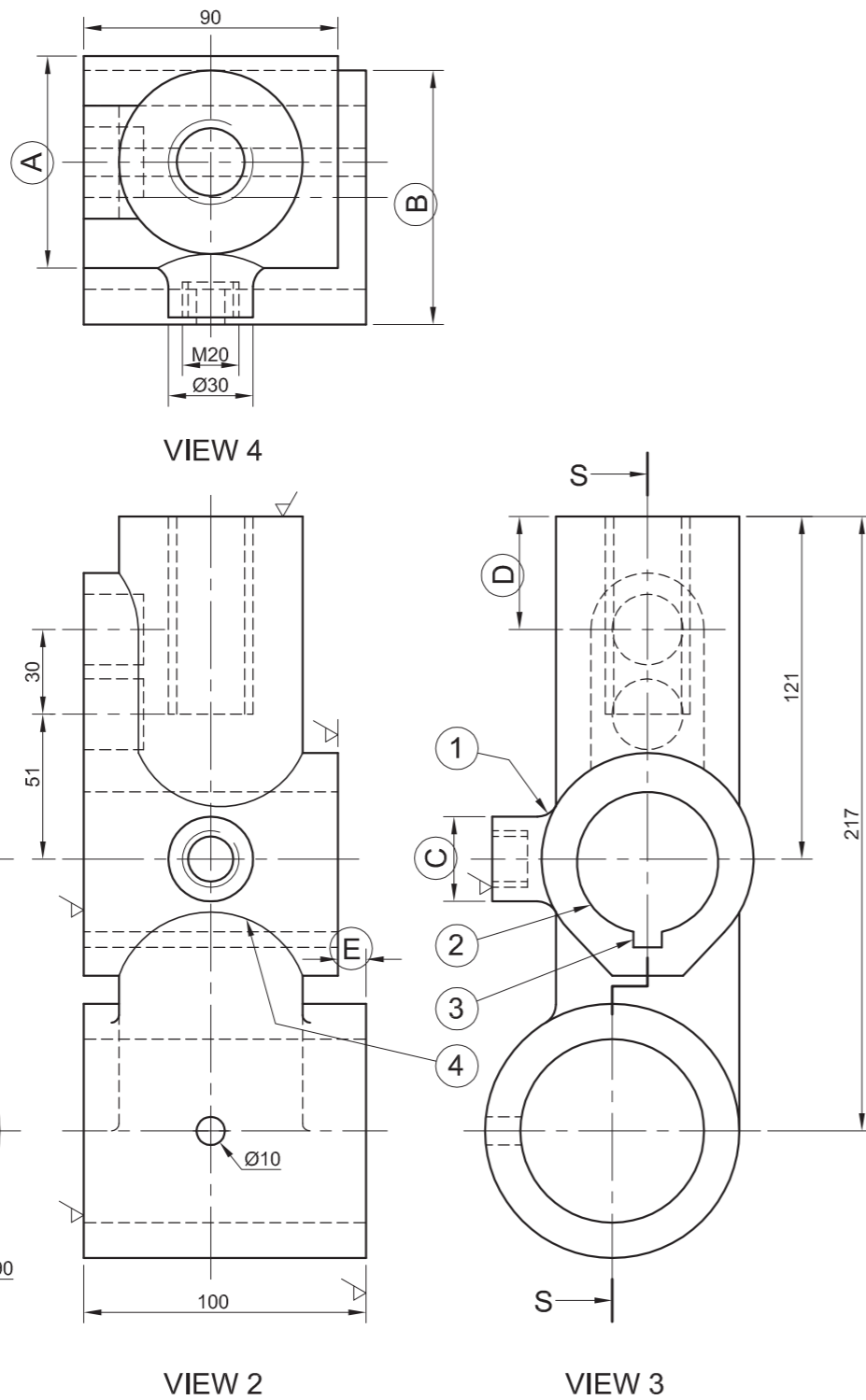
SYMBOL



BASIC EDUCATION

EXAMINATION NUMBER	
EXAMINATION NUMBER	2

STAPLE



**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

A detailed drawing showing FOUR views of a connector, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

**Instructions:**

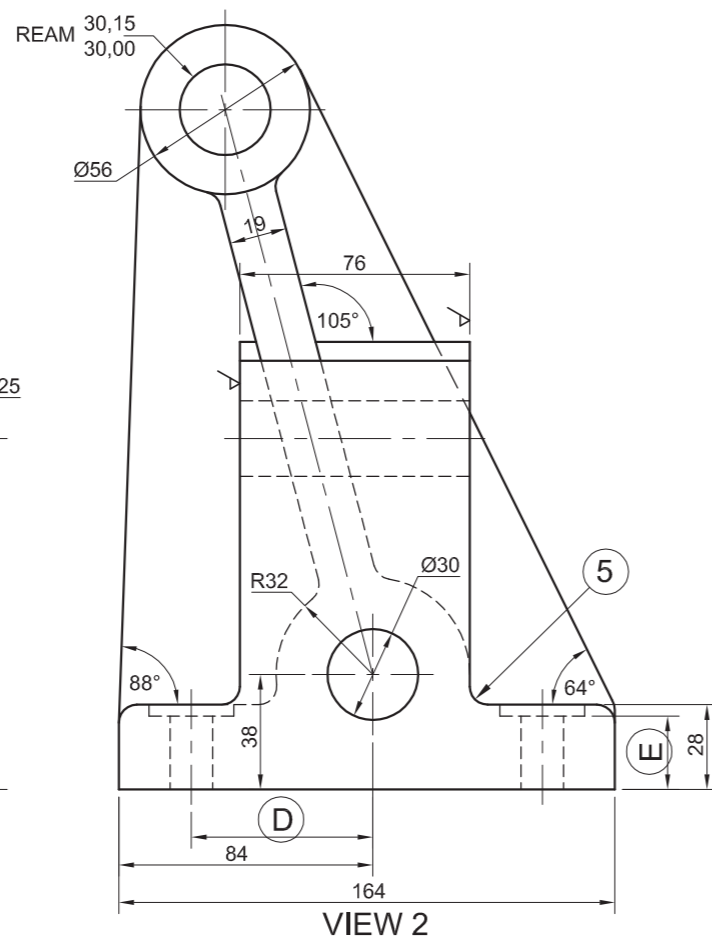
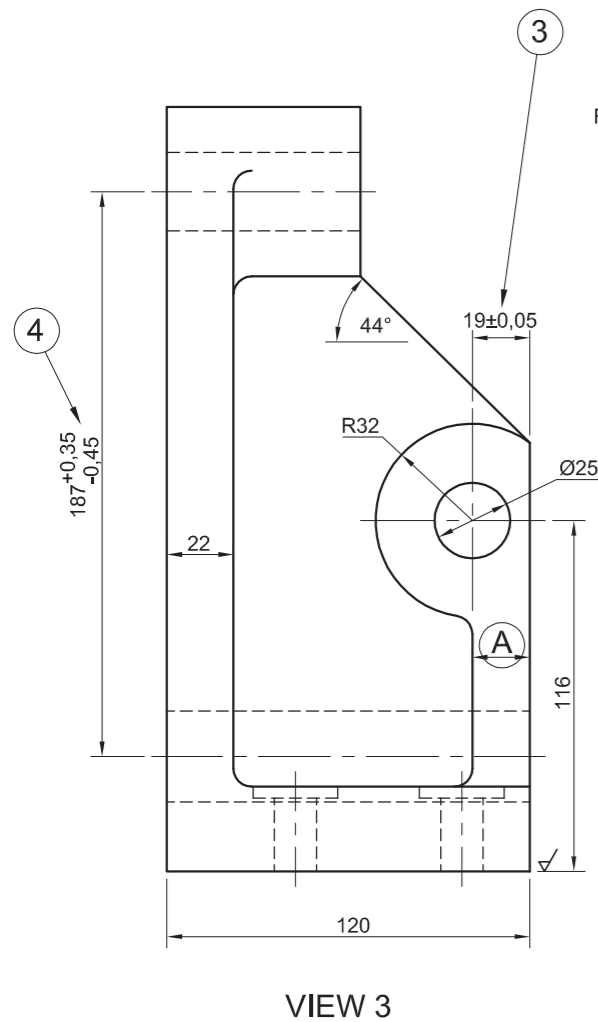
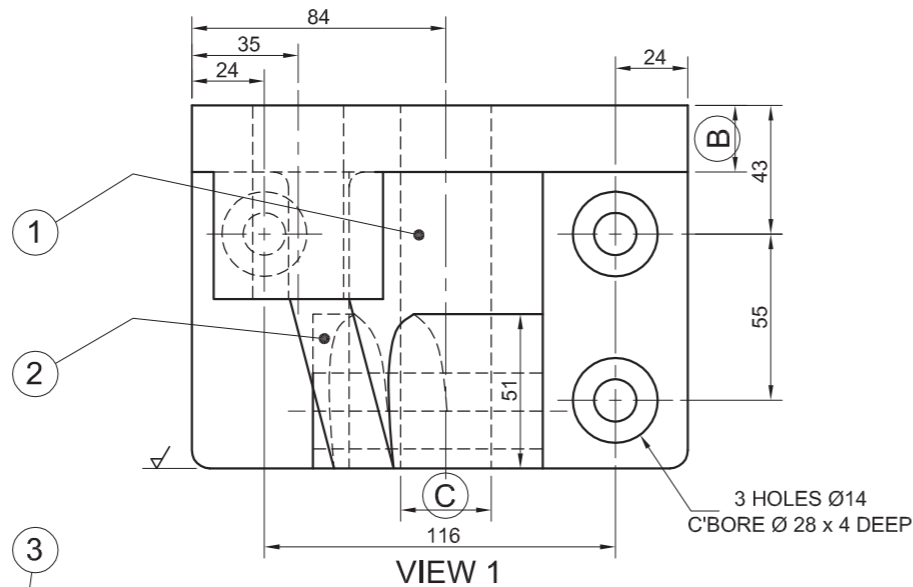
Complete the table below by neatly answering the questions, which all refer to the accompanying detailed drawing and the title block. [30]

QUESTIONS		ANSWERS	
1	On what date was the drawing approved?		½
2	What is the file name of the drawing?		½
3	What was the nature of the first revision?		½
4	What material is the connector made of?		½
5	What is the radius of the unspecified curves?		½
6	How many surfaces require machining?		½
7	What method must be used to produce the machined surfaces?		1
8	What does N4 on the machining symbol represent?		1
9	Name the curve at 1.		1
10	What is the diameter of the circle at 2?		1
11	Name the slot at 3.		1
12	Name the curve at 4.		1
13	What is the tolerance on the unspecified dimensions?		1
14	What is the distance between the centres of the two holes at 5?		1
15	How many threaded holes are there on the connector?		1
16	What is the total height of the connector?		1
17	What would VIEW 4 be called?		1
18	What type of sectional view would result from cutting plane SS?		1
19	Determine the complete dimensions: A                      B                      C                      D                      E		5
20	What is the upper tolerance of the dimension at 6?		2
21	What is the upper and lower tolerance of the dimension at 7?		4
22	In the box below (ANSWER 22), draw, in neat freehand, the symbol for the projection system used.		4
<b>TOTAL</b>			<b>30</b>

				ALL DIMENSIONS ARE IN MILLIMETRES. ALL UNSPECIFIED RADII ARE 2,5 mm.	
2012-08-06	MARYNA	ADD MACHINING SYMBOLS	2	UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS ARE ± 0,3.	
2012-08-04	MARYNA	INCREASE TOLERANCE	1		QUANTITY: 76
DATE	REVISED BY	REVISION DESCRIPTION	№	DRAWN BY: NOLWAZI	DATE: 2012-07-15
<p><b>PRECISION</b> ENGINEERING WORKS</p> <p>15 DYER STREET EAST LONDON www.precision.co.za 043 645 7820</p>				CHECKED BY: AKHEEL	DATE: 2012-07-18
				APPROVED BY: DANIEL	DATE: 2012-07-19
				MATERIAL: CAST IRON	FILE NAME: UFF 335.dwg
				HEAT TREATMENT: NONE	DRAWING No. 12-0967-msc
TITLE: <b>CONNECTOR</b>				SCALE: 1 : 2	



EXAMINATION NUMBER	
EXAMINATION NUMBER	2



ALL DIMENSIONS ARE IN MILLIMETRES.

**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

A detailed drawing showing THREE views of an ejector base, a title block and a table of questions. The drawing has not been prepared to the indicated scale.

**Instructions:**

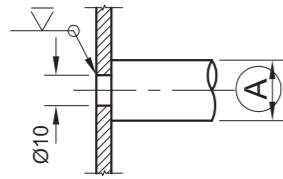
Complete the table below by neatly answering the questions, which all refer to the accompanying detailed drawing and the title block. [30]

QUESTIONS		ANSWERS	
1	Who approved the drawing?		½
2	What SI unit are the dimensions presented in?		½
3	When was the drawing checked?		½
4	Who was responsible for the revision?		½
5	What drawing method was used to prepare the drawing?		½
6	How many ejector bases must be manufactured?		½
7	How many surfaces require machining?		1
8	What is the roughness value of the machined surfaces?		1
9	What method must be used to produce the machined surfaces?		1
10	What is the angle to the horizontal of the surface at 1?		1
11	What is the angle to the horizontal of the surface at 2?		1
12	How many holes are there in the casting?		1
13	What does the abbreviation C'BORE stand for?		1
14	What would VIEW 2 be called?		1
15	What is the radius of the fillet at 5?		1
16	Determine the complete dimensions at: A B C D E		5
17	What is the total height of the ejector base?		3
18	What is the upper tolerance of the dimension at 3?		2
19	What is the upper and lower tolerance of the dimension at 4?		4
20	In the box below (ANSWER 20), draw, in neat freehand, the symbol for the projection system used.		4
<b>TOTAL</b>			<b>30</b>

UNLESS OTHERWISE SPECIFIED, ALL TOLERANCES ON DIMENSIONS ARE ± 0,3. ALL UNSPECIFIED RADII ARE 6 mm.				0,03 GRINDING	SCALE: 1 : 2	ANSWER 20
2012-08-03	S GOBA	REDUCE TOLERANCE VALUES	1	MATERIAL: CAST IRON	DRAWING PROGRAMME: AUTOCAD	<div style="border: 1px solid black; height: 100px; width: 100%;"></div>
DATE	REVISED BY	REVISION DESCRIPTION	No.	HEAT TREATMENT: NORMALISE	FILE NAME: TLS30.dwg	
<b>MASTERCAST</b> ENGINEERING 29 BURMAN ROAD DEALPARTY PORT ELIZABETH 6025 www.mtech.co.za 041 545 7820				DRAWN BY: K MOODLEY	DRAWING No. 12-729-KM3	
				CHECKED BY: L MBELE	DATE: 2012-07-15	
TITLE				APPROVED BY: J BURGER	DATE: 2012-07-18	
<b>EJECTOR BASE</b>				QUANTITY: 382	DATE: 2012-07-19	

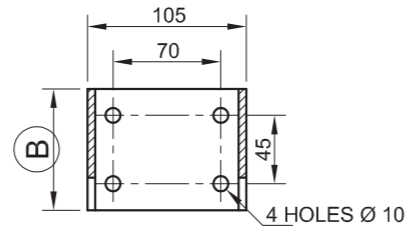
EXAMINATION NUMBER	
EXAMINATION NUMBER	2



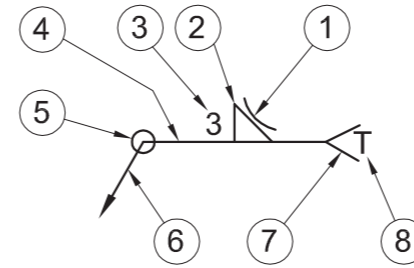


WELDING DETAIL FOR ALL THE HORIZONTAL BARS

DETAIL 'R'



VIEW 1



WELDING SYMBOL

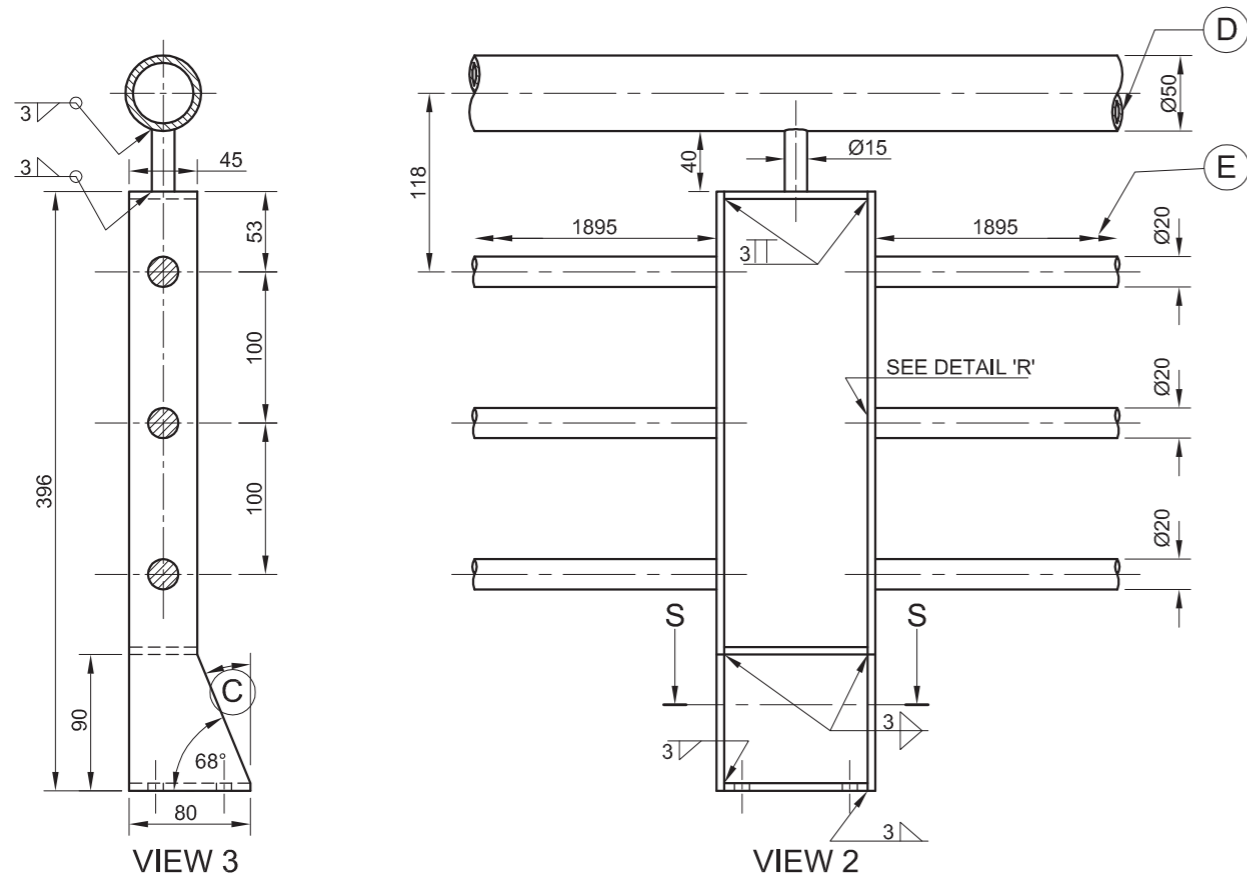
**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

A selection of views of a balustrade bracket, a welding symbol, a title block and a table of questions. The drawings have not been prepared to the indicated scale.

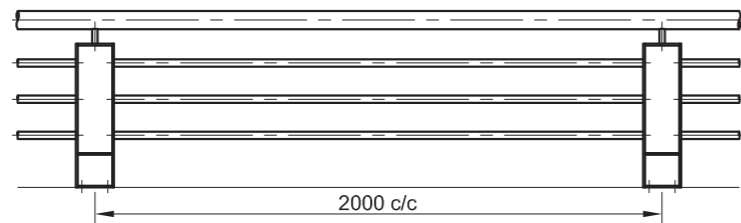
**Instructions:**

Complete the table below by neatly answering the questions, which all refer to the accompanying drawings and the title block. **[30]**



VIEW 3

VIEW 2



INSTALLATION DIAGRAM

QUESTIONS		ANSWERS		
1	With reference to the welding symbol, link the number on the drawing with the correct element in the column to the right of this question.	ARROW LINE		7
		TAIL		
		REFERENCE LINE		
		WELDING PROCESS		
		CONCAVE FINISH		
		WELD ALL AROUND		
	SIZE OF WELD			
2	When was the drawing approved?			1
3	What is the manufacturing company's web address?			1
4	What finish is required for the balustrade?			1
5	What is the file name?			1
6	What is the thickness of the plate used on the bracket?			1
7	How many brackets must be manufactured?			1
8	What would view 1 be called?			1
9	What would view 3 be called?			1
10	What size bolt is needed to secure the bracket?			1
11	Determine the dimensions:                    A                    B                    C			3
12	What is the centre-to-centre distance between two brackets?			1
13	How many surfaces need to be welded on each bracket?			2
14	What is feature D called on view 2?			1
15	What is the meaning of the double arrow at E?			1
16	If the permissible tolerance on a dimension is $\pm 0,5$ , determine the upper and lower tolerance on a dimension of 30 mm.			2
17	In the box below, draw, in neat freehand, the symbol for the projection system used.			4
<b>TOTAL</b>				<b>30</b>

FILE NAME: PM 12-PSC-347	MATERIAL: 5 mm MILD STEEL PLATE	ALL DIMENSIONS ARE IN MILLIMETRES.	
DRAWING No. 7	FINISH: CHROME PLATED	DRAWN BY: HAROLD	2011/05/15
BALUSTRADE FOR PIET AND SONS CONTRACTORS 17 WALDO STREET DURBAN	DRAWING PROGRAMME: AUTOCAD 2008	CHECKED BY: SALLY	2011/05/25
	ALL UNSPECIFIED RADII ARE R3.	APPROVED BY: GEORGE	2011/06/01
<b>WELDTech</b> ENGINEERING	51 PARK AVENUE NEWLANDS 4070 www.weldtech.co.za 031 645 7820	SCALE: 1 : 10	
		QUANTITY: 26 BRACKETS	
TITLE	<b>BALUSTRADE BRACKET</b>		

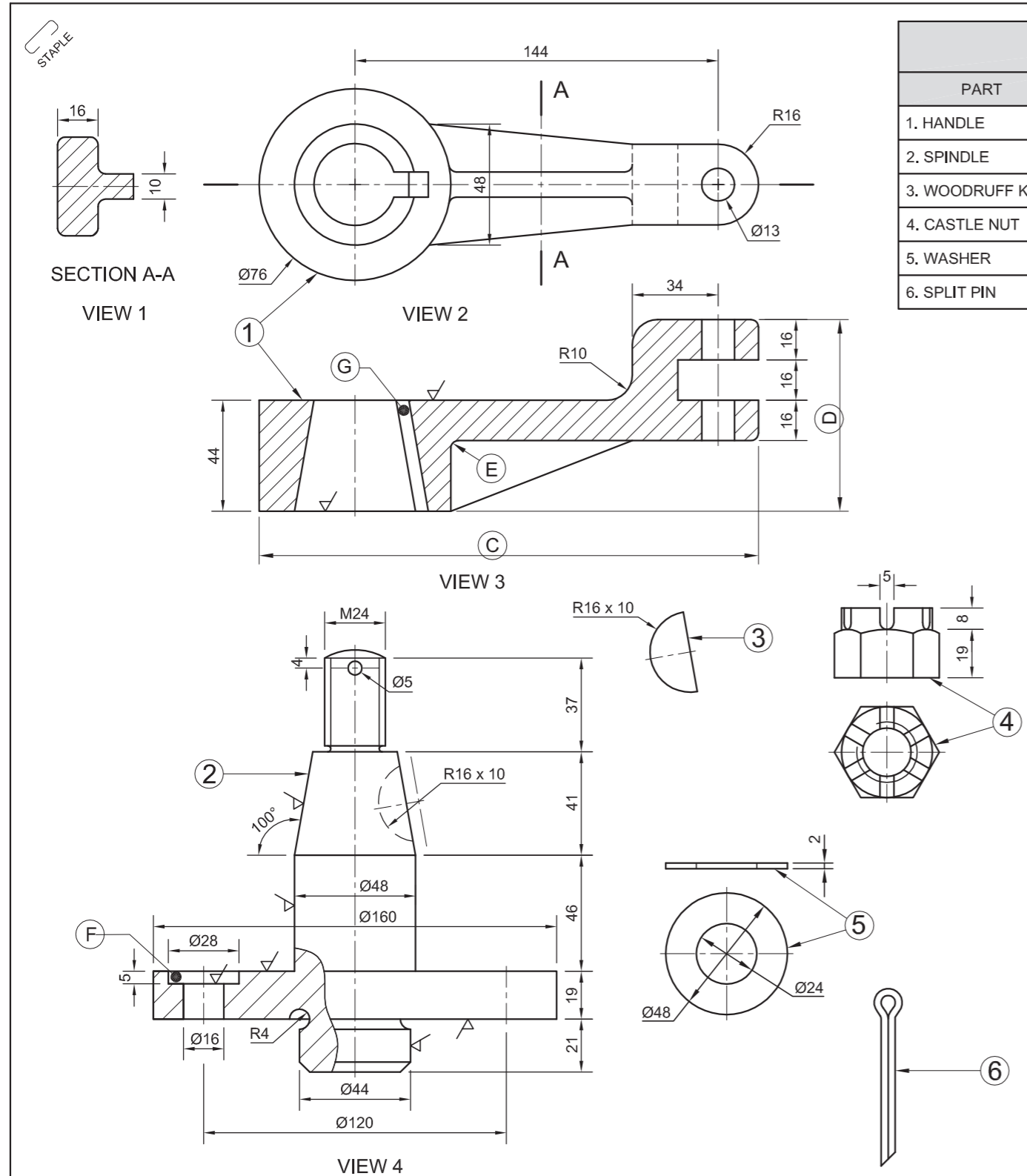
ANSWER 17

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SYMBOL

EXAMINATION NUMBER	
EXAMINATION NUMBER	2





PARTS LIST		
PART	QUANTITY	MATERIAL
1. HANDLE	1	MILD STEEL
2. SPINDLE	1	MILD STEEL
3. WOODRUFF KEY	1	HARDENED STEEL
4. CASTLE NUT	1	HARDENED STEEL
5. WASHER	1	MILD STEEL
6. SPLIT PIN	1	SPRING STEEL

**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Six parts of a crank handle with a title block and a table of questions.

**Instructions:**

Complete the table below by neatly answering the questions, which all refer to the accompanying drawings and the title block. **[25]**

QUESTIONS		ANSWERS	
1	On what date was the drawing drawn?		1
2	What is the file name of the drawing?		1
3	In which street is the manufacturing company situated?		1
4	Who made changes to the drawing?		1
5	What scale is indicated for the drawing?		1
6	What is the tolerance allowed on the dimensions?		1
7	What type of section is indicated with view 1?		1
8	What would VIEW 3 be called?		1
9	How many surfaces must be machined on VIEW 4?		1
10	What is the thickness of the Woodruff key?		1
11	Determine the dimensions at C and D.	<b>C</b>	<b>D</b>
12	What is the size of the arc at E?		1
13	What is the feature at F called?		1
14	What is the feature at G called?		1
15	What is the purpose of the castle nut?		1
16	What is the purpose of the split pin?		1
17	What type of section is indicated on VIEW 4?		1
18	What is the purpose of the Woodruff key in the crank-handle assembly?		1
19	Draw the arrows for the cutting plane located on VIEW 2 and label it B-B.		2
20	In the box below (ANSWER 20), draw, in neat freehand, the symbol for the projection system used.		4
<b>TOTAL</b>			<b>25</b>

13/12/2010	STEVEN	INSERT KEY AND KEYWAY	A
ALL DIMENSIONS ARE IN MILLIMETRES.	DATE	CHANGED BY	REVISION DESCRIPTION
UNLESS OTHERWISE SPECIFIED TOLERANCES ON DIMENSIONS ARE ± 0,15.	DRAWN BY: JOHAN	DRAWING NO. 2	MATERIAL: MILD AND HARDENED STEEL
	DATE: 05/11/2010	FILE NAME: CRANK_003	HEAT TREATMENT: NORMALISE
ALL UNSPECIFIED RADII ARE R3.	CHECKED BY: DE WET	<p style="text-align: center;"><b>MAXSTEEL</b></p> GOVAN MBEKI DRIVE PORT ELIZABETH 6001 www.maxsteel.co.za	
	DATE: 10/11/2010		
APPROVED BY: ALIDA			
DRAWING PROGRAM: AUTOCAD 2008	DATE: 20/11/2010	<b>CRANK HANDLE</b>	
	SCALE: 1 : 2		

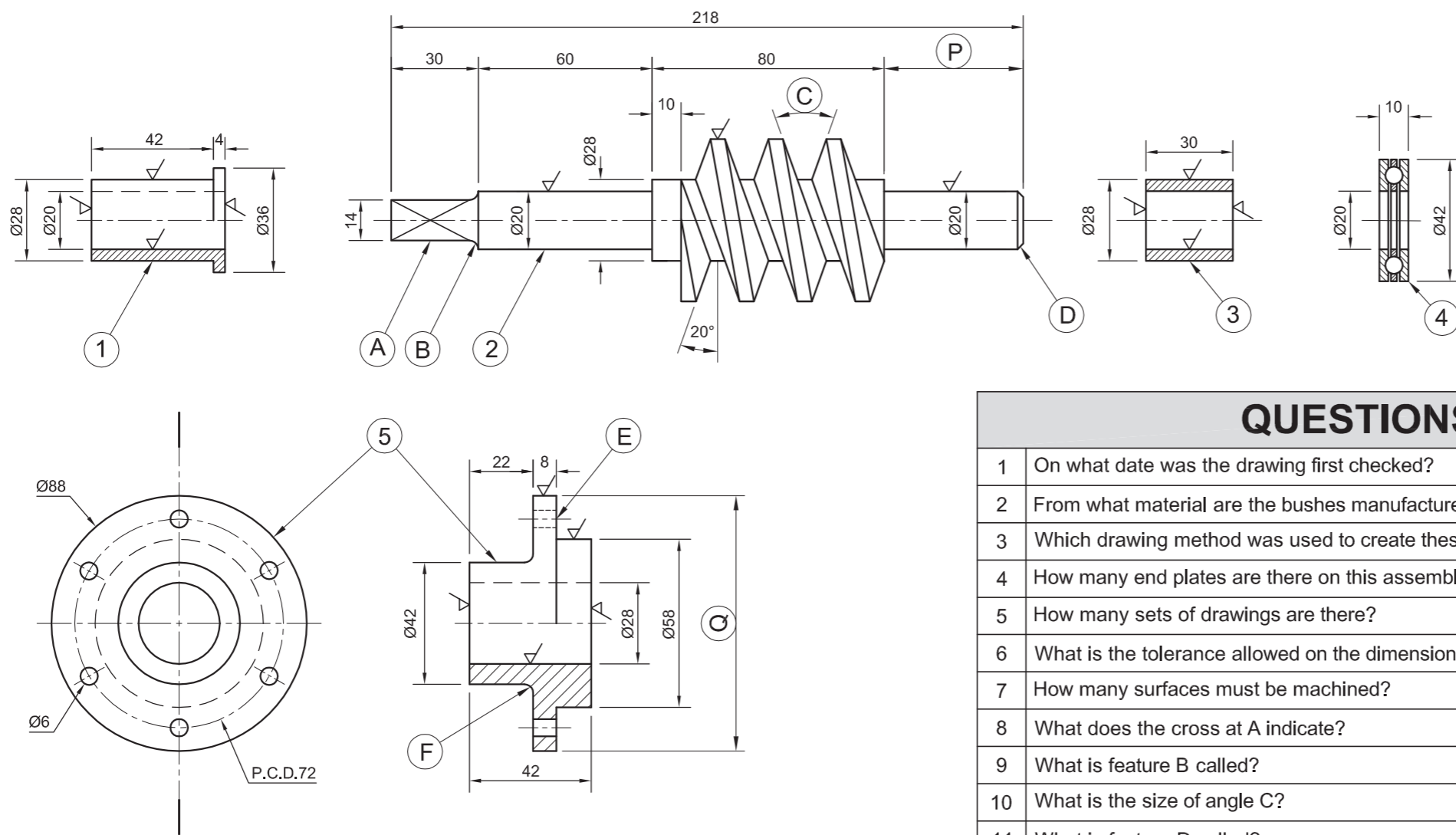
ANSWER 20

\_\_\_\_\_

SYMBOL

EXAMINATION NUMBER	
EXAMINATION NUMBER	2





**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Five parts of a worm gear assembly with a title block and a table of questions

**Instructions:**

Complete the table below by neatly answering the questions, which all refer to the accompanying drawings and title block. [30]

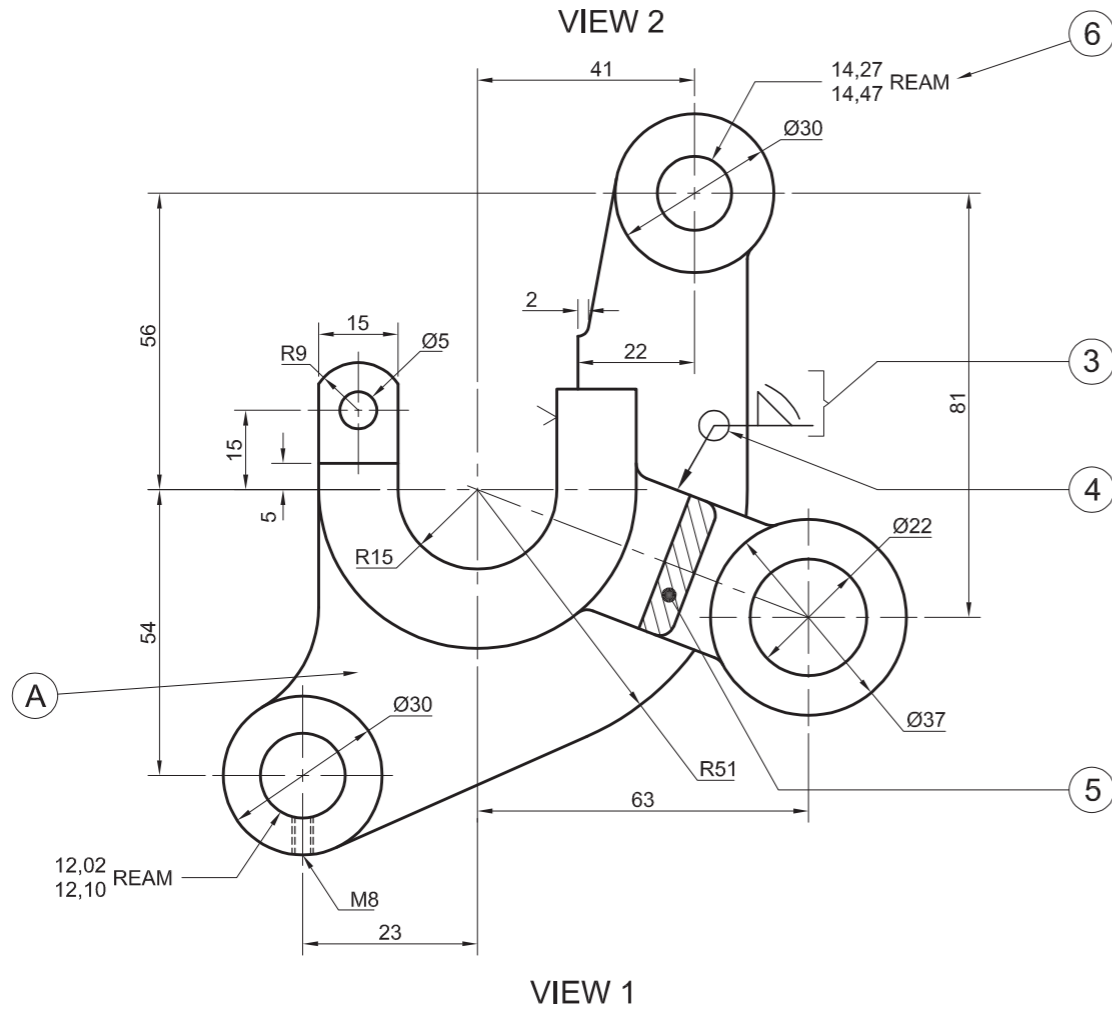
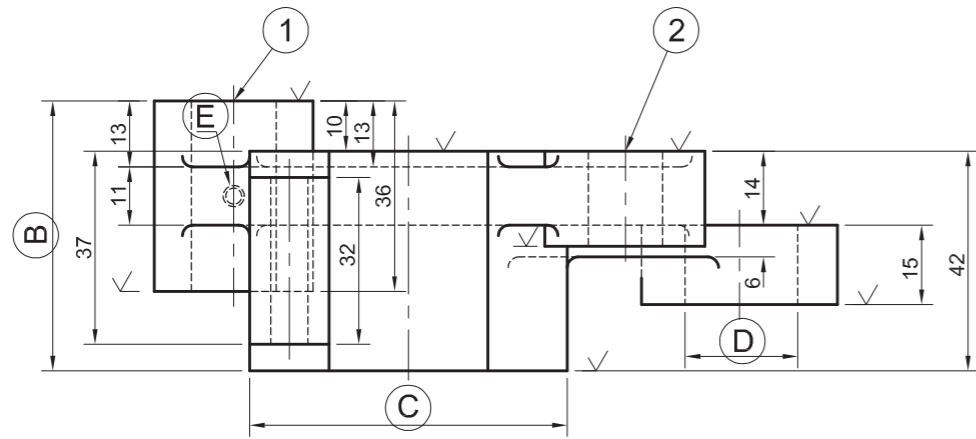
PARTS LIST		
PART	QUANTITY	MATERIAL
1. BUSH	1	BRASS
2. WORM	1	CASE-HARDENED STEEL
3. BUSH	1	BRASS
4. BEARING	1	CASE-HARDENED STEEL
5. END PLATE	1	MILD STEEL

QUESTIONS		ANSWERS	
1	On what date was the drawing first checked?		1
2	From what material are the bushes manufactured?		1
3	Which drawing method was used to create these drawings?		1
4	How many end plates are there on this assembly?		1
5	How many sets of drawings are there?		1
6	What is the tolerance allowed on the dimensions?		1
7	How many surfaces must be machined?		1
8	What does the cross at A indicate?		1
9	What is feature B called?		1
10	What is the size of angle C?		1
11	What is feature D called?		1
12	What is the size of the hole marked E?		1
13	What is the size of the arc marked F?		1
14	What type of section is shown on part 1?		1
15	Determine the dimensions at:	P	Q
16	What do the letters P.C.D. stand for?		1
17	How many bolts will be used to secure the end plate?		1
18	Draw the arrows for the cutting plane located on part 5 and label it A-A.		2
19	In the box below (ANSWER 19), draw, in neat freehand, the symbol for the projection system used.		4
20	In the box below (ANSWER 20), draw, in neat freehand, the SABS 0111 convention for part 4.		6
<b>TOTAL</b>			<b>30</b>

ALL DIMENSIONS ARE IN MILLIMETRES.	15/05/2010	MICHELLE	ANGLE OF GEARS	A
	DATE	CHANGED BY	REVISION DESCRIPTION	No
UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS ARE ± 0,25.	DRAWN BY: JOSHUA	DRAWING SET NO. 3 OF 4		MATERIAL: VARIOUS
	DATE: 20/04/2010	FILE NAME: P-S2-B4		HEAT TREATMENT: NONE
ALL UNSPECIFIED RADII ARE R3.	CHECKED BY: KRISTY	<p style="text-align: center;"><b>LONGSTEEL</b></p> RIVER DRIVE EAST LONDON 5247 www.longsteel.co.za MANUFACTURING		
	DATE: 26/04/2010			
DRAWING PROGRAM: AUTOCAD 2008	APPROVED BY: HOLLY	<b>WORM-GEAR ASSEMBLY</b>		
	DATE: 01/05/2010			
	SCALE: 1 : 2			

ANSWER 19	ANSWER 20
SYMBOL	Convention for part 4
EXAMINATION NUMBER	
EXAMINATION NUMBER	





**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

Two views of an adaptor plate with a title block and a table of questions.

**Instructions:**

Complete the table below by neatly printing the answers to the questions, which all refer to the accompanying drawings and the title block. [30]

QUESTIONS		ANSWERS
1	What is the title of the drawing?	1
2	On what date was the drawing checked?	1
3	Who approved the drawing?	1
4	What is the drawing number?	1
5	If a scale of 1:5 were used, what would a dimension of 10 mm read?	1
6	How many surfaces on the component require machining?	1
7	What process must be applied to achieve the required finish?	1
8	As what type of mechanical drawing can the views of the adaptor plate be classified?	1
9	What would VIEW 2 be called?	1
10	What is the thickness of the rib marked A?	1
11	Determine the dimensions at: B C D E	4
12	What is the linear distance between holes 1 and 2?	1
13	What type of symbol is shown at 3?	1
14	What does the circle on the symbol at 4 mean?	1
15	What type of section is shown at 5?	1
16	What is the permissible tolerance on the dimensions of the component?	1
17	Determine the tolerance for the dimension at 6.	2
18	In the box below, draw, in neat freehand, the symbol for the projection system used.	4
19	In the box below, draw, in neat freehand, the SABS 0111 convention for the given internal screw thread.	5
<b>TOTAL</b>		<b>30</b>

12-06-09	MUSA	CHANGE MACHINING SPEC'	B	ALL DIMENSIONS ARE IN MILLIMETRES.
07-06-09	MUSA	DECREASE RIB THICKNESS	A	ALL SPECIFIED SURFACE FINISHES ARE: $0,05$ GRINDING
DATE	CHANGED BY	REVISION DESCRIPTION	No.	
DRAWING No. Q1/DOE/10		MATERIAL: CAST ALUMINIUM		THE TOLERANCE ON DIMENSIONS IS $\pm 0,3$ , UNLESS OTHERWISE SPECIFIED.
FILE NAME: FM-P2-2010		HEAT TREATMENT: NONE		
<b>eBHAYI</b>		73 ACACIA AVENUE PORT ELIZABETH 6001		DRAWING PROGRAM: AUTOCAD 2009
ENGINEERING PTY (LTD)		041 645 7820		DRAWN BY: AB MORKEL 20/05/09
TITLE <b>ADAPTOR PLATE</b>		CHECKED BY: Z KHUMALO 25/05/09		
		APPROVED BY: PP STEYN 07/06/09		
		SCALE: 1:2		

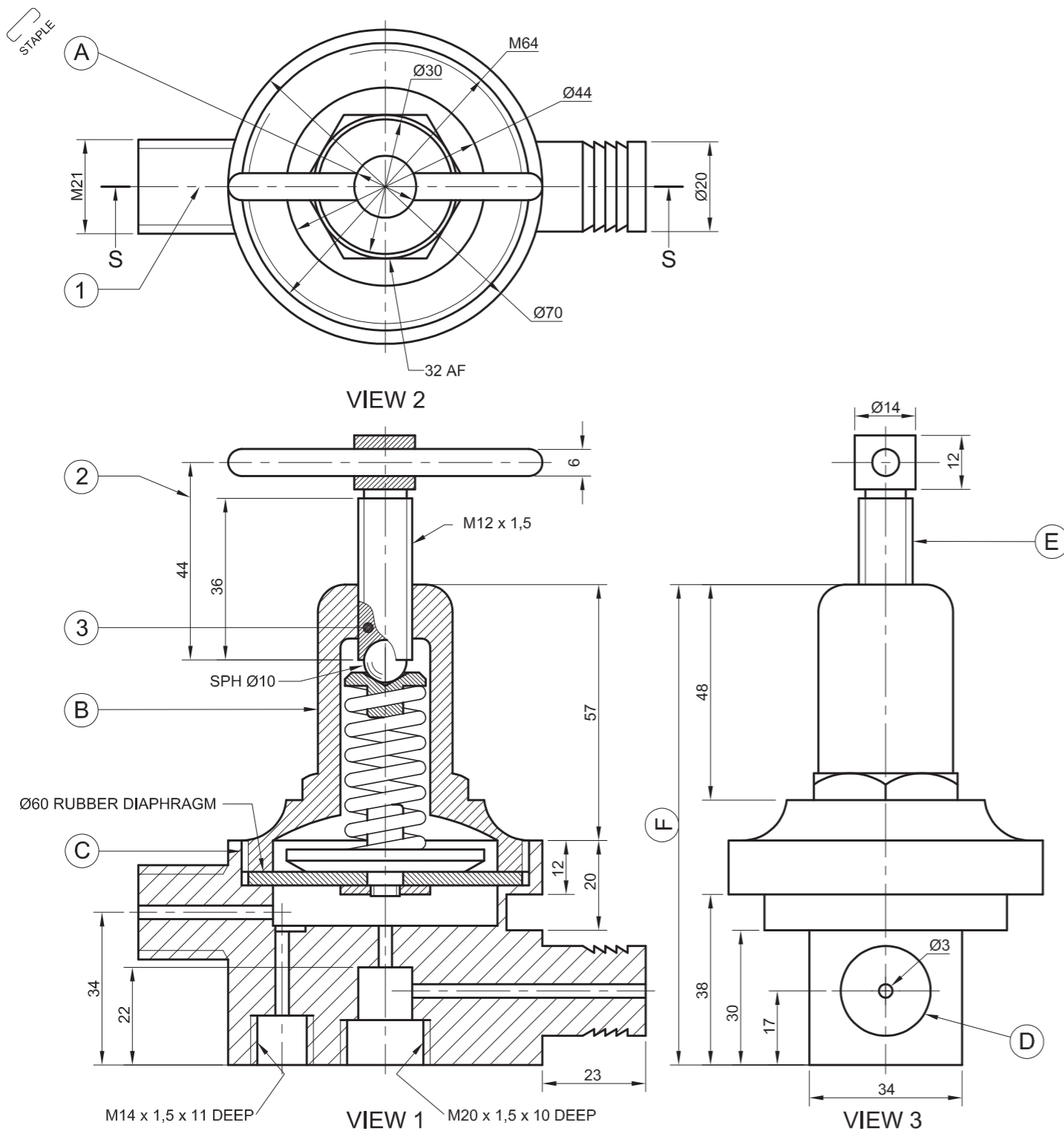
18

SYMBOL

19

SABS 0111 convention

EXAMINATION NUMBER	
EXAMINATION NUMBER	2



**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

The working drawings of a diaphragm regulator with a title block and a table of questions.

**Instructions:**

Complete the table below by neatly printing the answers to the questions, which all refer to the accompanying drawings and the title block. [30]

QUESTIONS		ANSWERS	
1	On what date was the revision completed?		1
2	Who checked the drawing?		1
3	What is the title of the drawing?		1
4	What scale is indicated for the drawing?		1
5	From what material are the metal components of the regulator made?		1
6	How many internal screw threads are there in the assembly?		1
7	How many parts make up the assembly?		1
8	What orthographic projection system has been used?		1
9	What would VIEW 3 be called?		1
10	What would VIEW 2 be called?		1
11	What is the outer diameter of the rubber diaphragm?		1
12	What is the diameter of the sphere?		1
13	Determine the dimensions at: A B C D E F		6
14	What drawing feature is shown at 1?		1
15	What drawing feature is shown at 2?		1
16	What type of section is shown at 3?		1
17	What does the machining symbol $\sqrt{\quad}$ mean?		2
18	In the block below, draw, in neat freehand, the simplified SABS 0111 convention for a spring.		4
19	What is the permissible tolerance on the components of the regulator?		1
20	Determine the upper limit of tolerance for a dimension of 34 mm.		2
<b>TOTAL</b>			<b>30</b>

12/05/09	MARIE	DIAMETER OF INLETS	A
DATE	CHANGED BY	REVISION DESCRIPTION	No

**DIAPHRAGM REGULATOR**

**EGD ENGINEERING**  
(SA) (PTY) LTD

188 SCHOEMAN STREET  
PRETORIA  
0001  
www.egdengineering.co.za  
012 555 2345

DRAWING SYSTEM: AutoCAD 2009

DRAWING No. LFN/304/2009

FILE NAME: D5-Y2

UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE IN MILLIMETRES WITH A TOLERANCE OF 0,25.

UNLESS OTHERWISE SPECIFIED, ALL SURFACE TEXTURE FINISHES ARE  $\sqrt{\quad}$

DRAWN: MANDLA 20/03/09

CHECKED: CARLA 29/03/09

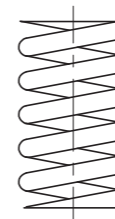
APPROVED: ROELF 03/04/09

MATERIAL: BRASS

HEAT TREATMENT: NORMALISE

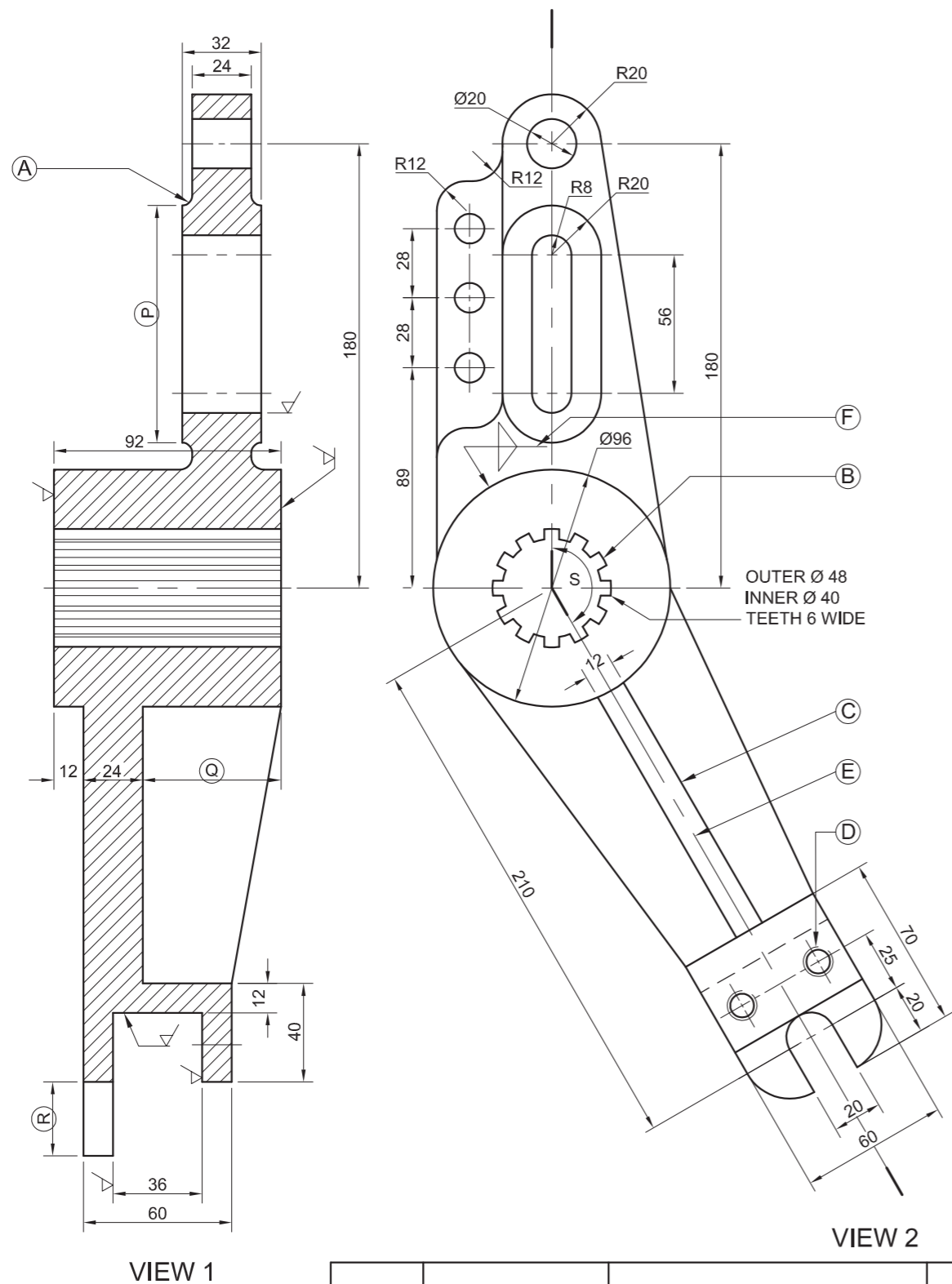
SCALE: 1:2

18.



Convention for the spring

EXAMINATION NUMBER	
EXAMINATION NUMBER	2



**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**

A table of questions and a working drawing.

**Instructions:**

Complete the table below by neatly printing the answers to the questions, which all refer to the accompanying drawings and the title block. **[29]**

QUESTIONS		ANSWERS
1	On what date was the drawing first completed?	1
2	What material is used to manufacture the bell crank?	1
3	What is the drawing number?	1
4	How many revisions have been made to the drawing?	1
5	Where is the manufacturing company situated?	1
6	What is the tolerance allowed on the dimensions?	1
7	How many surfaces must be machined?	1
8	What is feature <b>A</b> called?	1
9	What is feature <b>B</b> called?	1
10	What is feature <b>C</b> called?	1
11	What is feature <b>D</b> called?	1
12	Name the type of line shown at <b>E</b> .	1
13	Identify the type of symbol shown at <b>F</b> .	1
14	Name the type of section on VIEW 1.	2
15	Determine the dimensions at: <b>P</b> <b>Q</b> <b>R</b>	3
16	What is the size of angle <b>S</b> ?	1
17	What orthographic projection system has been used?	1
18	Draw the arrows for the cutting plane located on view 2 and label it A-A.	2
19	In the box below and in freehand, neatly draw the symbol for the projection system used.	4
20	In the box below and in freehand, neatly draw the SABS 0111 convention used for the feature at <b>B</b> .	3
		<b>TOTAL 29</b>

ALL DIMENSIONS ARE IN MILLIMETRES

15-10-08	KAREN	SPLINE ON MAIN HUB	A
DATE	CHANGED BY	REVISION DESCRIPTION	No

UNLESS OTHERWISE SPECIFIED TOLERANCES ON DIMENSIONS ARE ± 0,25	DRAWN: COLEEN	DRAWING No. S8/ED/01	MATERIAL: CAST IRON
	DATE: 20/02/08	FILE NAME: S-P2-A2	HEAT TREATMENT: NORMALISE
ALL UNSPECIFIED RADII ARE R3	CHECKED: KARL	FOREST DRIVE GOODWOOD 5240 www.capesteel.co.za	
	DATE: 26/02/08		
DRAWING PROGRAMME: AUTOCAD 2008	APPROVED: JESSIE	<b>BELL CRANK</b>	
	DATE: 01/03/08		
	SCALE: 1:2		

19	20
SYMBOL	Convention for feature B

EXAMINATION NUMBER	
EXAMINATION NUMBER	2



**QUESTION 1: ANALYTICAL (MECHANICAL)**

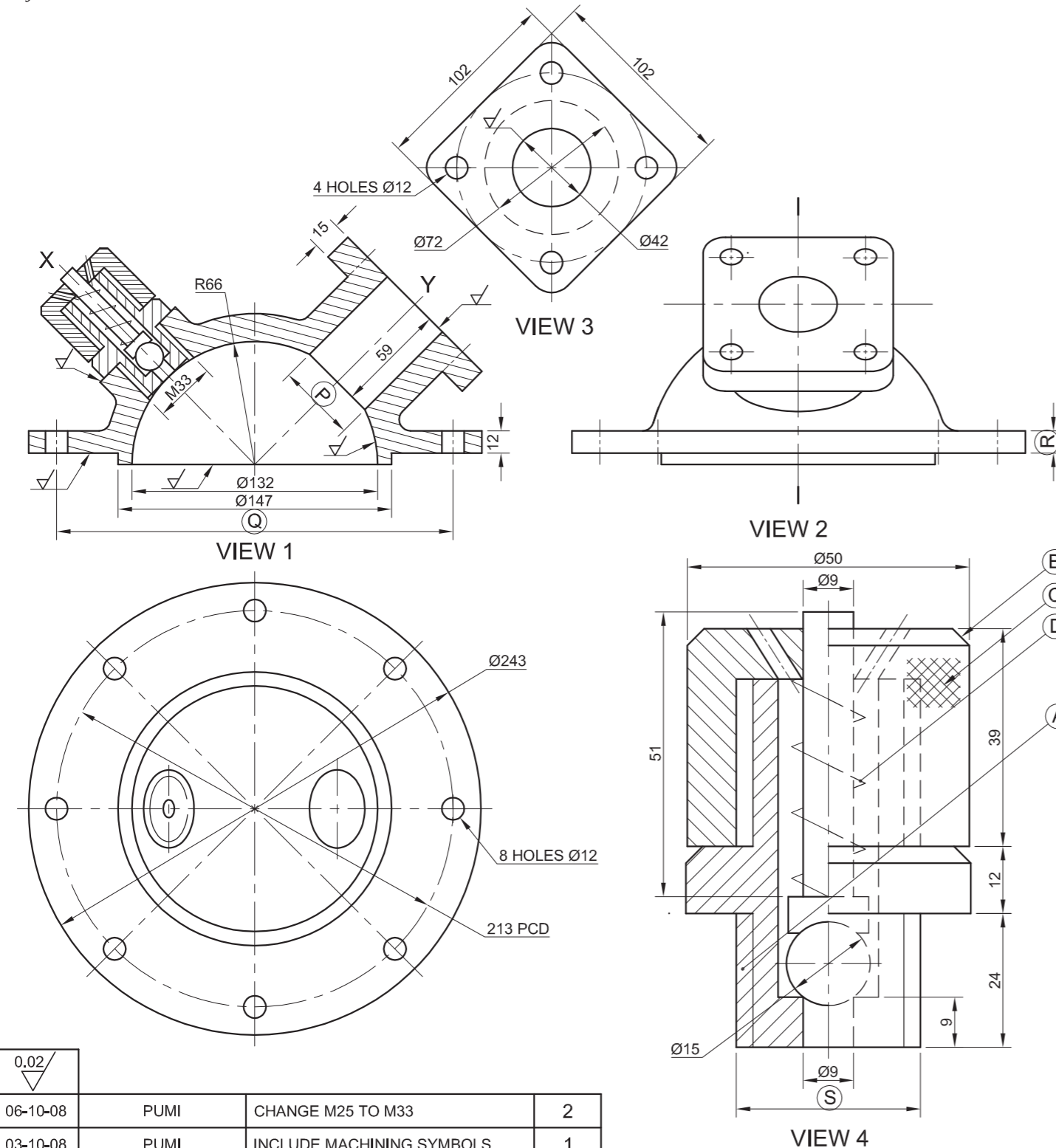
**Given:**

A table of questions and a set of working drawings.

**Instructions:**

Complete the table below by neatly printing the answers to the questions, which all refer to the accompanying drawings and the title block.

[26]



0,02/			
06-10-08	PUMI	CHANGE M25 TO M33	2
03-10-08	PUMI	INCLUDE MACHINING SYMBOLS	1
DATE	CHANGED BY	REVISION DESCRIPTION	№

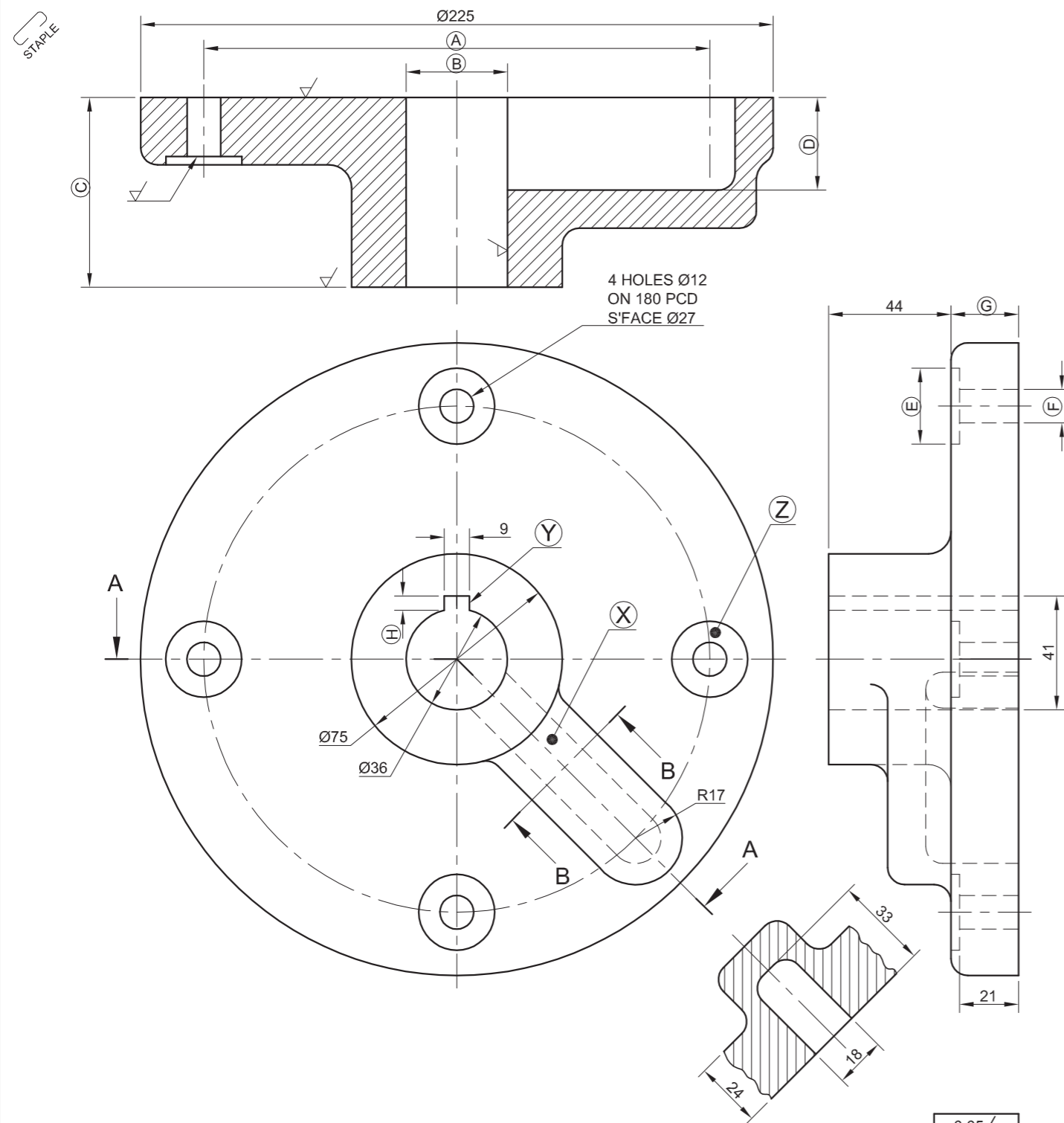
ALL DIMENSIONS ARE IN MILLIMETRES

DRAWING No. N8/DOE/001	MATERIAL: CAST IRON	DRAWN: JOHAN	UNLESS OTHERWISE SPECIFIED TOLERANCES ON DIMENSIONS ARE: ± 0,05
FILE NAME: N-P2-E018	HEAT TREATMENT: NONE	DATE: 25/09/08	
	DIAS STREET EAST LONDON 5240 www.mega.co.za	CHECKED: KENNETH	ALL UNSPECIFIED RADII ARE R4
		DATE: 02/10/08	
<b>CYLINDER HEAD ASSEMBLY</b>		APPROVED: JABU	DRAWING PROGRAMME: AUTOCAD 2008
		DATE: 16/10/08	
		SCALE: 1:5	

QUESTIONS		ANSWERS
1	On what date was the drawing checked?	1/2
2	In which city is the manufacturing company situated?	1/2
3	What is the name of the drawing file?	1/2
4	How many revisions have been made to the drawing?	1/2
5	What is the tolerance allowed on the dimensions?	1/2
6	How many bolts are required to secure the cylinder head to the body?	1/2
7	How many surfaces must be machined?	1
8	What is feature <b>A</b> called?	1
9	What is feature <b>B</b> called?	1
10	What is feature <b>C</b> called?	1
11	What is feature <b>D</b> called?	1
12	How many parts does the assembly consist of?	1
13	What would view 3 be called?	1
14	Name the type of section on: VIEW 1	VIEW 4
15	Determine the dimensions at: P Q R S	4
16	What is the angle between the holes marked <b>X</b> and <b>Y</b> on view 1?	1
17	Draw the arrows for the cutting plane located on view 2 and label it A-A.	3
18	What does the symbol $\sqrt{0,02}$ mean?	1
19	What orthographic projection system has been used?	1
20	In the box below neatly draw, in freehand, the symbol for the projection system used.	4
<b>TOTAL 26</b>		

SYMBOL

EXAMINATION NUMBER	
EXAMINATION NUMBER	2



**QUESTION 1: ANALYTICAL (MECHANICAL)**

**Given:**


A set of working drawings and questions.

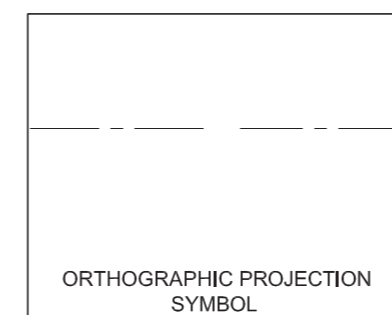
**Instructions:**

Complete the table below by answering the questions which all refer to the accompanying drawings and title block.

[25]

QUESTIONS		ANSWERS
1	On what date was the drawing first completed?	1/2
2	Who redrew the drawing?	1/2
3	What is the name of the manufacturing company?	1/2
4	What is the drawing number?	1/2
5	What dimension unit is used?	1/2
6	What tolerances are allowed on the dimensions?	1
7	What heat treatment is required?	1
8	How many surfaces must be machined?	1
9	What is the width of the slot marked X?	1
10	What is feature Y called?	1
11	What is feature Z called?	1
12	What is the maximum 'M' sized bolt that could be used to hold the crank disc in place?	1
13	If the drawing was drawn full size, what would dimension $\text{Ø}36$ read?	1/2
14	Determine the dimensions at: A B C D	4
15	Determine the dimensions at: E F G H	4
16	What type of section is created by cutting plane B-B?	1
17	What do the letters PCD stand for?	1
18	What does the symbol $\frac{0.05}{\sqrt{\quad}}$ mean?	1
19	Label the TWO sectioned views.	2
20	In the box below neatly draw, in freehand, the symbol for the projection system used.	2
<b>TOTAL 25</b>		

$\frac{0.05}{\sqrt{\quad}}$				
A	REDRAWN:	20/04/07	S-BU	NJUM O
ISSUE	REVISION	DATE	BY	CHECKED
UNLESS OTHERWISE SPECIFIED TOLERANCES ON DIMENSIONS ARE: 2 DECIMAL PLACES: $\pm 0,05$ 3 DECIMAL PLACES: $\pm 0,005$		 <b>TSIMBI</b> CORPORATION TSHEDZA STREET THOHOYANDOU 0950 www.tsimbi.co.za		
ALL UNSPECIFIED RADII ARE R3		TITLE <h2 style="text-align: center;">CRANK DISC</h2>		
DRAWING PROGRAMME: AUTOCAD 2007		MATERIAL: SAE 1040	DRAWING No. TC/DOE/0811	
SCALE: 1:2		HEAT TREATMENT: NORMALISE	FILE NAME: CD-334	



EXAMINATION NUMBER	
EXAMINATION NUMBER	2