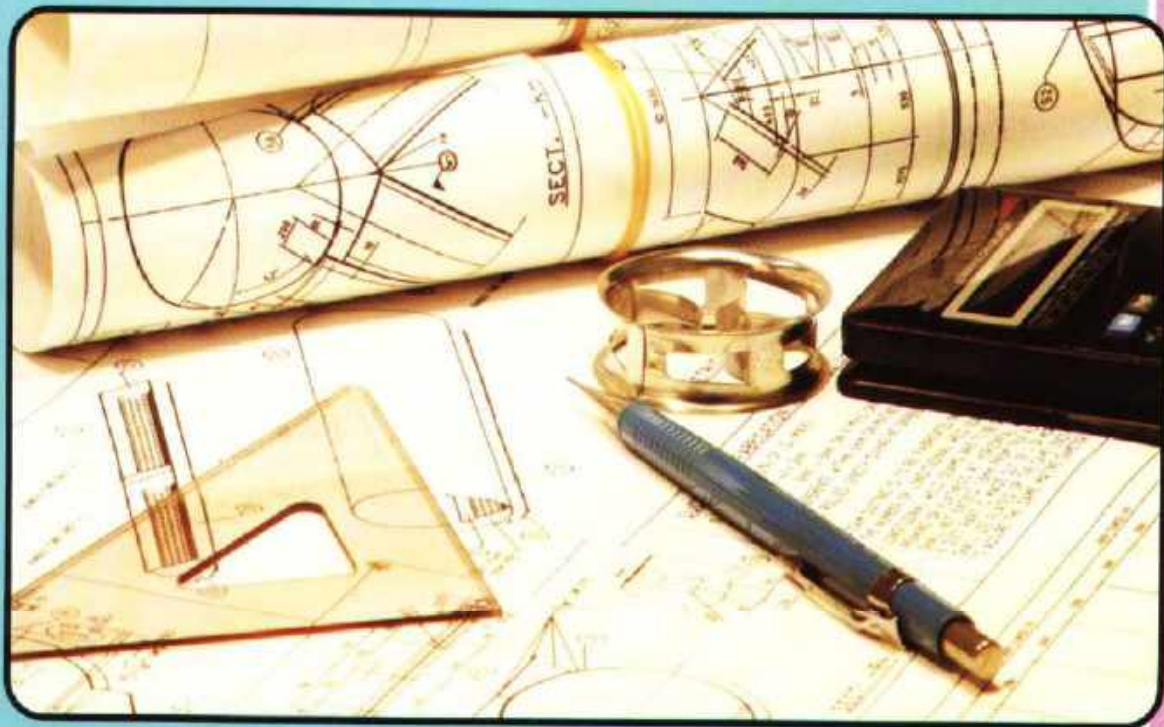


TRADE PRACTICE

2

DRAFTSMAN (MECHANICAL)

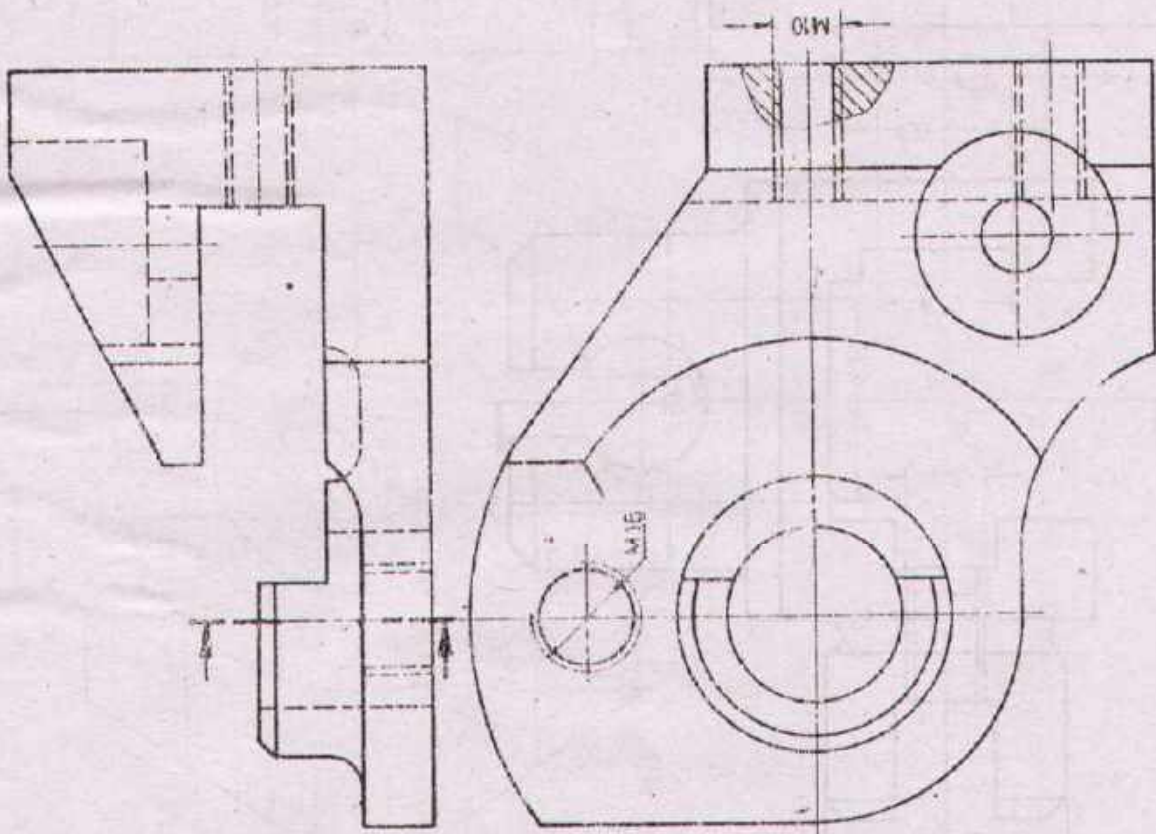


GOVERNMENT OF THE PUNJAB
TECHNICAL EDUCATION & VOCATIONAL TRAINING AUTHORITY
TRADE TESTING BOARD
DEVELOPMENT CELL LAHORE

T.T.P. Series No. 40 Price Rs. 45/-



Task: Draw the side view in sectional representation according to the given section line. Dimensions are not required!



Scale 1:1	STAND	Material GG-18
-----------	--------------	----------------

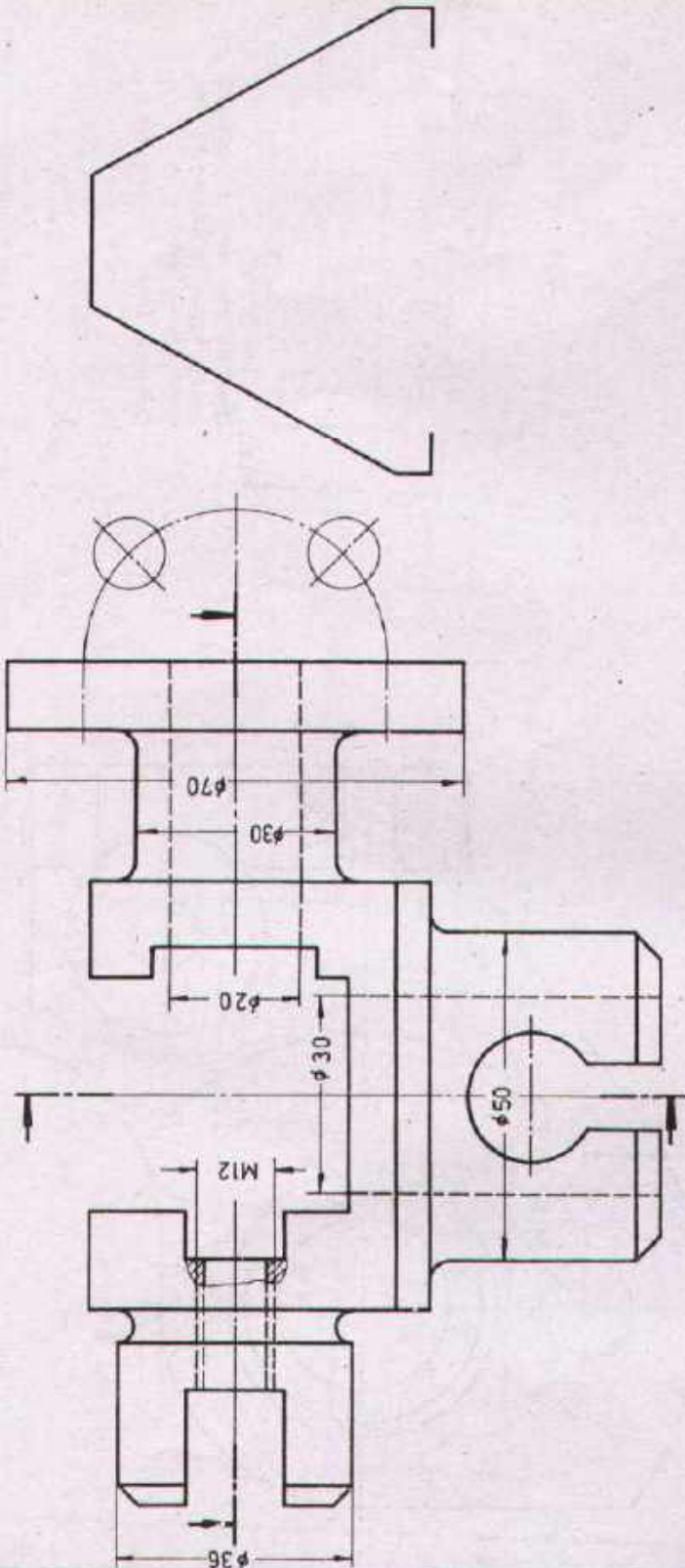
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 1



Task:

Complete the side view and draw the plan view according to the given section lines.
Enter the necessary dimensions!
Sizes are to be taken from the given view!

Scale 1:1	SWINGING ARM		Material C 20
-----------	---------------------	--	---------------

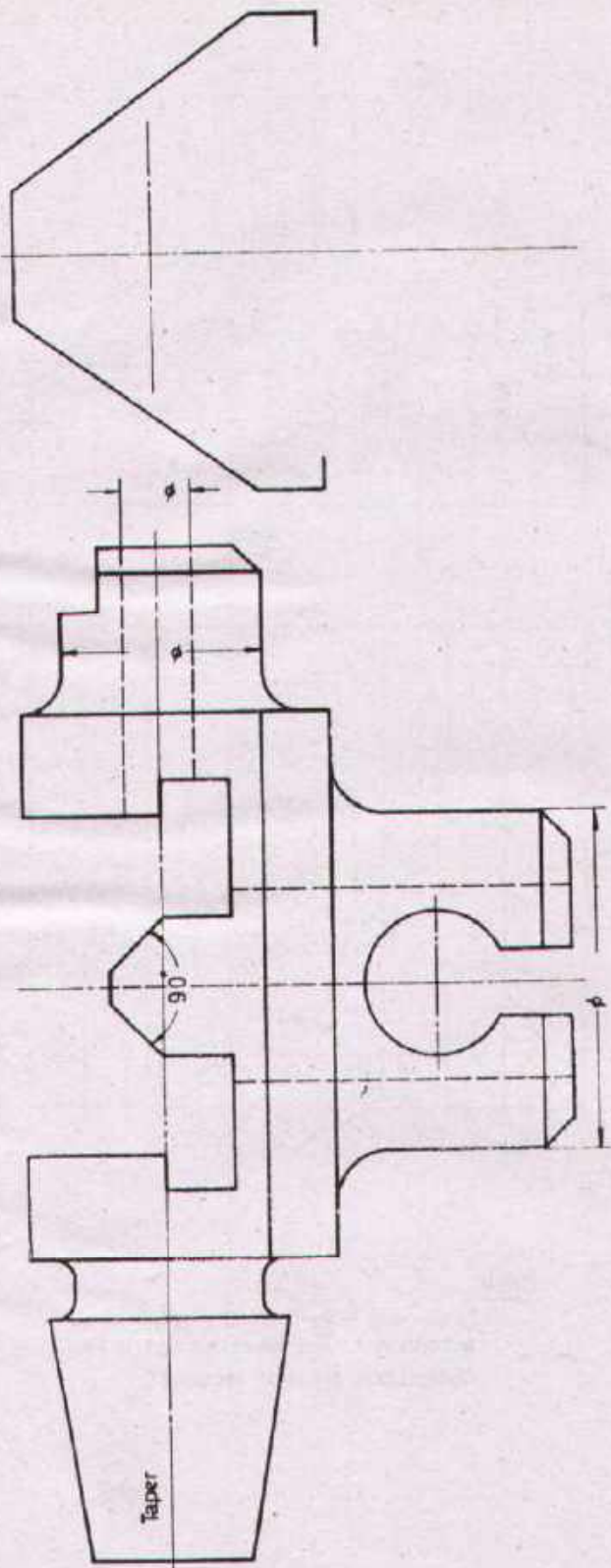
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

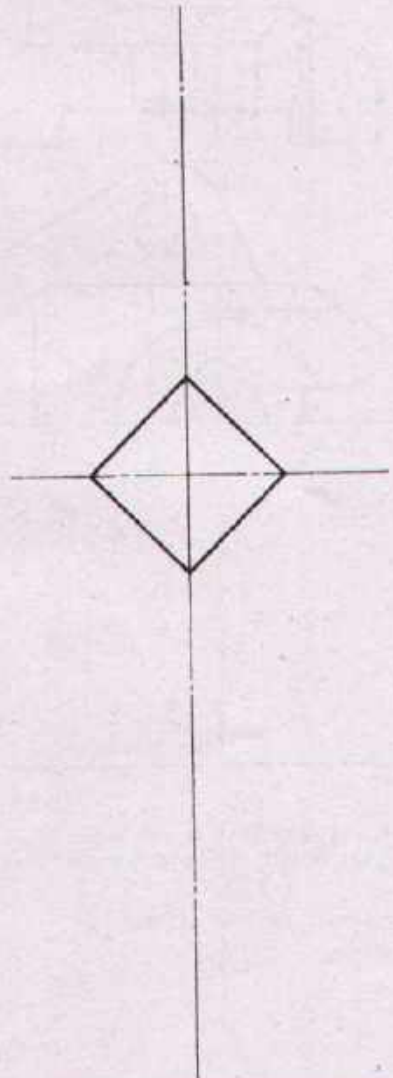
PAK-GERMAN TECHNICAL TRAINING PROGRAMME


Trade Practice **2**
No. 2

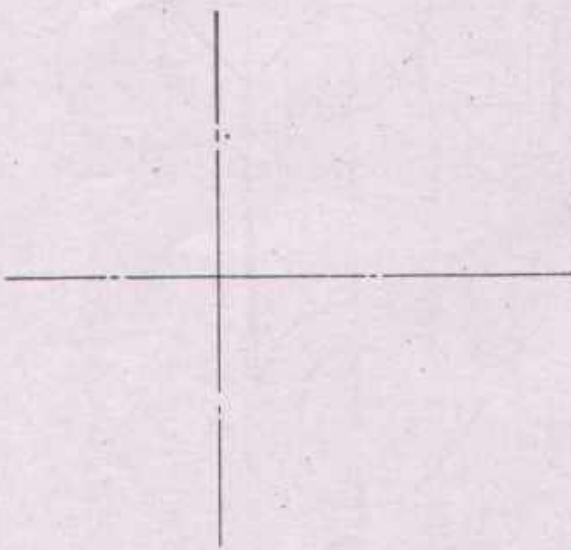
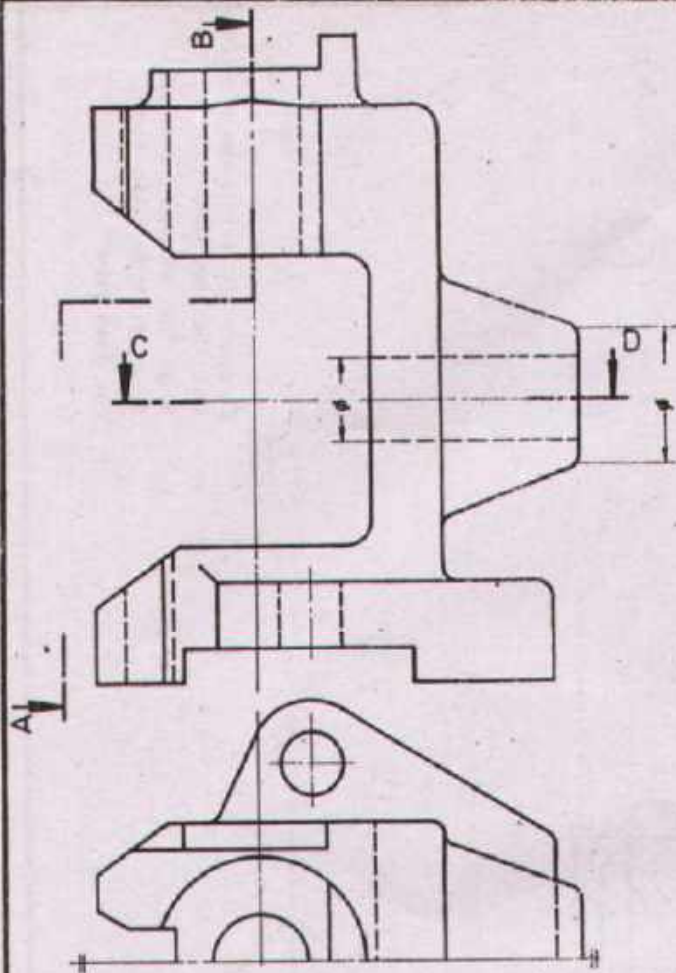


Task:

Complete the side view in section and the plan view.
 Enter the necessary dimensions!
 Sizes are to be taken from the given view!




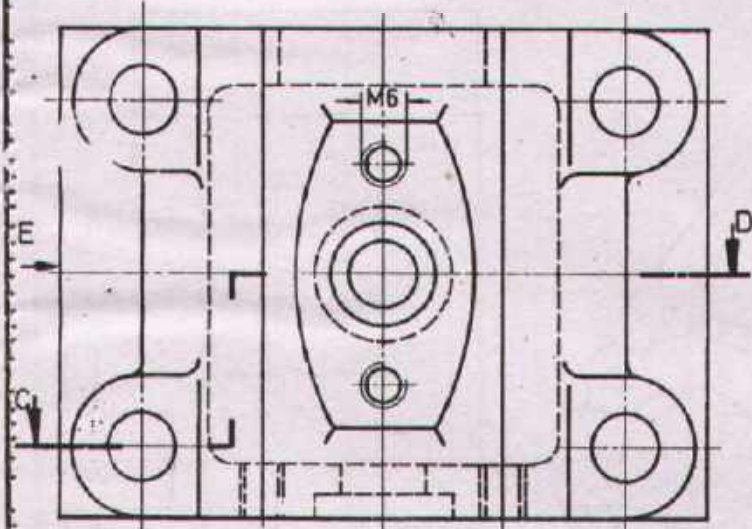
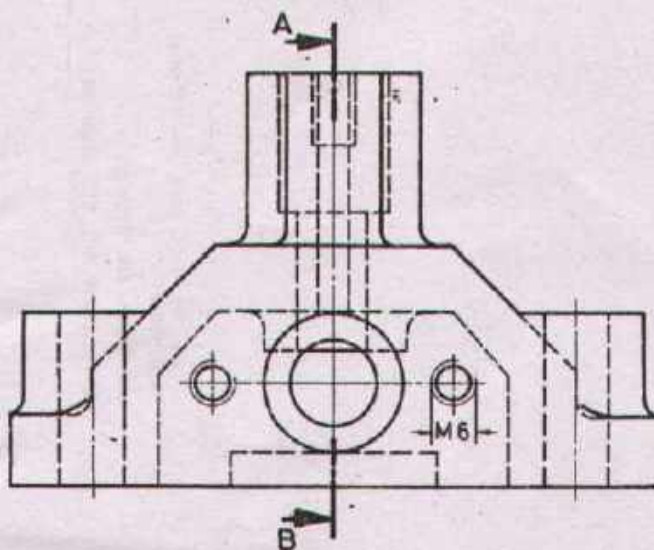
Scale 1:1	SWINGING ARM		Material C 15
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 3



Task:

Draw the side and the plan views according to the given section lines. Dimensions are not required!

Scale 1:1	SUPPORT		Material GTW 35
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 4



View E

Task:

Draw the section A-B, the view as indicated by the arrow „E“ and the section C-D.
Dimensions are not required!

Section C-D

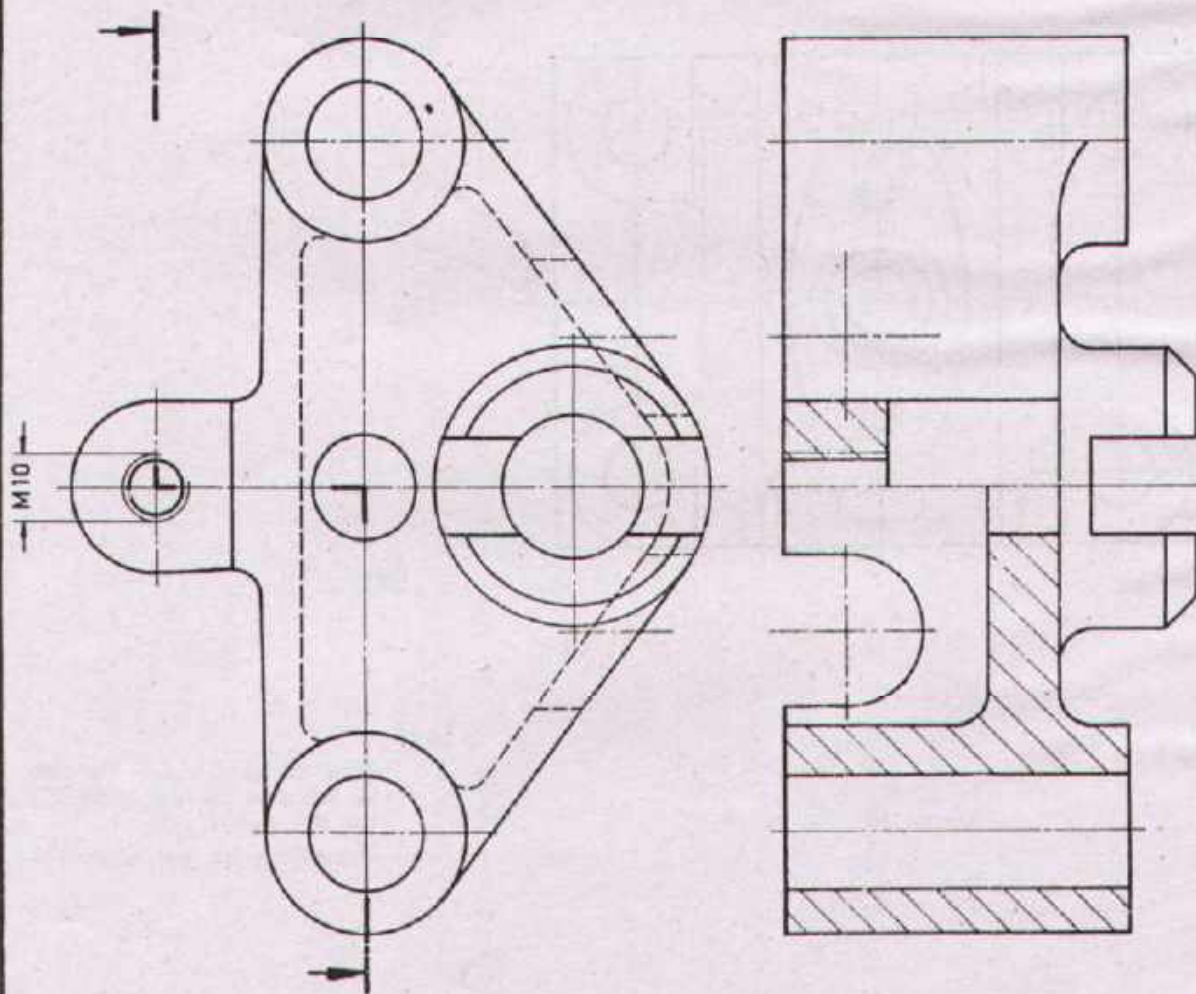
Scale 1:1	SLIDE		Material CuZn 40
Drawn	Name _____ Date _____	Checked	Name _____ Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 5



Task:
 Draw the side view in sectional representation.
 All holes are through!
 Dimensions are not required!

Scale 1:1	BALANCE BEAM	Material GG-15
-----------	---------------------	----------------

Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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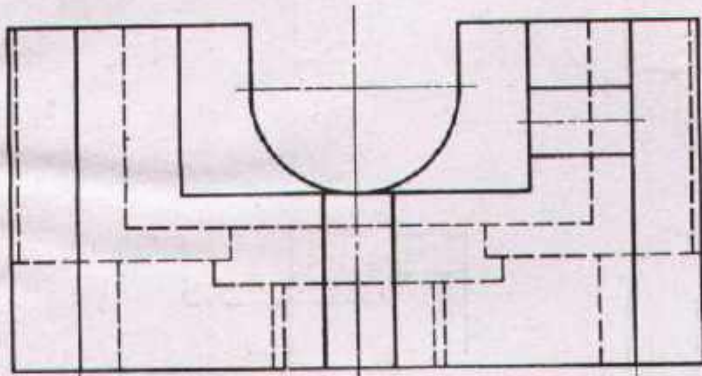


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

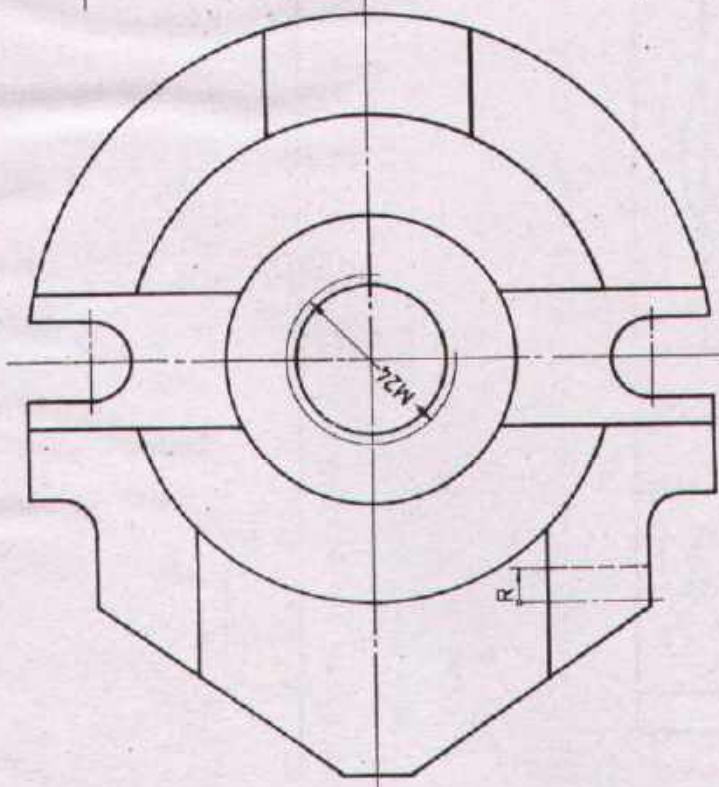
PAX-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No. 6

SIDE VIEW



ELEVATION VIEW



Task

Draw the side view and the plan view in sectional representation. Dimensions are not required!

Scale 1:1	CIRCULAR TABLE		Material 20MnCr5
-----------	-----------------------	--	------------------

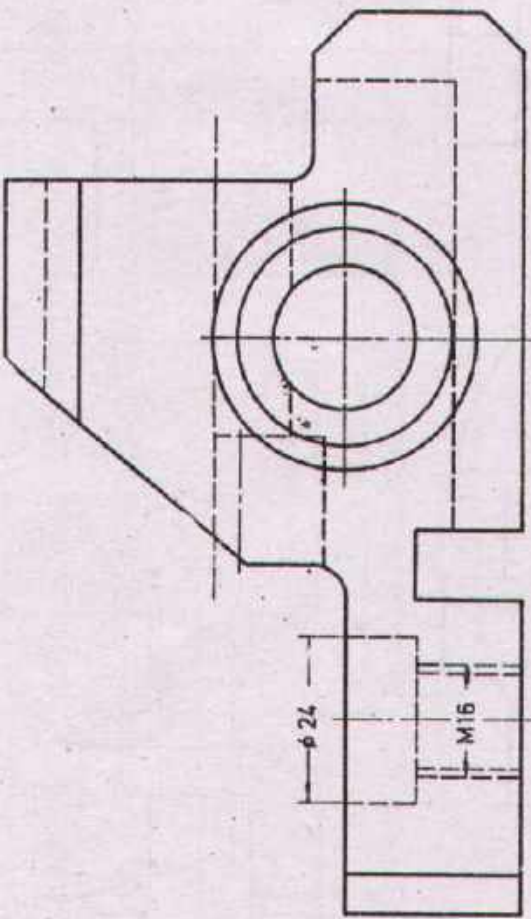
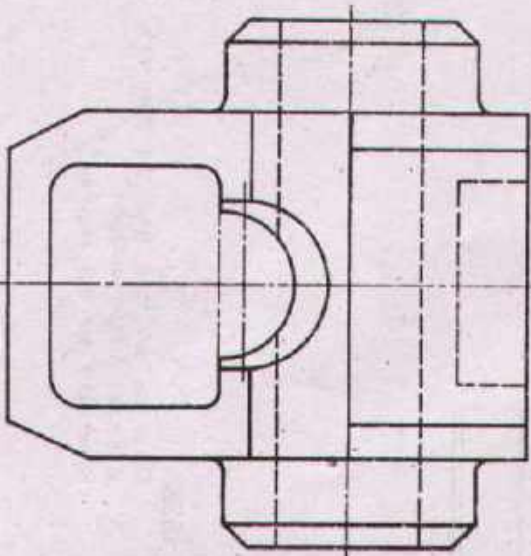
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 7



Task:

Draw the plan view.
Dimensions are not required!

Scale 1:1	STOPPER HAND	Material St.60
-----------	---------------------	----------------

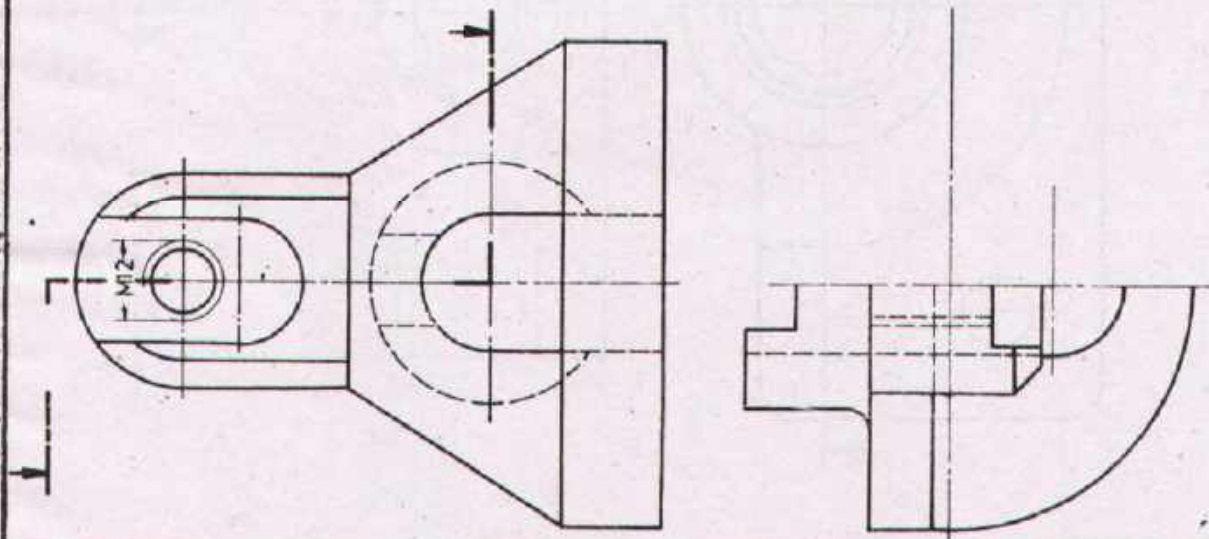
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 8



Task:

- In addition to the given elevation and half of the plan view
1. complete the plan view according to the given section lines.
 2. draw the side view in full section.
 3. draw the side view.
- Dimensions are not required!

ANGULAR SUPPORT

Material St.60

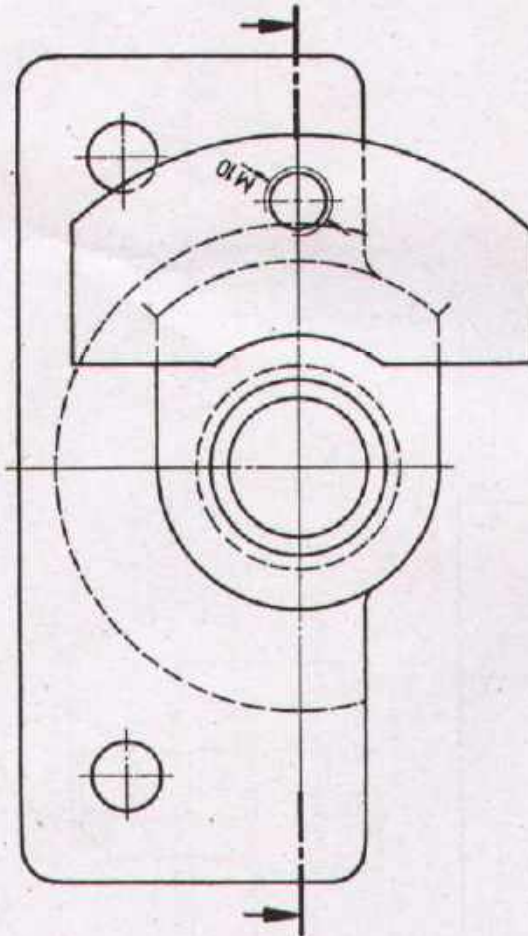
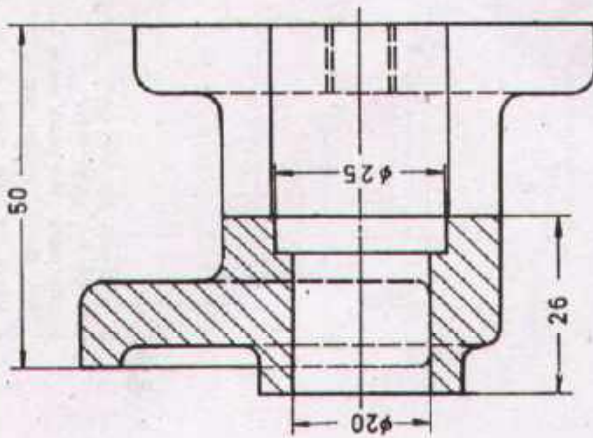
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No.9



Task:

1. Draw the plan view according to the given section line.
 2. Enter the missing dimensions and surface symbols:
 - Surface to $\phi 25$: roughed
 - Surfaces to dimensions '26' and '50': finished
 - Surface to $\phi 20$: fine finished
- All remaining surfaces are neatly cast.
 Sizes are to be taken from the given views!

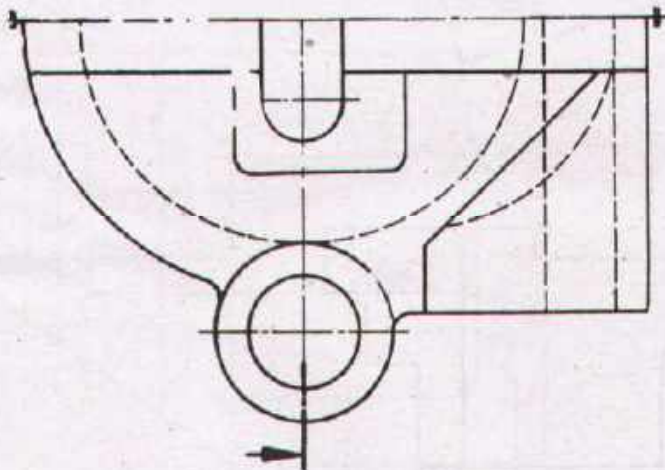
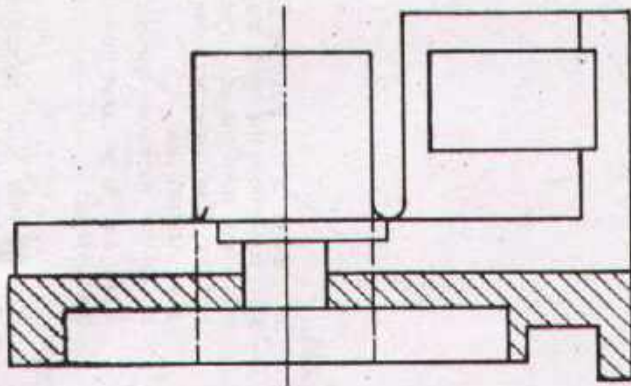
Scale 1:1	LINK		Material GG-18
Drawn	Name _____ Date _____	Checked	Name _____ Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 10



Task:

In addition to the given elevation and sectional side view from the left, draw the side view and the plan view according to the given section line.

Dimensions are not required!

Note:

M7 '16 indicates a through-hole

Sc. 1/1	EYE TYPE BEARING		Material Cu Sn10 Zn
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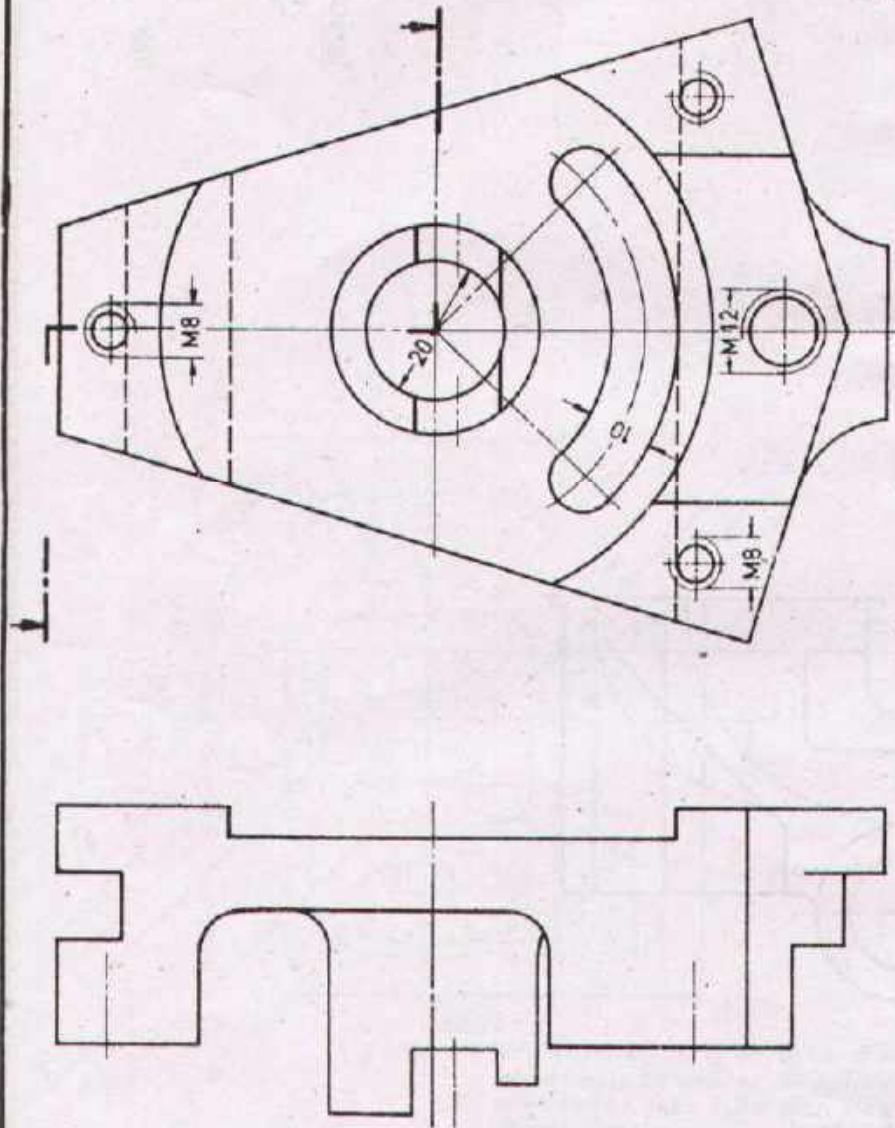
D:	Name _____ Date _____	Checked _____	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No.11



Task:

In addition to the elevation and the side view from the right, draw the side view from the left in section and the plan view according to the given section line.
Enter the necessary dimensions!
Sizes are to be taken from the given views!

Note:

Threaded hole 'M12', hole 'ø20' through, threaded holes 'M8'-10 mm deep

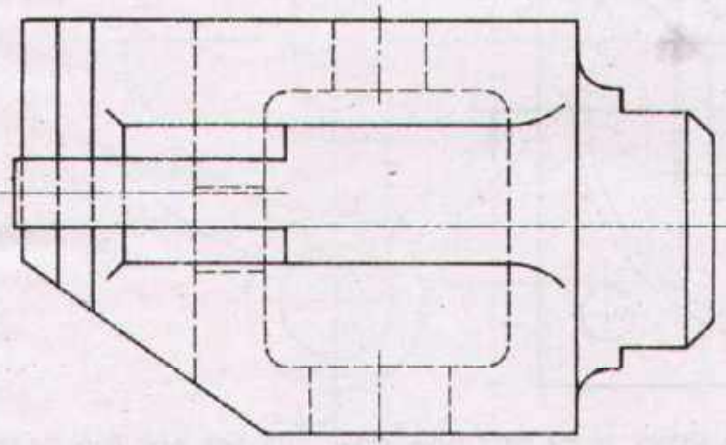
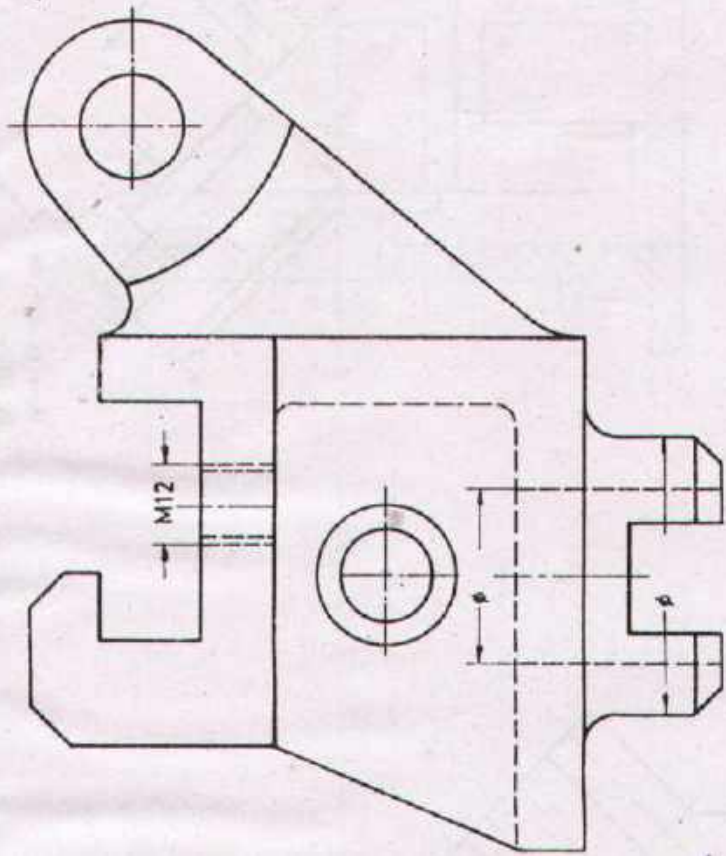
SCALE 1:1	ADJUSTING SUPPORT		Material GG-15
Drawn	Name Date _____	Checked	Name Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 12



Task: ?
 In addition to the given elevation and side view from the right, draw the plan view.
 Dimensions are not required!

Scale 1:1 **SLIDING HEAD BEARING** Material GG-25

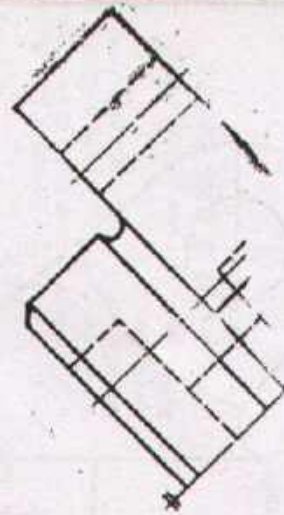
Drawn Name _____ Checked _____ Name _____
 Date Date _____ Date _____



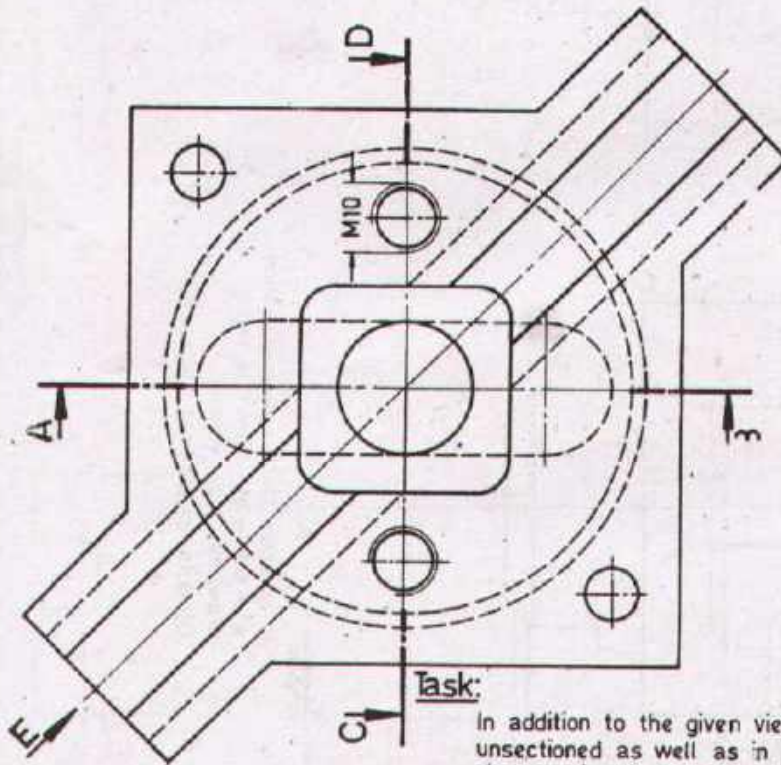
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No 13



View as indicated
by arrow



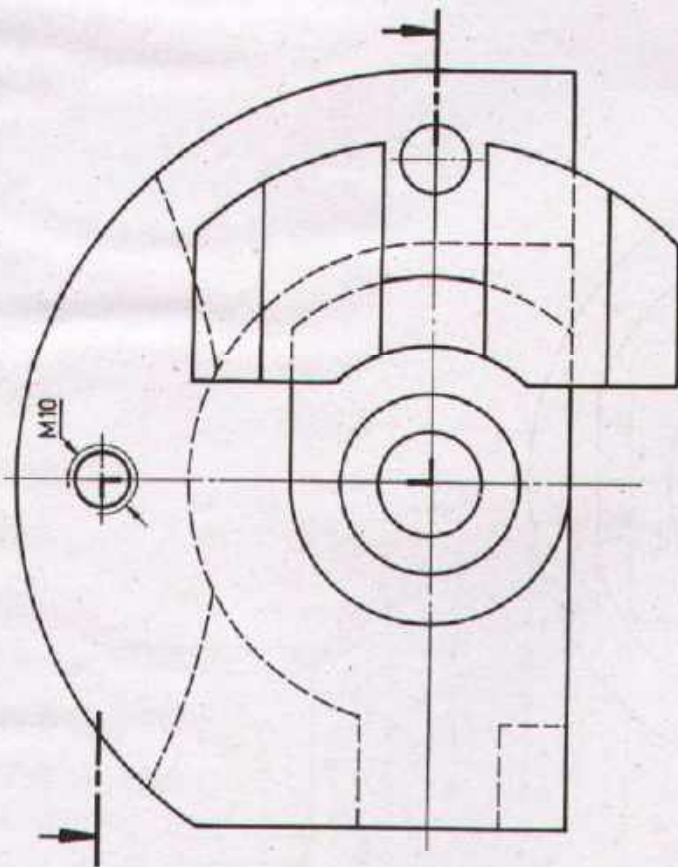
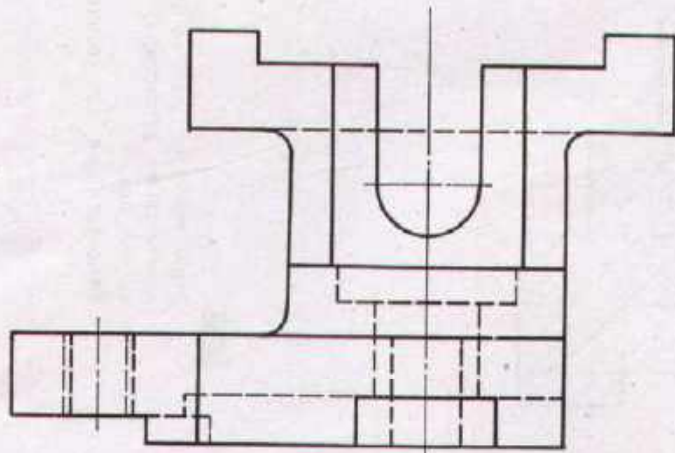
Task:

In addition to the given views draw: 1. The side view from the left unsectioned as well as in sectional representation according to the given section line. 2. The plan view in section according to the given section line. Dimensions are not required!

Scale 1:1	CROSS SLIDE		Material CuZn 20
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Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		Trade Practice 2 No. 14
	PAK-GERMAN TECHNICAL TRAINING PROGRAMME		




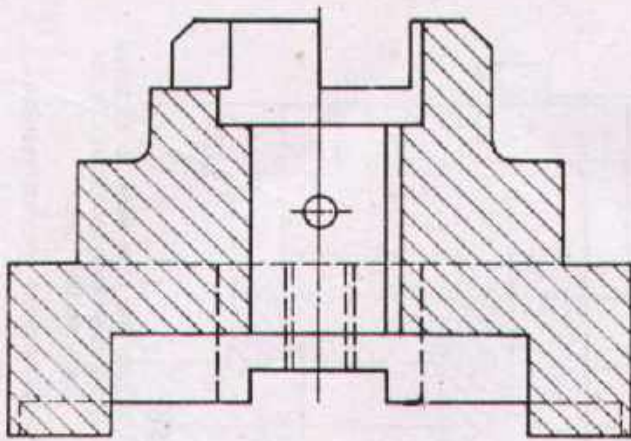
Task:

Draw the plan view in sectional representation according to the given section line.
Dimensions are not required!

Scale 1:1	FIXTURE BASE		Material 34 Cr4
-----------	---------------------	--	-----------------

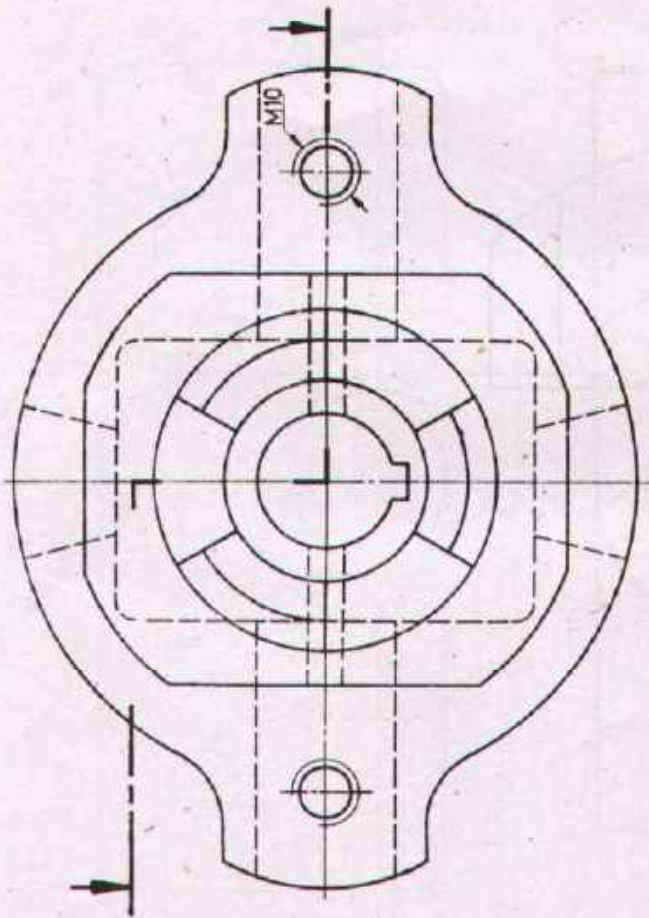
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		Trade Practice 2 No. 15
	PAK-GERMAN TECHNICAL TRAINING PROGRAMME		



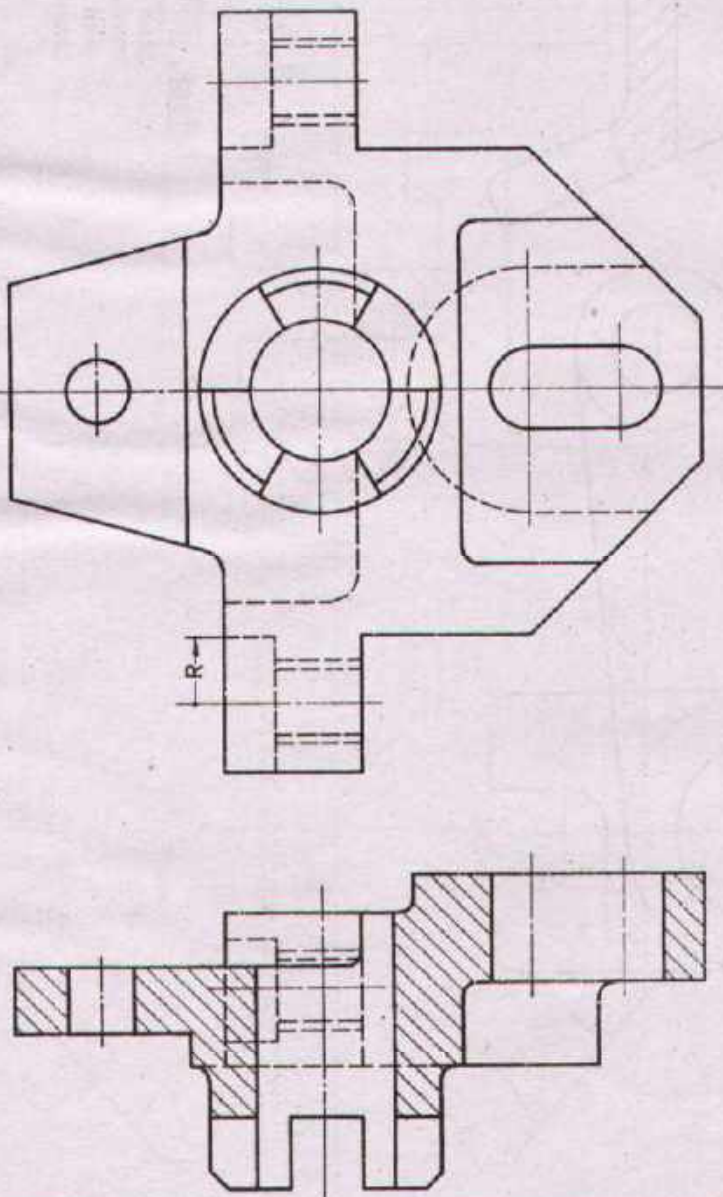
Task:

Draw the plan view in sectional representation according to the given section line.
Dimensions are not required!



Scale 1:1	CLUTCH HALF	Material 34 Cr 4
-----------	--------------------	------------------

Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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Task

Draw the side view from left and the plan view.
Dimensions are not required!

Note

Threads: M12

Scale 1:1	CARRIER	Material St.50
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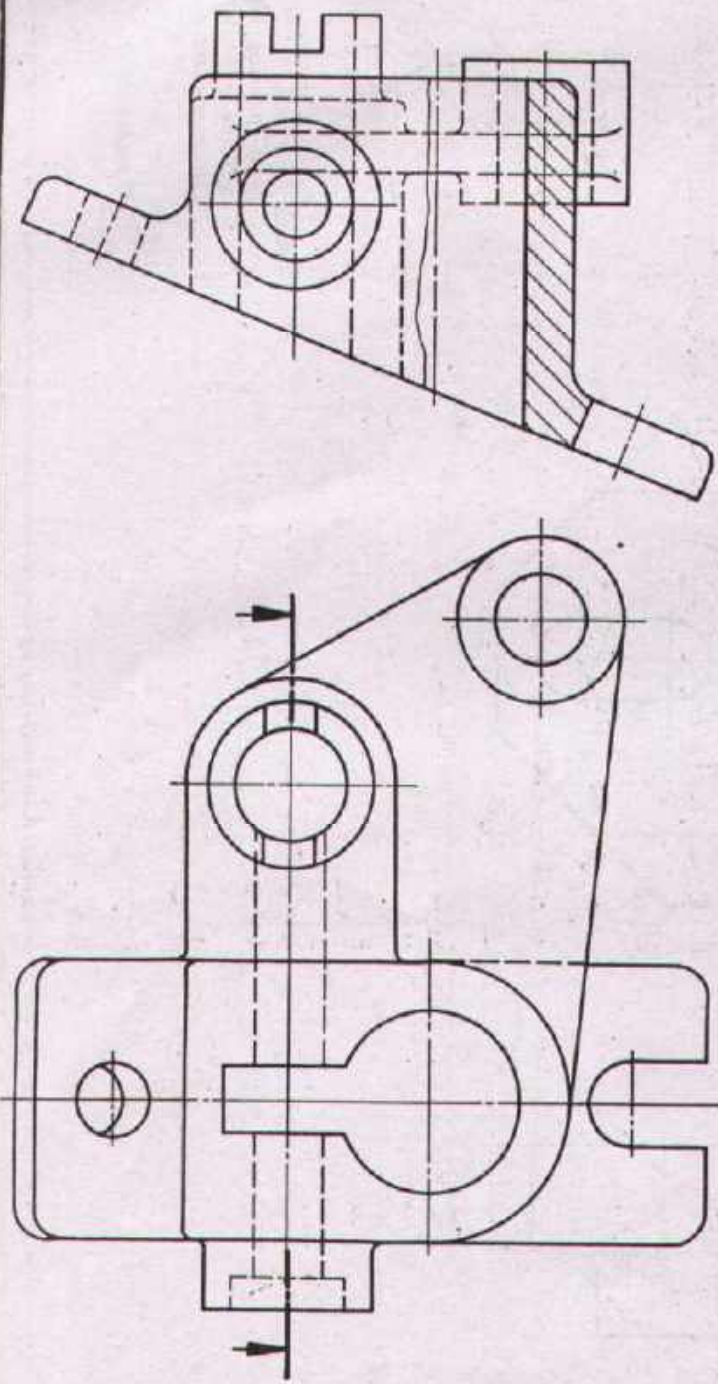
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No.17



Task:

Draw the plan view in sectional representation according to the given section line. Dimensions are not required!

Scale 1:1	DEVIATING SUPPORT	Material Cu Zn 37
-----------	--------------------------	-------------------

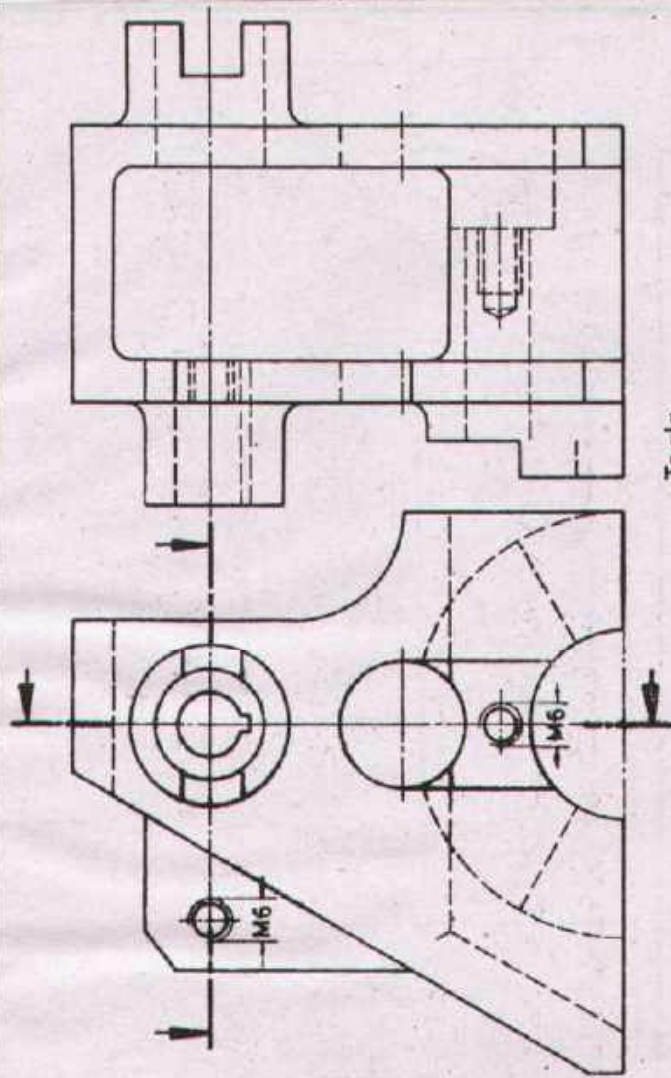
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No.18



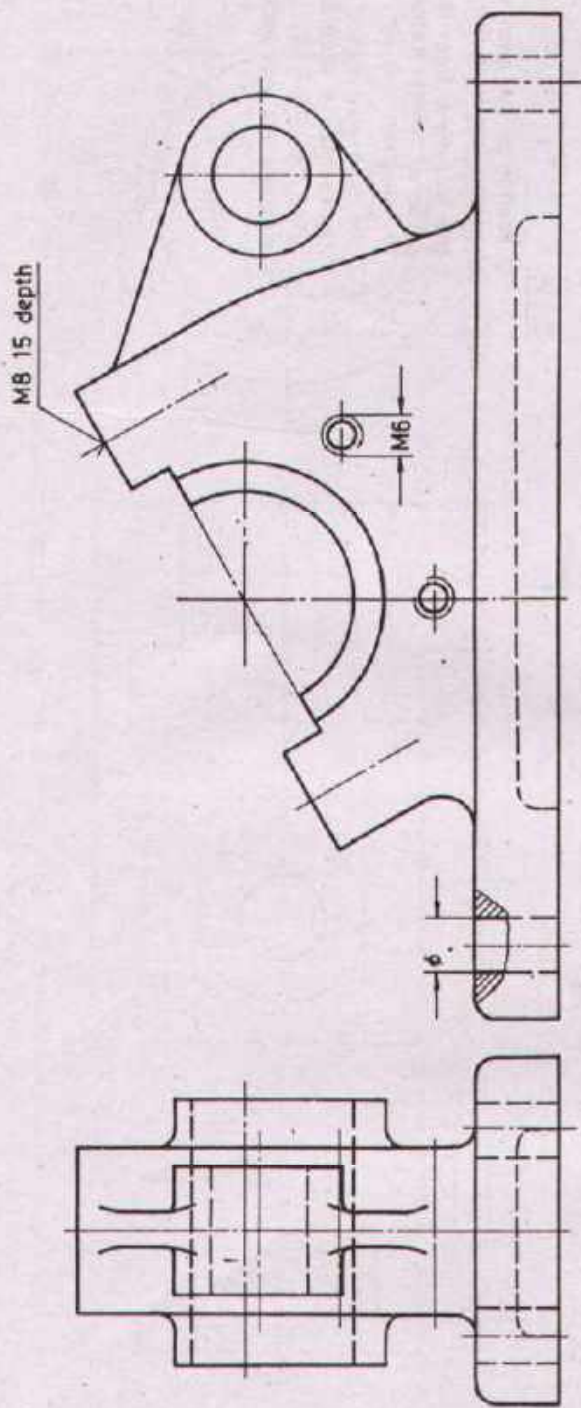
Task

- In addition to the given elevation and side view from the left draw:
1. the side view from the right in sectional representation according to the given section line.
 2. the plan view in sectional representation according to the given section line.
- Dimensions are not required!

Scale 1:1	BEARING SUPPORT		Material GG-25
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Drawn	Name Date	Checked	Name Date
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	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING	Trade Practice 2 No.19
	PAK GERMAN TECHNICAL TRAINING PROGRAMME	



Task:

In addition to the given elevation and the side view from the right draw the plan view.

Dimensions are not required!

Note

The corners of the base plate have a radius (R=10)

Scale 1:1	CROSS BEARING		Material GG-18
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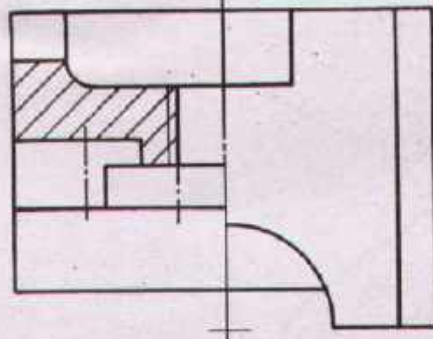
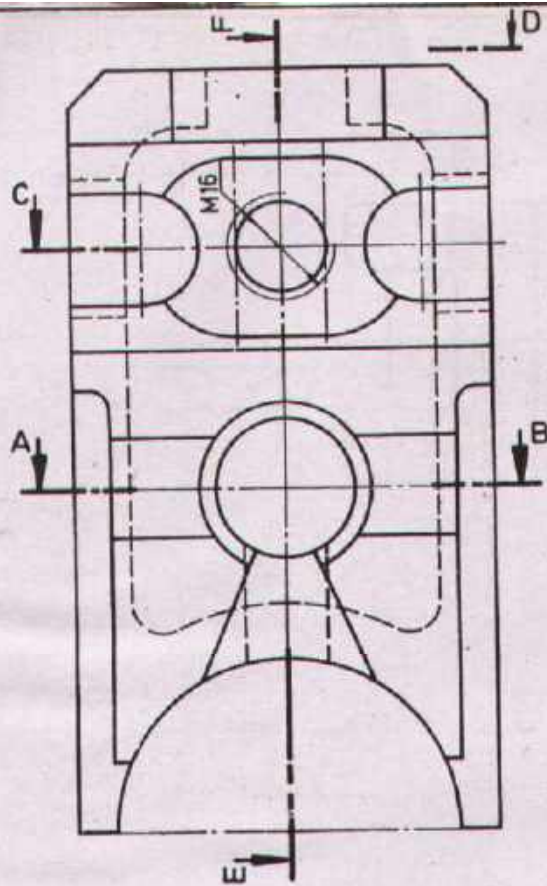
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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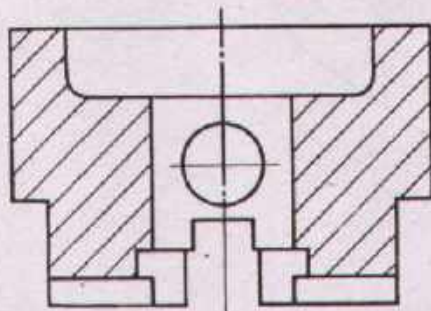
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 20




Section C-D

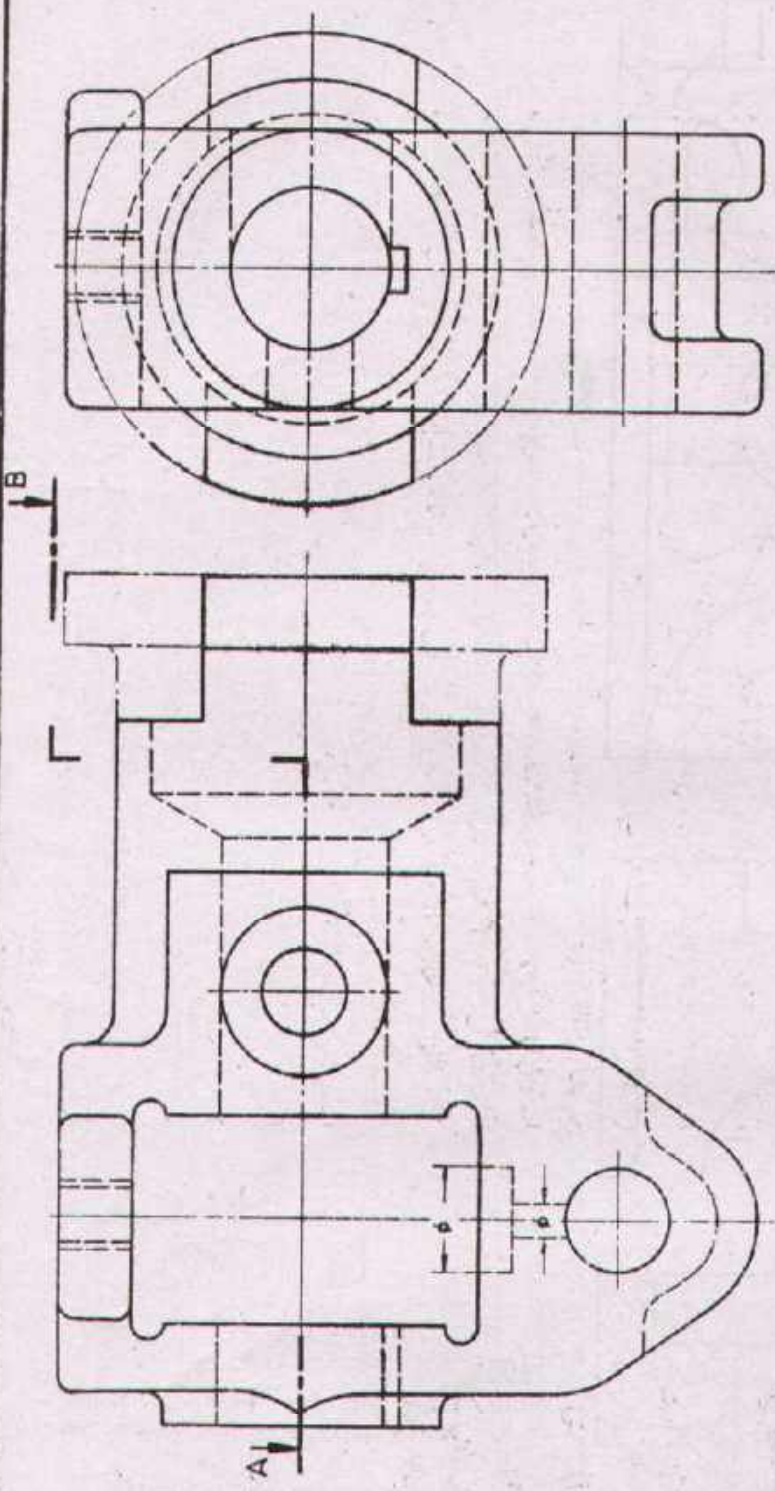


Section A-B


Task:

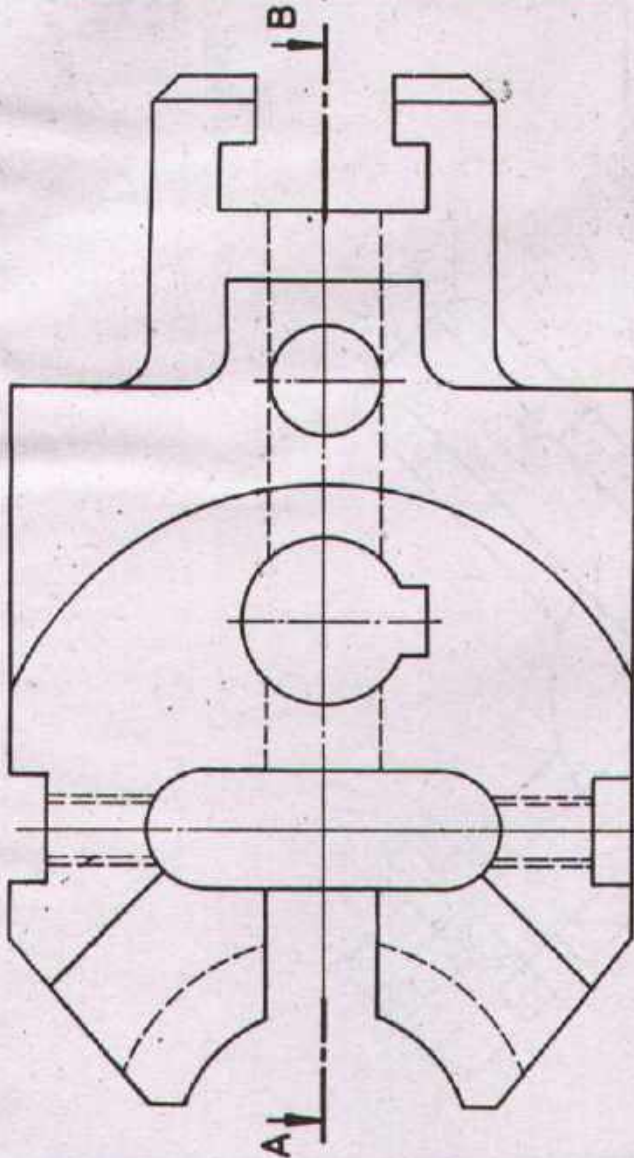
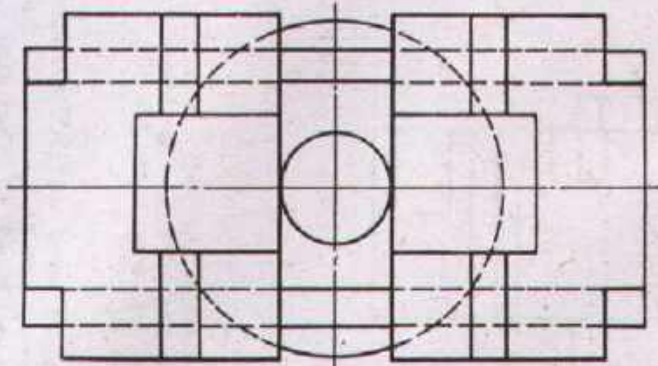
Draw the side view in sectional representation according to the given section line.
Dimensions are not required!

Scale 1:1	FLAT SLIDE		Material CuZn 14
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 21



Task:
 Draw the section A-B
 Dimensions are not required!

Scale 1:1	CONTROL SLIDE		Material GG-20
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING <small>VAK-GERMAN TECHNICAL TRAINING PROGRAMME</small>			Trade Practice 2 No. 22



Task:

Draw the section A-B
Dimensions are not required!

Note

Thread: M 10

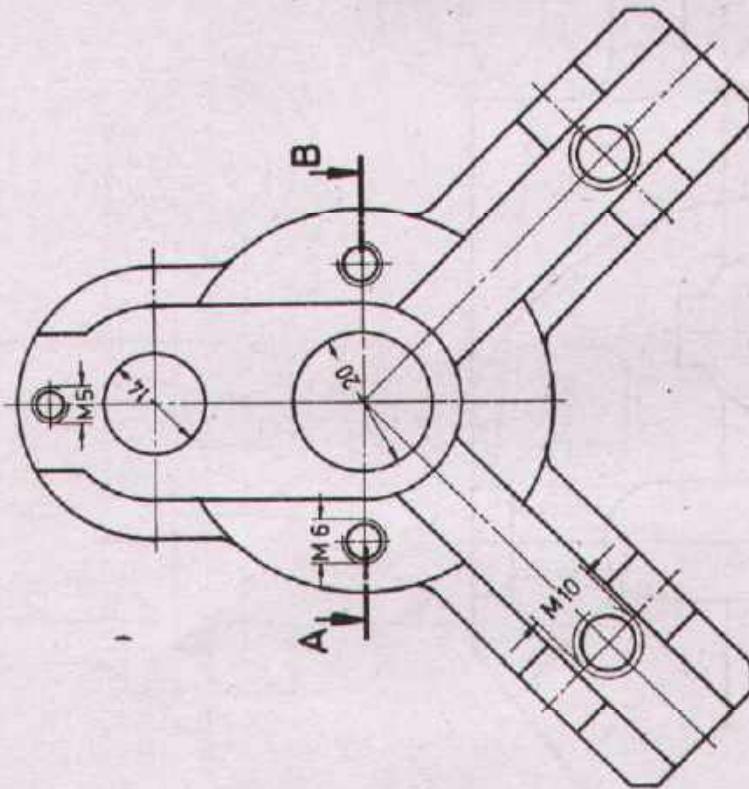
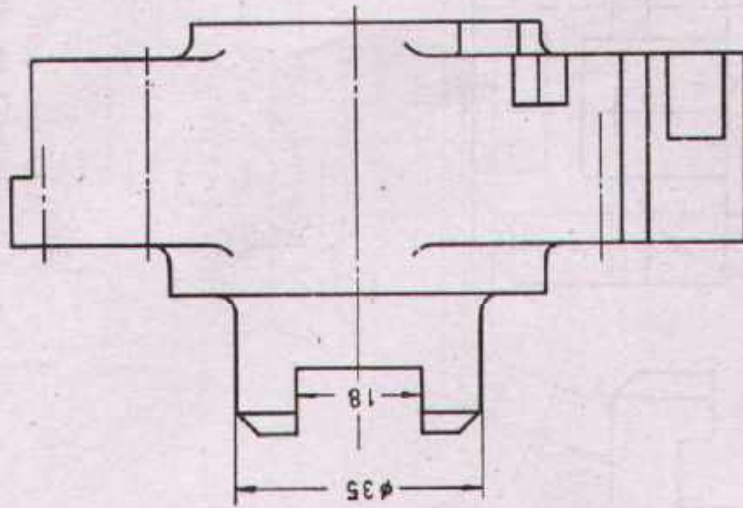
Scale 1:1	CLAMPING JAW		Material St. 70
Drawn	Name _____ Date _____	Checked	Name _____ Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 23



Task:

Draw the section A-B
Enter the necessary dimensions!
Sizes are to be taken from the
given view!

Note

Threaded holes 'M 5', 'M 10' and holes 'φ 20'
and 'φ 14' through
Threaded hole 'M 6': 15 mm deep.

Scale 1:1 **SWINGING ARM** Material GG-20

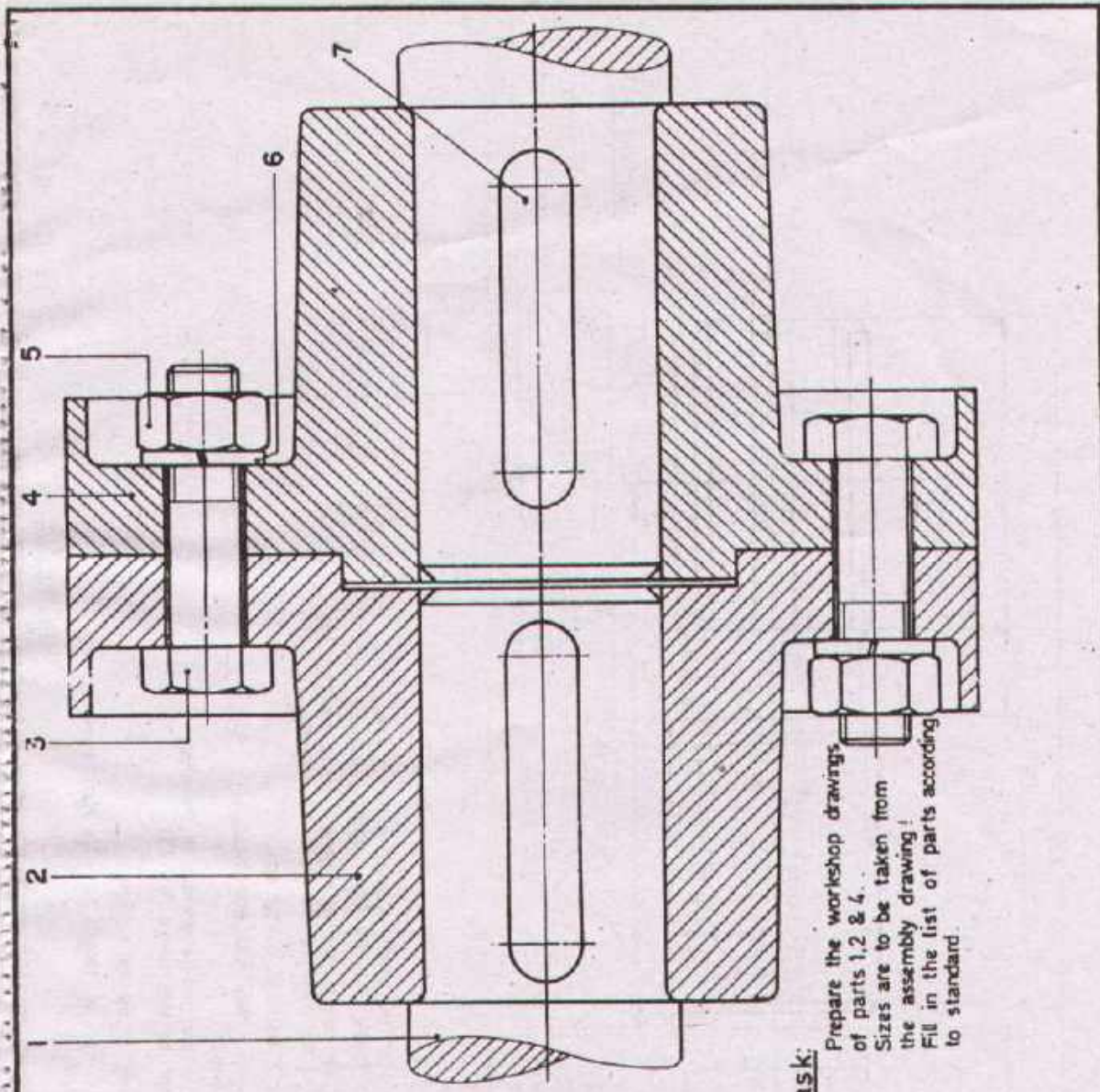
Drawn Name _____ Date _____ Checked _____ Name _____ Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 24



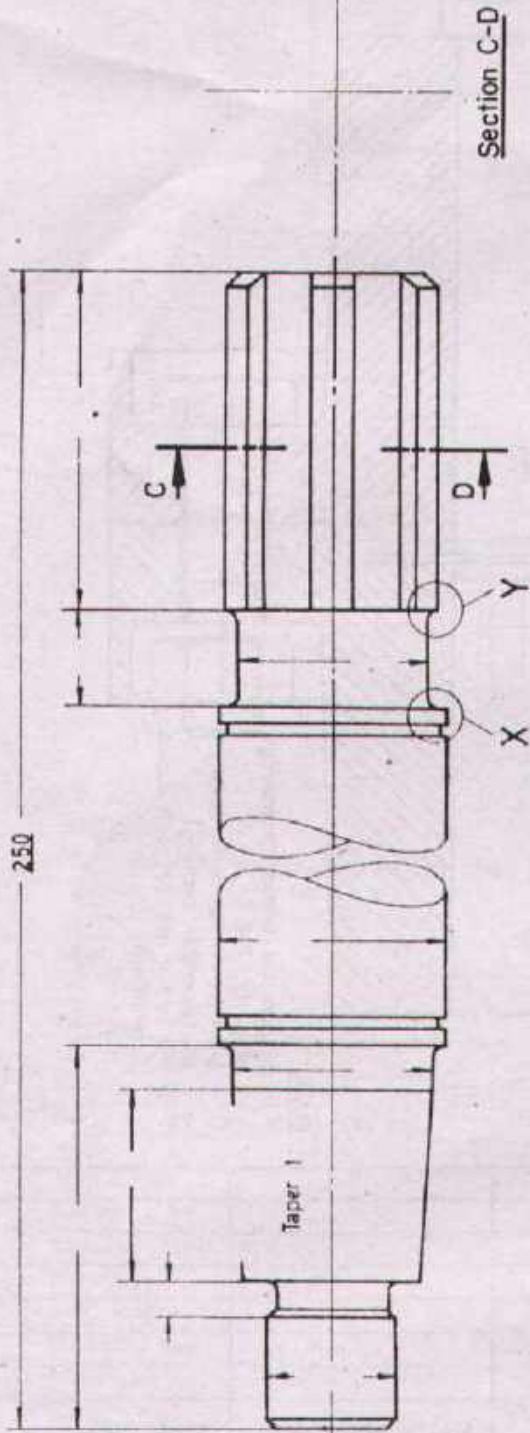
Task:
 Prepare the workshop drawings
 of parts 1, 2 & 4.
 Sizes are to be taken from
 the assembly drawing!
 Fit in the list of parts according
 to standard.

No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
----------	-------------	----------	----------	----------

Scale 1:1 **SAFETY FLANGE COUPLING**

Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		Trade Practice 2 No. 25
	PAK-GERMAN TECHNICAL TRAINING PROGRAMME		




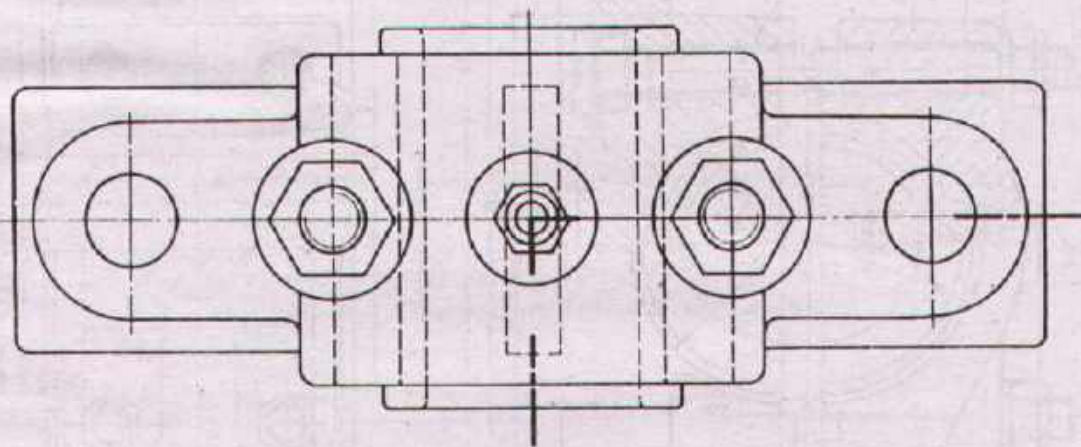
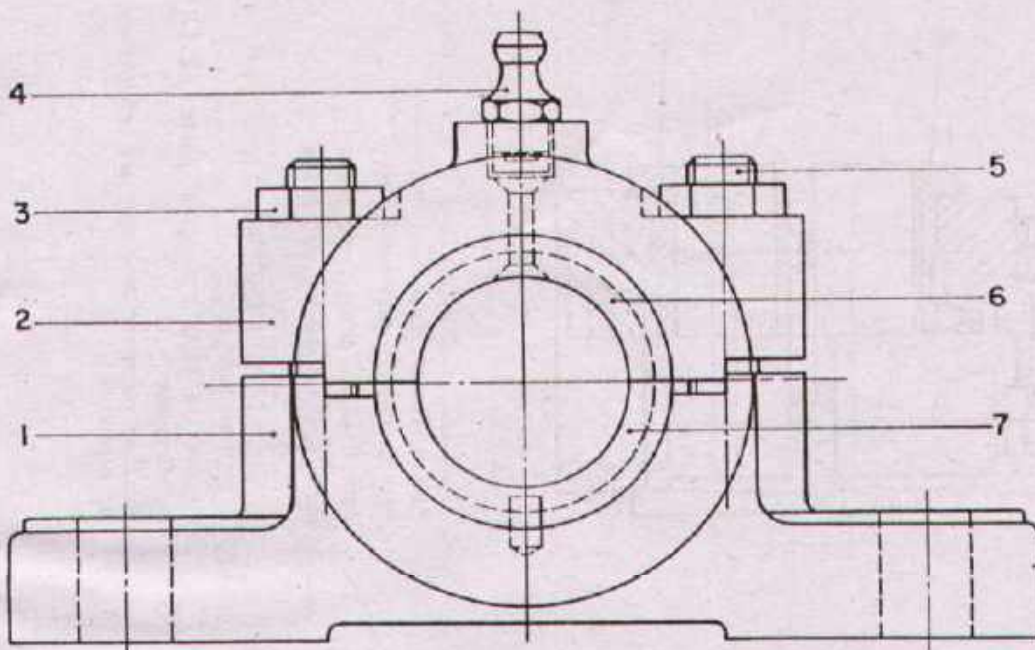
Task:

- 1 The left hand end of the shaft is given a metric fine thread, M20 x 1.5 mark the portion accordingly
 - 2 In the middle of the conical portion a keyway for a woodruff key (acc to standard) is to be provided, complete the drawing.
 - 3 Draw the details X and Y in double size
 - 4 The spline shaft profile has the specification B 6x28x32 DIN 5462
 - 5 The two grooves in the middle portion of the shaft ϕ 35 mm are meant for lock rings DIN 471.
- Complete the drawing of the spline shaft.
The necessary sizes can be taken from the Hand book for Draftsman/Mech.

Detail at Y
Scale

Detail at X
Scale

Scale 1:1	SPLINE SHAFT		Material C 15
Drawn	Name Date	Checked	Name Date
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 26




Task

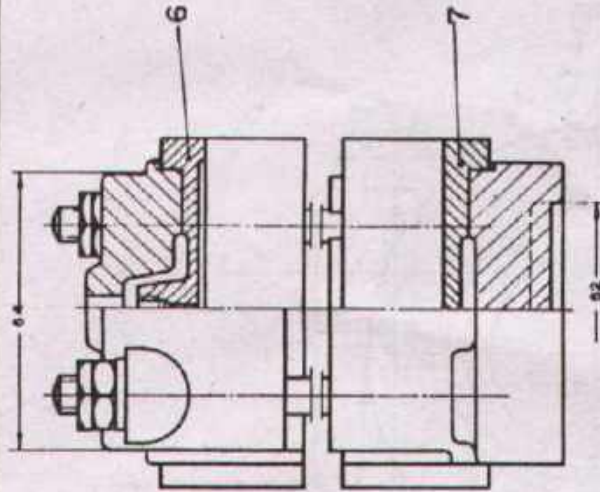
Prepare the assembly drawing (elevation view in half sectional representation as indicated by the section line) and the list of parts.

Prepare detail drawings of all parts (except standard parts)

Enter the necessary dimensions!

Sizes are to be taken from the assembly drawing!

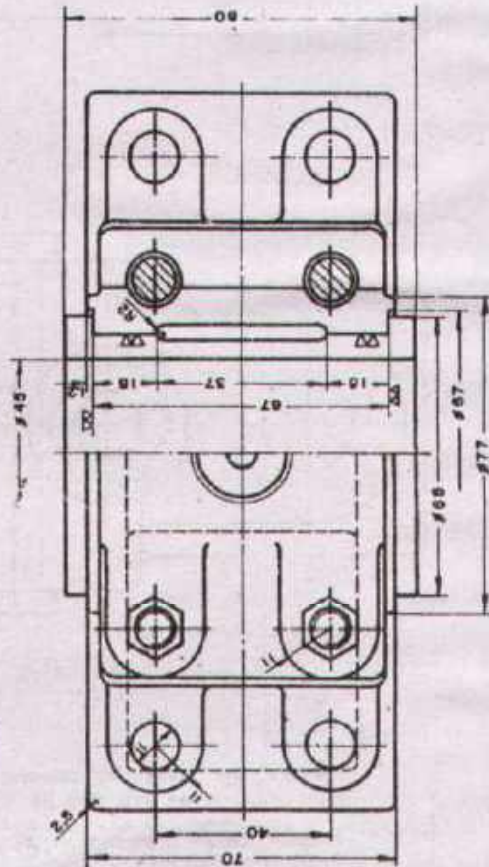
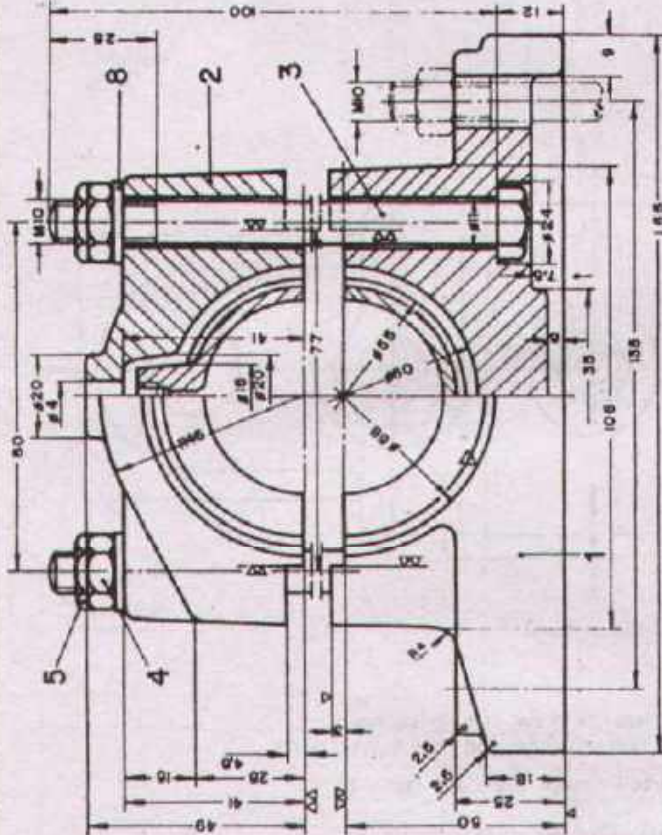
Scale	PLUMMER BLOCK		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 27




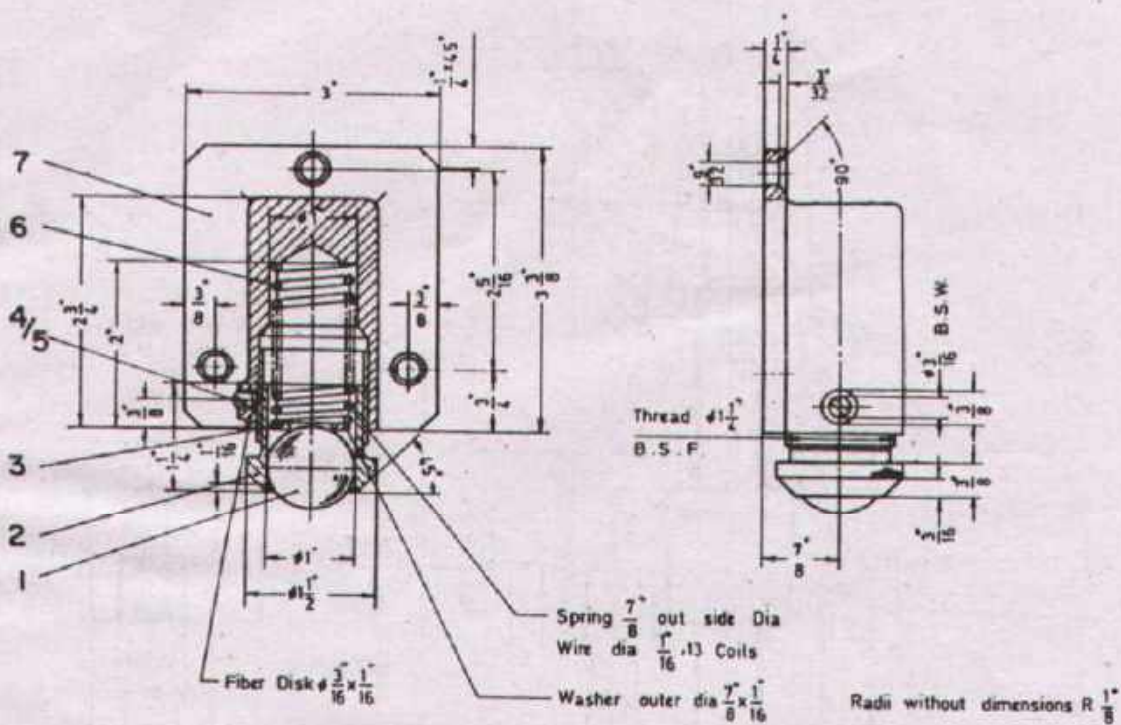
- Part 1 Base, cast iron
- Part 2 Cover, cast iron
- Part 6 Upper pillow, red brass
- Part 7 Lower pillow, red brass

Task:

Prepare the detail drawings of parts (1,2,6,7) in full scale. Enter all necessary dimensions and information for production.



Scale	PLUMMER BLOCK		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		Trade Practice 2 No. 28
PAK-GERMAN TECHNICAL TRAINING PROGRAMME			



Task:

1. Describe the function of the given „DOOR CATCH“

2. Draw the detail drawings of parts 1, 2 & 3 in full scale.

3. Fill in the part list of parts along with all specifications

Enter the necessary dimensions!

Note

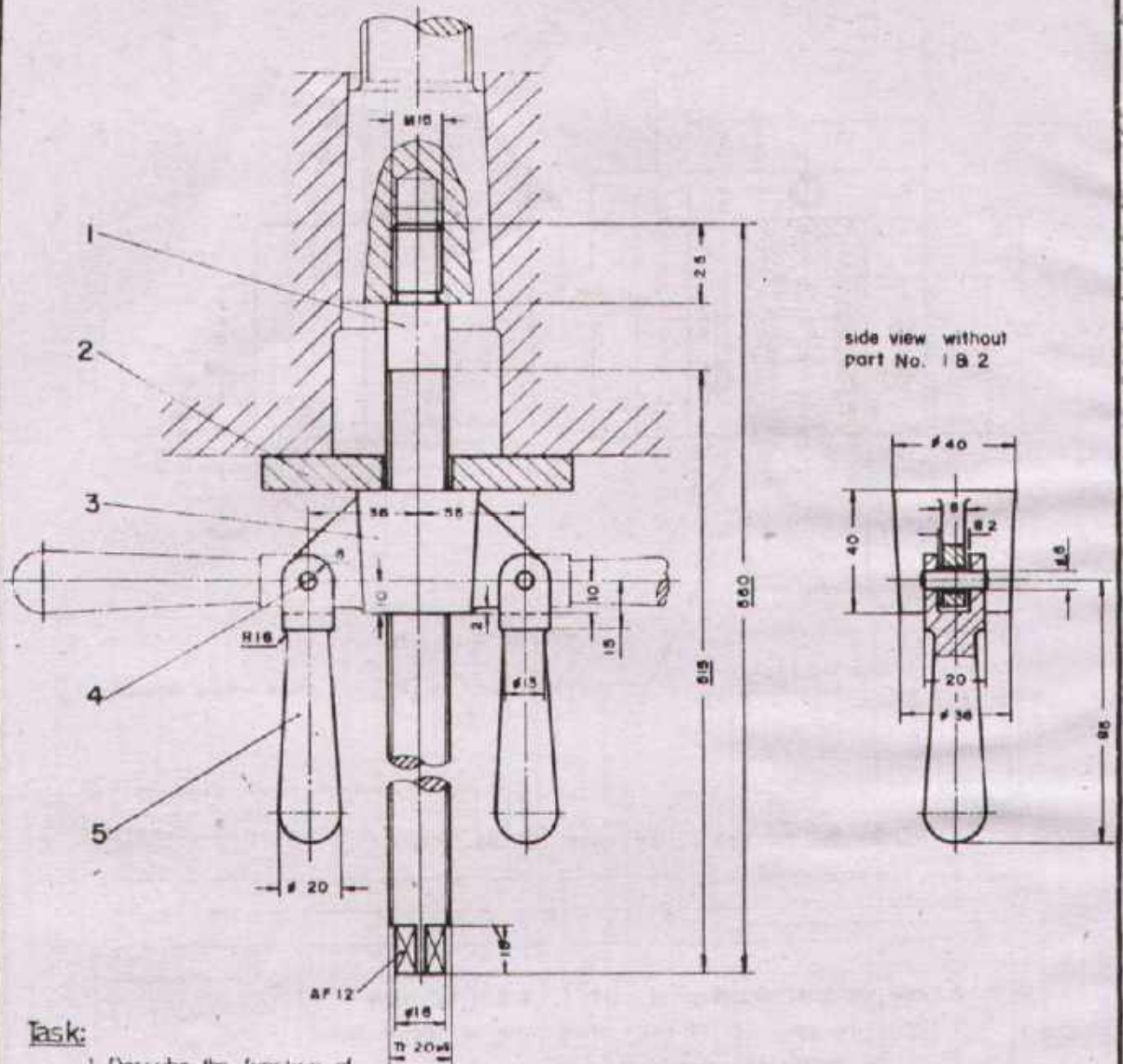
Mind that the scale used is according to British standard.

No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
----------	-------------	----------	----------	----------

Scale 1:2	DOOR CATCH			
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Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		Trade Practice 2 Nn 29
	PAK-GERMAN TECHNICAL TRAINING PROGRAMME		



Task:

1 Describe the function of the given device.

2. Prepare the workshop drawings of parts 1,2,3&5.

3. Fill in the list of parts acc. to standard.

No REQD	DESCRIPTION	PART No	MATERIAL	STANDARD

Scale 1:2

DISMANTLING DEVICE

Drawn

Name _____
Date _____

Checked

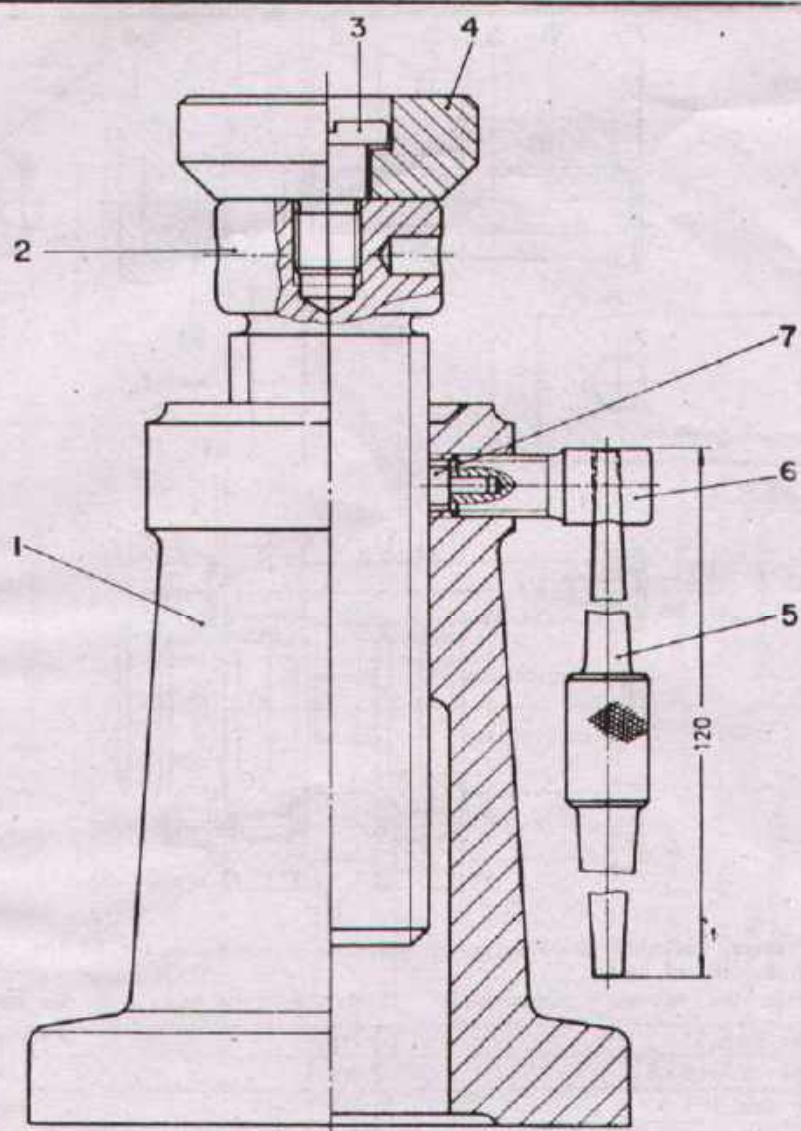
Name _____
Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 30



Task:

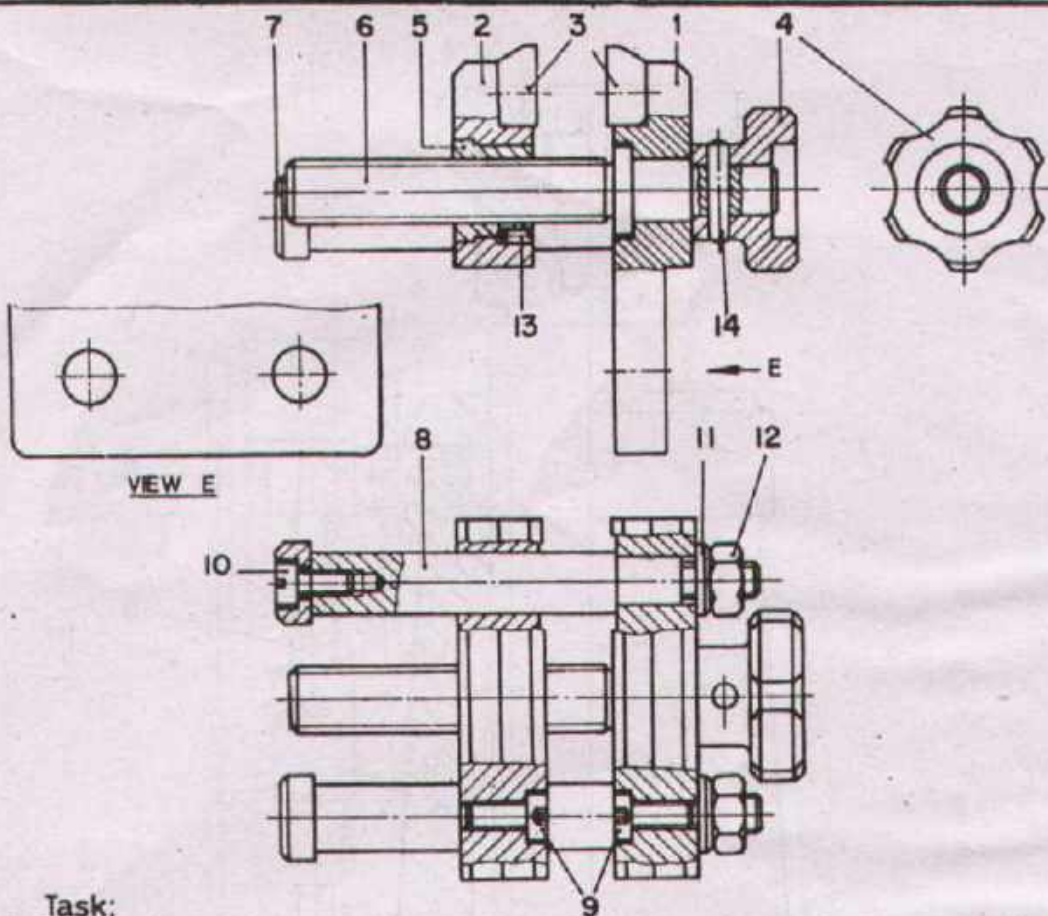
1. Change the design of the Screw Jack in such a way that parts 5,6 and 7 are replaced by a knurled locking nut.
2. Fill in the list of parts acc to standard.
3. Prepare detail drawing of each part.
(The necessary sizes should be taken from the assembly drawing.)

No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
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Scale 1:1 **SCREW JACK**

Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME	Trade Practice 2 No 31
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Task:

Prepare workshop drawings of all parts (except standard parts), fill the column of material in the list of parts. Enter the necessary dimensions! Sizes are to be taken from the assembly drawings!

1	Taper pin ϕ 3mm	14		DIN 1
1	Set screw M 3x5	13		DIN 553
2	Hexagon nut M 6	12		DIN 934
2	Bright washer ϕ 12 x 1,5	11		DIN 125
2	Cheese head screw M4x8	10		DIN 84
4	Socket head cap screw M4x10	9		DIN 912
2	Rod	8		
2	Stop	7		
1	Spindle M 10	6		
1	Threaded bush M10	5		
1	Handle	4		
2	Jaw inserts	3		
1	Moveable jaw	2		
1	Fixed jaw	1		

No. REQD.	DESCRIPTION	PART No.	MATERIAL	STANDARD
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Scale 1:1

PARALLEL VICE

Drawn

Name _____
Date _____

Checked

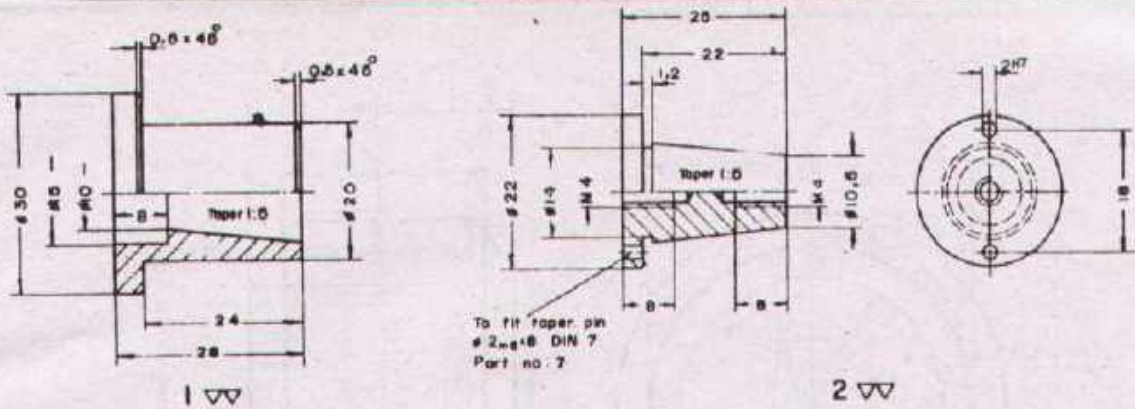
Name _____
Date _____



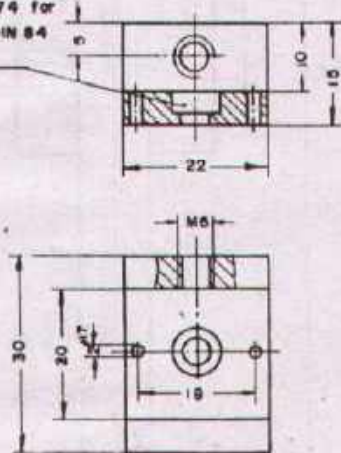
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No.32



C/bore type H acc. to DIN 74 for Cheese head screw M4x8 DIN 84 Part no. 6



Task:

Prepare the assembly drawing of "CLAMP CONNECTION" in double scale in the following views.
 a Half sectional elevation view.
 b Side view.

2	Taper pin # 2 _{mm} x 8	7	St. 50	DIN 7
2	Cheese head screw	6	4.6	DIN 84
1	Washer	5	St. 37	DIN 125
1	Knurled screw	4	Brass	
1	Frame	3	St. 37	
1	Cone	2	Brass	
1	Taper sleeve	1	St. 37	

No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
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Scale 1	DETAILS OF CLAMP CONNECTION		
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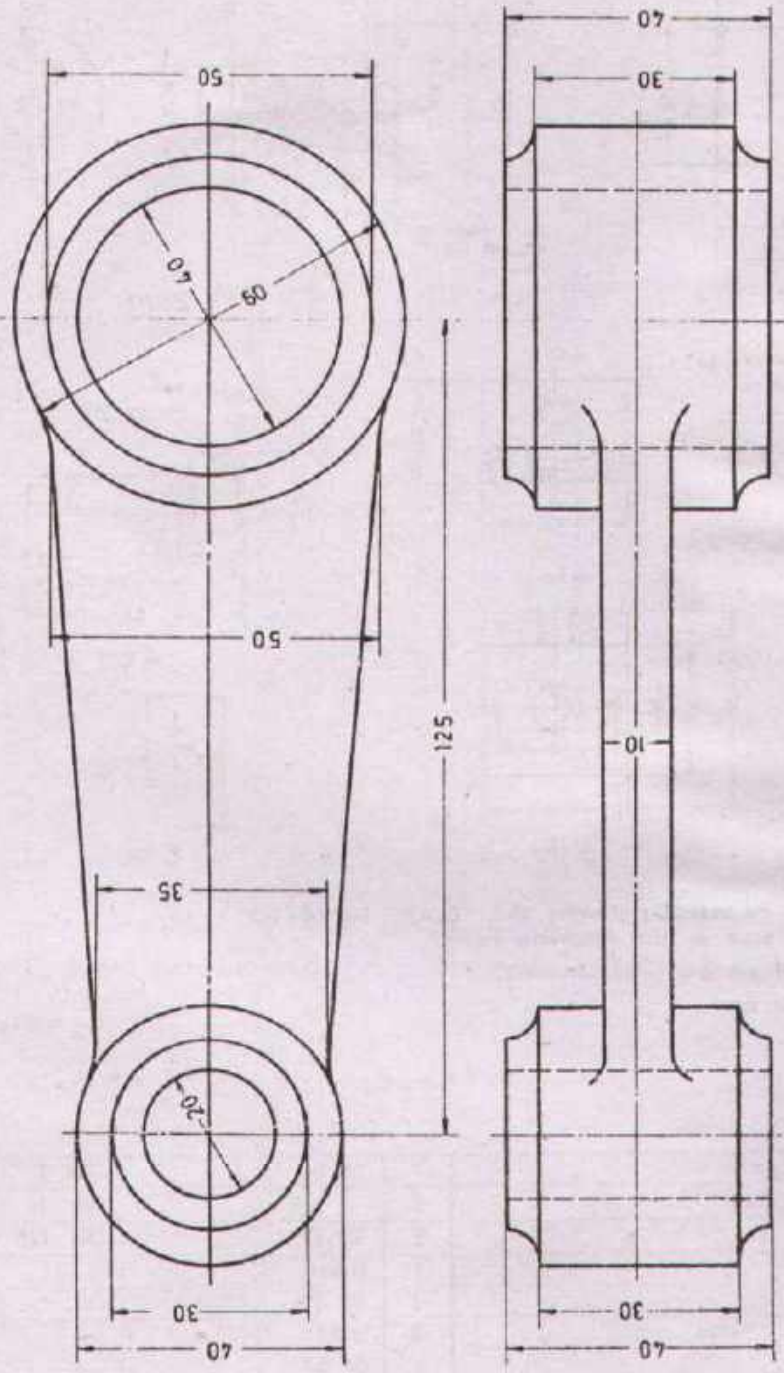
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING


PAK-GERMAN TECHNICAL TRAINING PROGRAMME

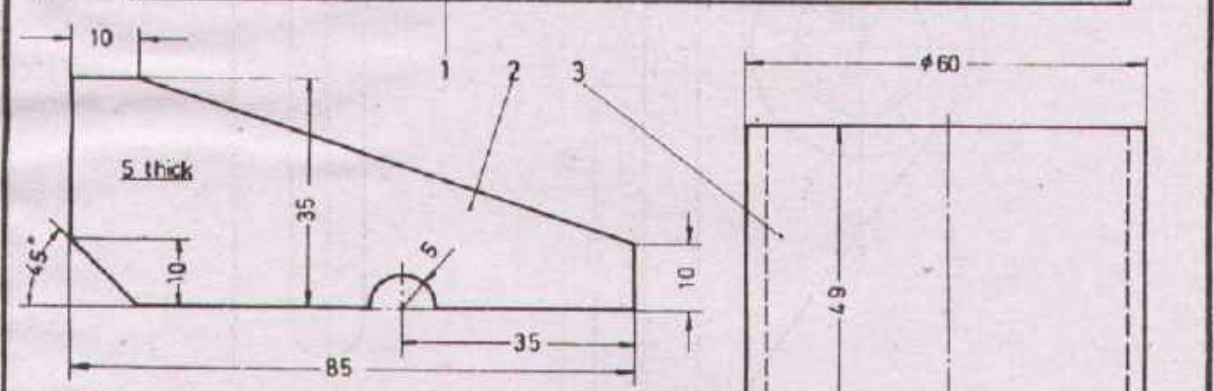
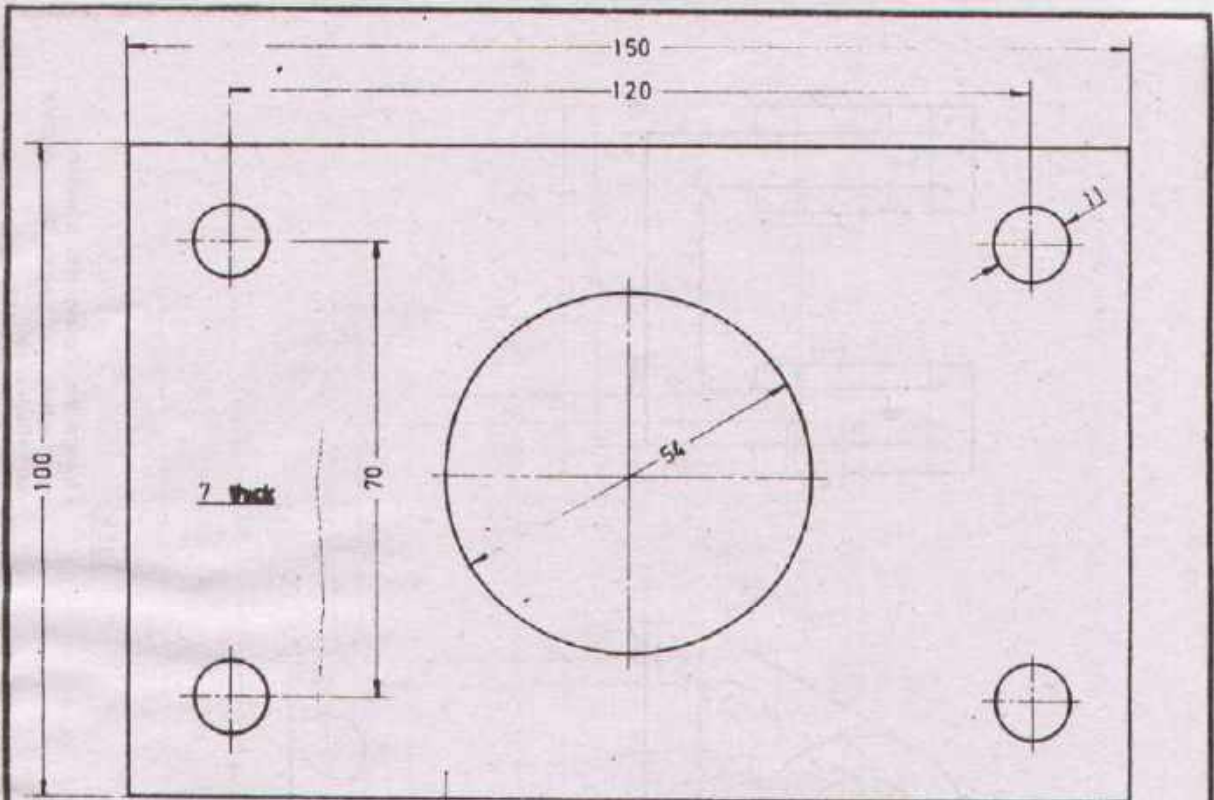
Trade Practice **2**
No.33



Task Change the casting construction of this connecting rod into a welding construction.

Note Symbolic representation is required.

Scale 1:1	CONNECTING ROD		Material GG-15
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 34



Task:

- Prepare the assembly drawing of the support
- 1. Elevation view in full section.
- 2. Plan view.

Note

Part 4 is circular disk cut out of part 1!

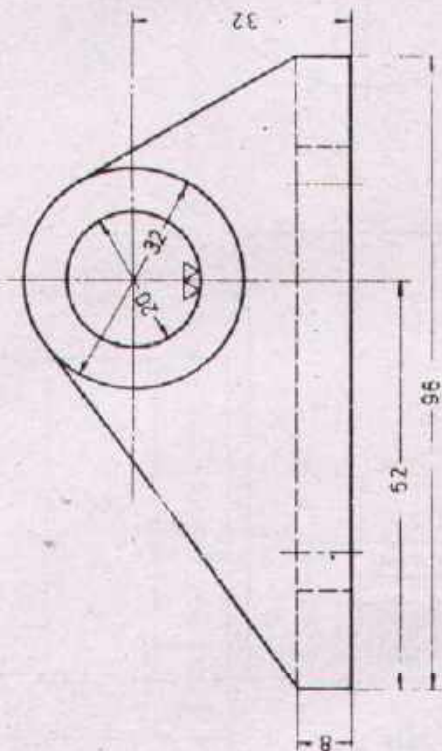
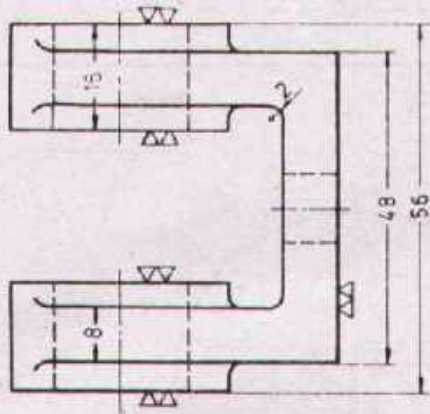
1	Top ϕ 53 x 3	4	St. 37	
2	Pipe ϕ 60 x 3	3	St. 37	
2	Rib 85 x 35 x 5	2	St. 37	
1	Base 150 x 100 x 7	1	St. 37	
NO. REQD	DESCRIPTION	PART NO.	MATERIAL	STANDARD

Scale 1:1		DETAIL OF SUPPORT		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____	



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No.35

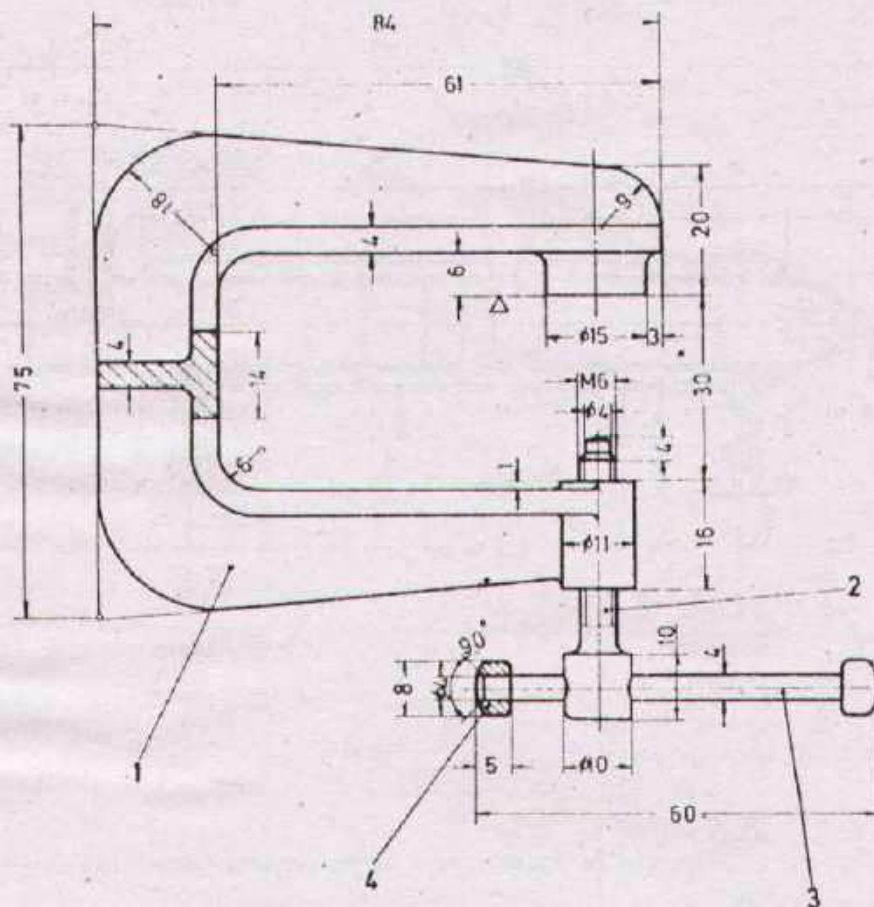


Task: Change the casting into a welding construction and prepare the complete workshop drawing


Scale 1:1	BEARING BRACKET .		Material GG-15
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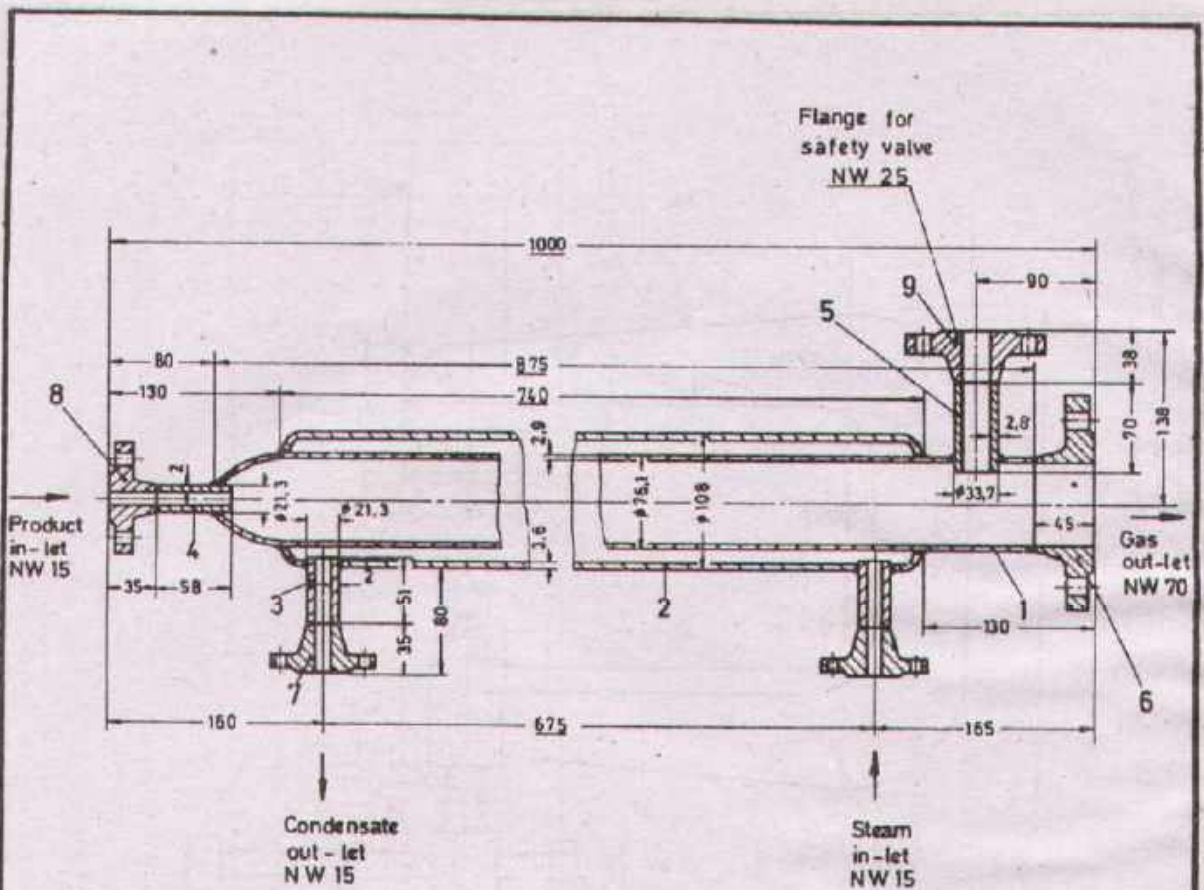
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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	DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING	Trade Practice 2 No.36
	PAK-GERMAN TECHNICAL TRAINING PROGRAMME	



Task: Change the casing into a welding construction and prepare the workshop drawing of part No 1.

Scale 1:1	SCREW CLAMP		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME		Trade Practice 2 No 37	



Task

Prepare the symbolic view of the evaporator (scale 1:2.5)

Note

NW = Nominal width
The flanges have 6 holes each.

1	Welding Flange 25 / 33,7	9	St. 37	DIN 2633
1	Welding Flange 15 / 21,3	8	St. 37	DIN 2633
2	Welding Flange 15 / 21,3	7	St. 37	DIN 2633
1	Welding Flange, 65 / 76,1	6	St. 37	DIN 2633
1	Pipe 33,7 x 2,6 x 70	5	St. 35	
1	Pipe 21,3 x 2 x 58	4	St. 35	
2	Pipe 21,3 x 2 x 51	3	St. 35	
1	Pipe 108 x 3,6 x 740	2	St. 35	
1	Pipe 76,1 x 2,9 x 875	1	S 35	

No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
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Scale 1:5	EVAPORATOR		
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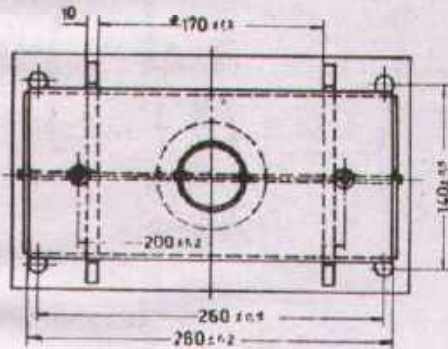
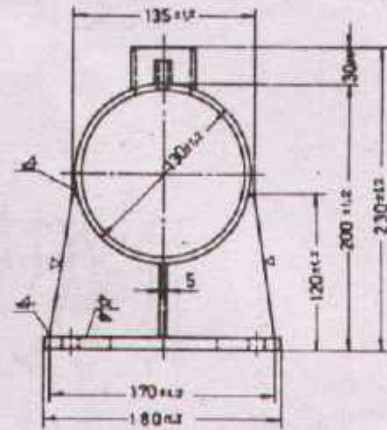
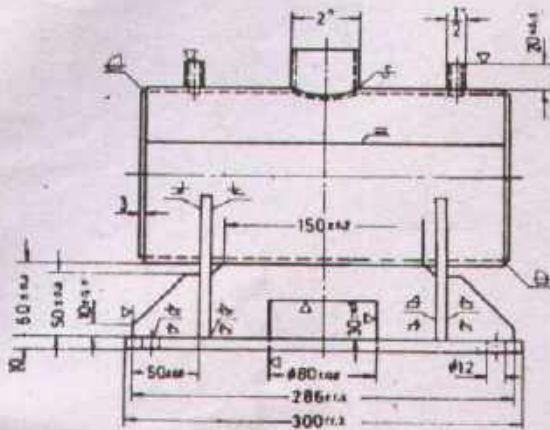
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 38



Task:

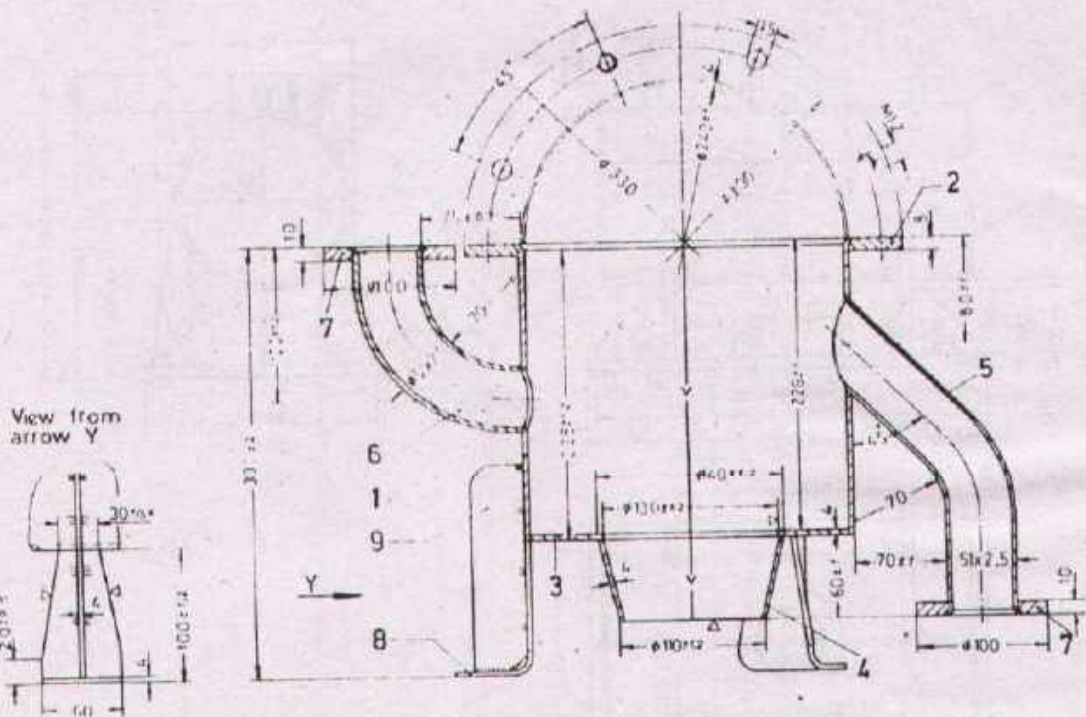
1. Fill in the list of parts on this sheet.
2. Prepare the two sub-assemblies in pictorial representation (scale 1:2.5) of
 - 2.1-Tank
 - 2.2-Stand

NO. REQD.	DESCRIPTION	PART NO.	MATERIAL	STANDARD
CONTAINER				
Drawn	Name _____ Date _____	Checked	Name _____ Date _____	



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 39



1. Complete the given assembly drawing with the correct welding symbols.
2. Fill in the list of parts on this sheet
3. Prepare the three sub-assemblies in symbolic representation of
 - 3.1 - Cylinder
 - 3.2 - Pipe No 5
 - 3.3 - Pipe No 6
4. Give the stretched length of pipes No 5 & 6

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NO. REQD.	DESCRIPTION	PART NO.	MATERIAL	STANDARD
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Scale 1:5 **TANK** Material St. 37

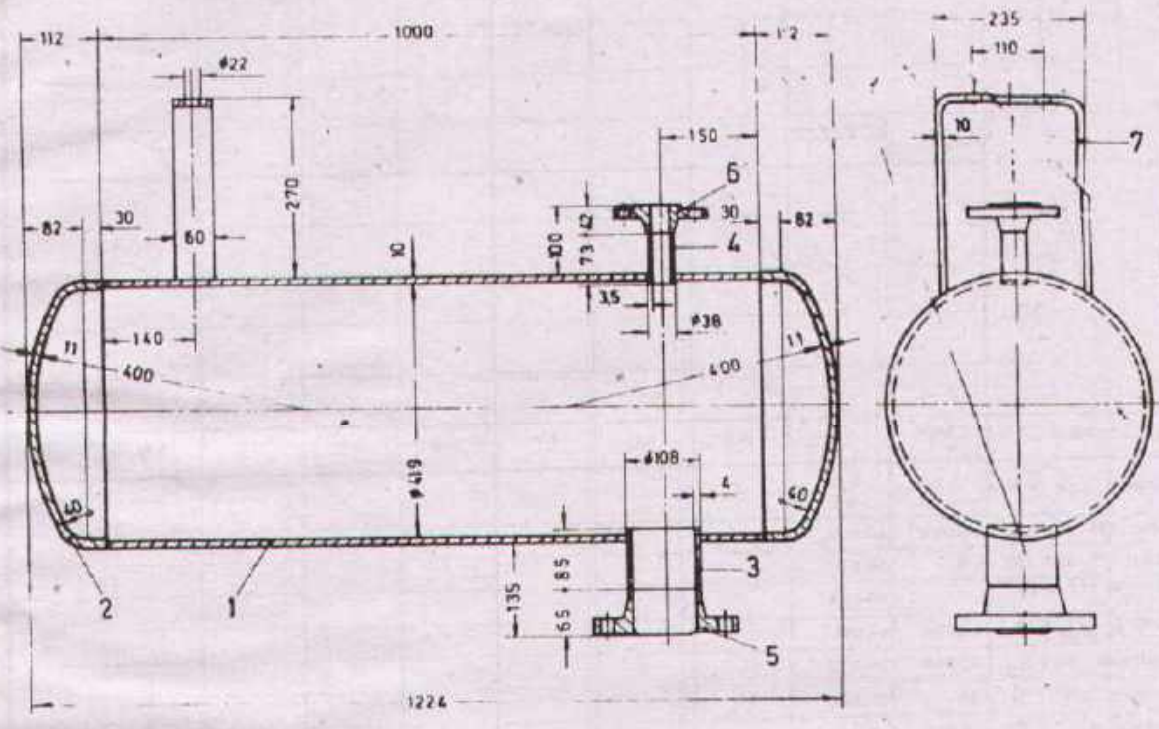
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 40



Task

Prepare the pictorial view of the container along with the complete list of parts.

NO. REQD.	DESCRIPTION	PART NO.	MATERIAL	STANDARD
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Scale 1:10 **CONTAINER**

Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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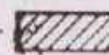
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

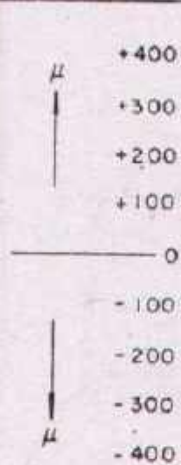
Trade Practice **2**
No. 41

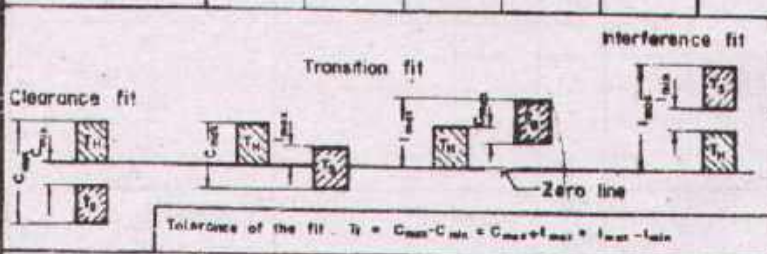
Basic holes H7;H8

Nominal off sizes in $\mu = 1/1000\text{mm}$

 Internal sizes (holes)

 External sizes (shafts)

μ 											
	ISO - symbol:	H7	r6	m6	h6	f7	H8	u8	h9	f8	b9
	Nominal size S_N 90mm	+35 0	+75 +51								
	Upper off-size O_u	+0,036	+0,073								
	Lower off-size O_L	0	+0,061								
	Nominal off-size $O_{u \text{ and } O_L}$	0	+0,073								
	Nominal off-size $O_{u \text{ or } O_L}$	+0,036	+0,061								
	Maximum size S_M	90,036	90,073								
	Minimum size S_L	90	90,061								
	Tolerance T	0,036	0,022								
Fit		H7/r6	H7/m6	H7/h6	H7/f7		H8/u8	H8/h9	H8/f8	H8/b9	
Maximum clearance c_{max}	-	-									
Minimum clearance c_{min}	-	-									
Maximum interference i_{max}	-	0,036									
Minimum interference i_{min}	-	0,018									
Interference fit x	-	x									
Transition fit x	-	-									
Clearance fit x	-	-									
Tolerance of the fit T_f	-	0,057									



Task:
 Complete the above table by entering the required details.
 x The type of fit has to be crossed (x) in the respective column

ISO FITS

Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 42

Basic shafts h7, h8

Nominal off sizes in $\mu = \pm 1/1000 \text{ mm}$



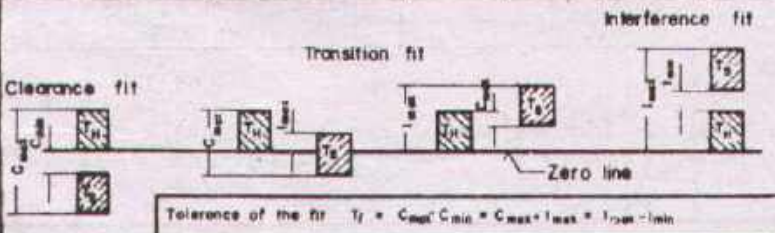
Internal sizes (holes)



External sizes (shafts)

μ	+400																			
	+300																			
	+200																			
	+100																			
	0																			
	-100																			
	-200																			
	-300																			
μ	-400																			

ISO-symbol:	x																			
Nominal size S_N	mm																			
Upper off-size O_u																				
Lower off-size O_l																				
Nominal off-size																				
Nominal O, T -size																				
Maximum size S_H																				
Minimum size S_L																				
Tolerance	T																			
Fit:																				
Maximum clearance	C_{max}																			
Minimum clearance	C_{min}																			
Maximum interference	I_{max}																			
Minimum interference	I_{min}																			
Interference fit	xx																			
Transition fit	xx																			
Clearance fit	xx																			
Tolerance of the fit	T_f																			



Task:

- x Enter ISO-symbols according to your own choice in this column.
- Complete the above table
- xx Mark the type of fit by crossing the respective column.

ISO FITS

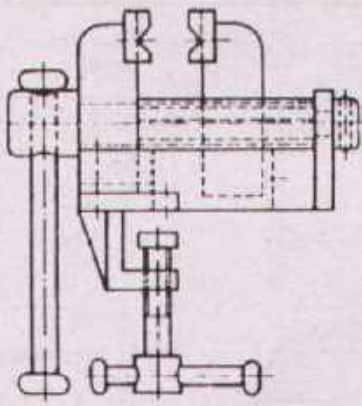
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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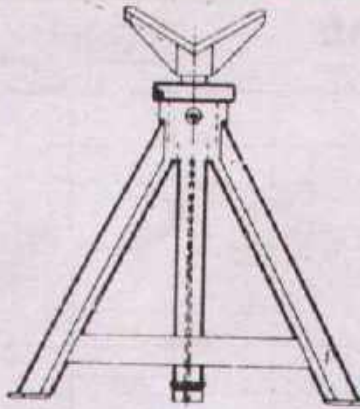
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

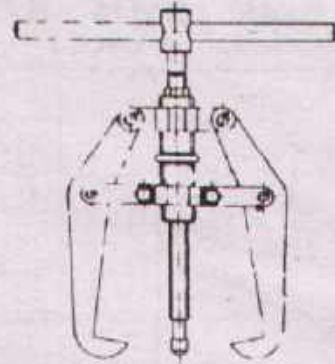
Trade Practice **2**
No. 43



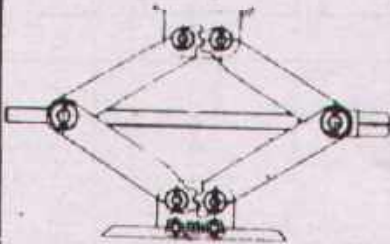
VICE



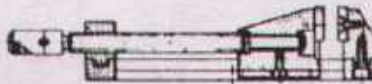
SUPPORT



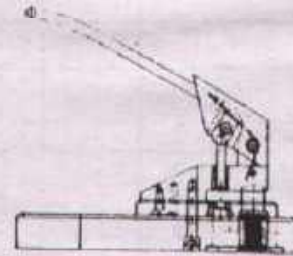
PULLER



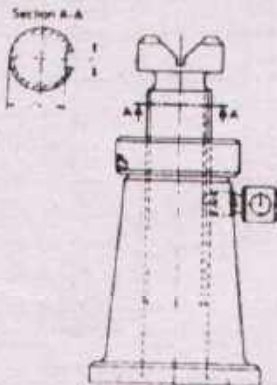
CAR JACK



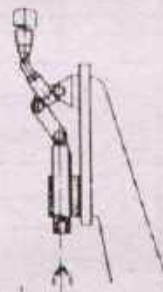
MACHINE VICE



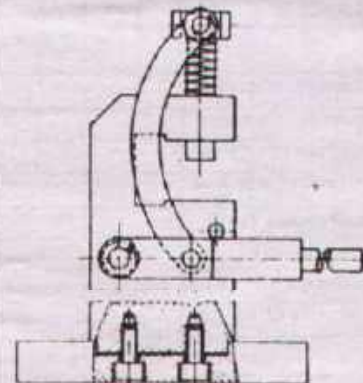
PAPER PUNCH



SCREW JACK



TOGGLE PRESS



LINK PRESS

Task:

Choose any 3 of these workpieces from the store of your Training Centre. Use them as models and prepare a complete set of workshop drawings each.

DRAWING FROM MODELS

Drawn

Name
Date

Checked

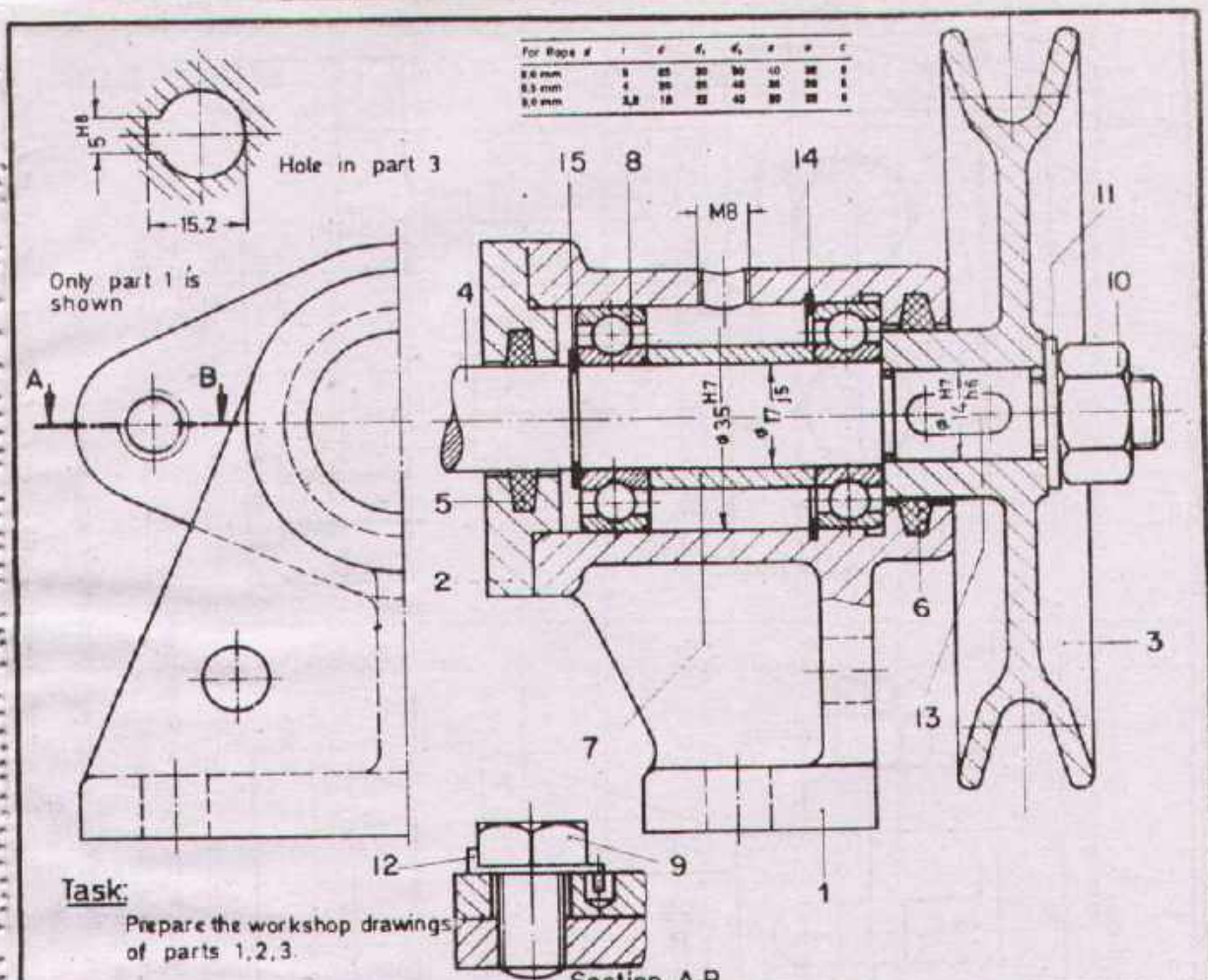
Name
Date



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 44



Task:

Prepare the workshop drawings of parts 1, 2, 3.

No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
1	Circlip 17x1	15	Spring steel	DIN 471
1	Circlip 35x1,5	14	Spring steel	DIN 472
1	Parallel key A 5x3x15	13	St. 60	DIN 6885
2	Locking plate 10,5	12	St VII 23	DIN 432
1	Washer $\phi 13$	11	St	DIN 125
1	Hexagon nut M12	10	5.8	DIN 934
2	Hexagon bolt M 10x15	9	5.8	DIN 933
2	Deep groove ball bearing 6003	8		DIN 625
1	Distance bush	7	St 33	
1	Felt packing 5x5 x100	6	Felt	
1	Felt packing 5x5 x 70	5	Felt	
1	Shaft	4	St. 60	
1	Rope pulley	3	GG-22	
1	Cover	2	GG-18	
1	Bearing support	1	GG-18	

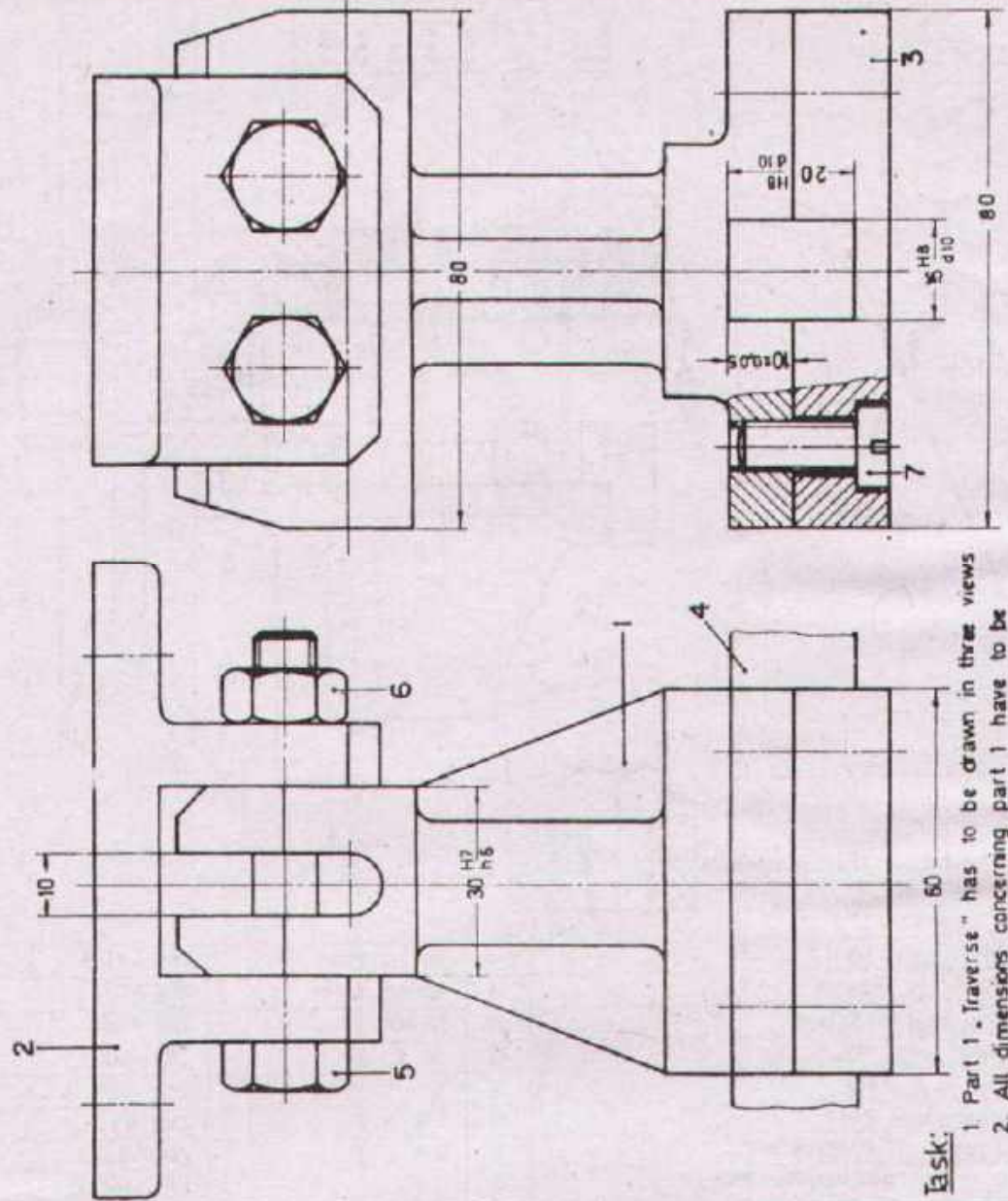
No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
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Scale 1:1 **ROPE PULLEY SUPPORT**

Drawn	Name Date	Checked	Name Date
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
 PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No. 45



Task:

1. Part 1 „Traverse“ has to be drawn in three views
2. All dimensions concerning part 1 have to be transferred into the drawing
Give also necessary dimensions for through holes and thread holes
3. Enter the required surface symbols.
Contact-surface with part 4 smooth finished, with part 2 finished, all other roughed.

No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD
4	Cheese head screw M8x18	7	S S	DIN 84
2	Hexagon nut M10	6	S D	DIN 933
2	Hexagon head bolt M10x65	5	S D	DIN 931
1	Slide	4	C 15	
1	Plate	3	St. 50	
1	Support plate	2	St. 37	
1	Traverse	1	St. 50	

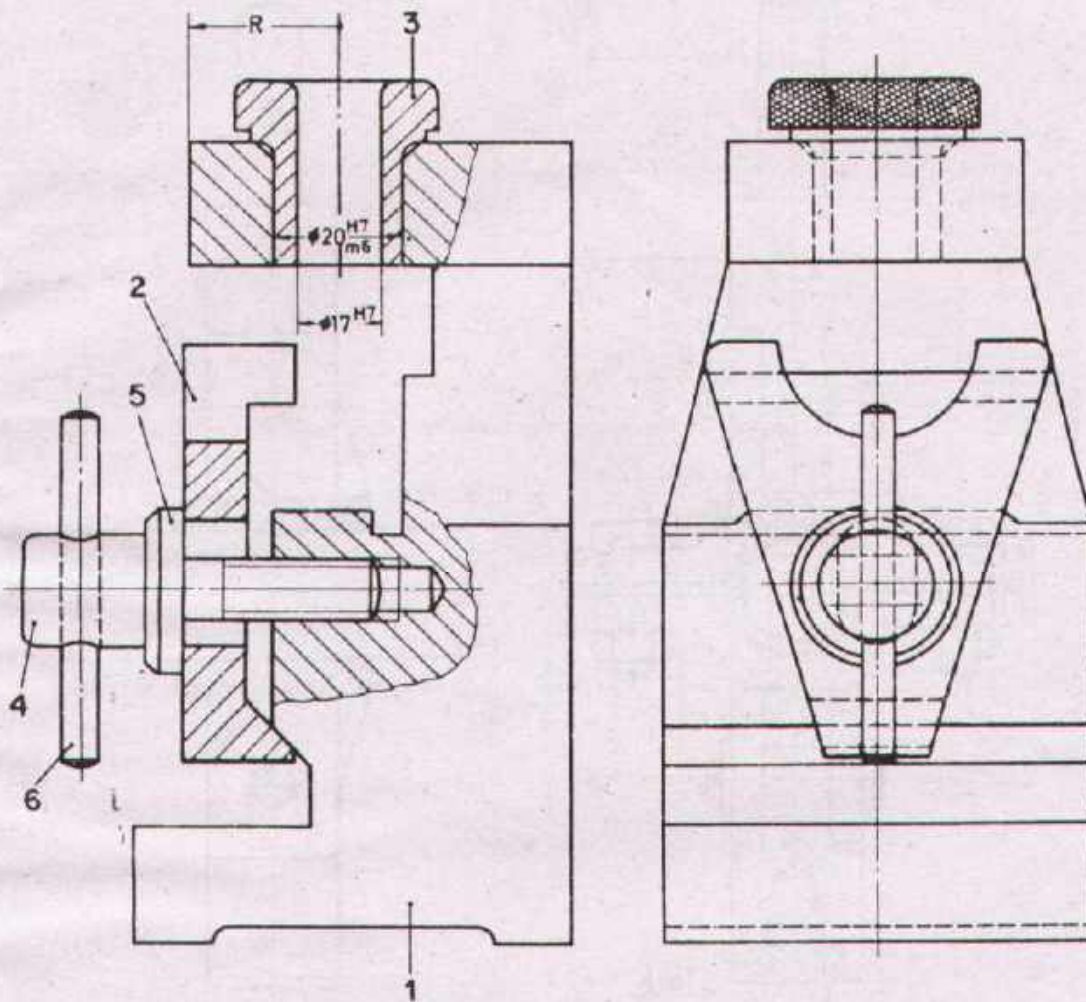
Scale 1:1 **SUPPORT**

Drawn Name _____ Date _____ Checked Name _____ Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 46



Task

Prepare the workshop drawings in full scale of parts 1,2,3,4, with required dimensions and surface symbols. Sizes are to be taken from the assembly drawing. Fill in the list of parts

1	Cylindrical pin	6	St 50 K	DIN 7
1	Washer	5	St 33	DIN 1440
1	Clamping screw	4	St 60	
1	Drilling bush	3	C 15	
1	Clamping bridge	2	St. 60	
1	Main body	1	GG-22	
No. REQD	DESCRIPTION	PART No.	MATERIAL	STANDARD

Scale 1:1

DRILLING FIXTURE

Drawn

Name _____
Date _____

Checked

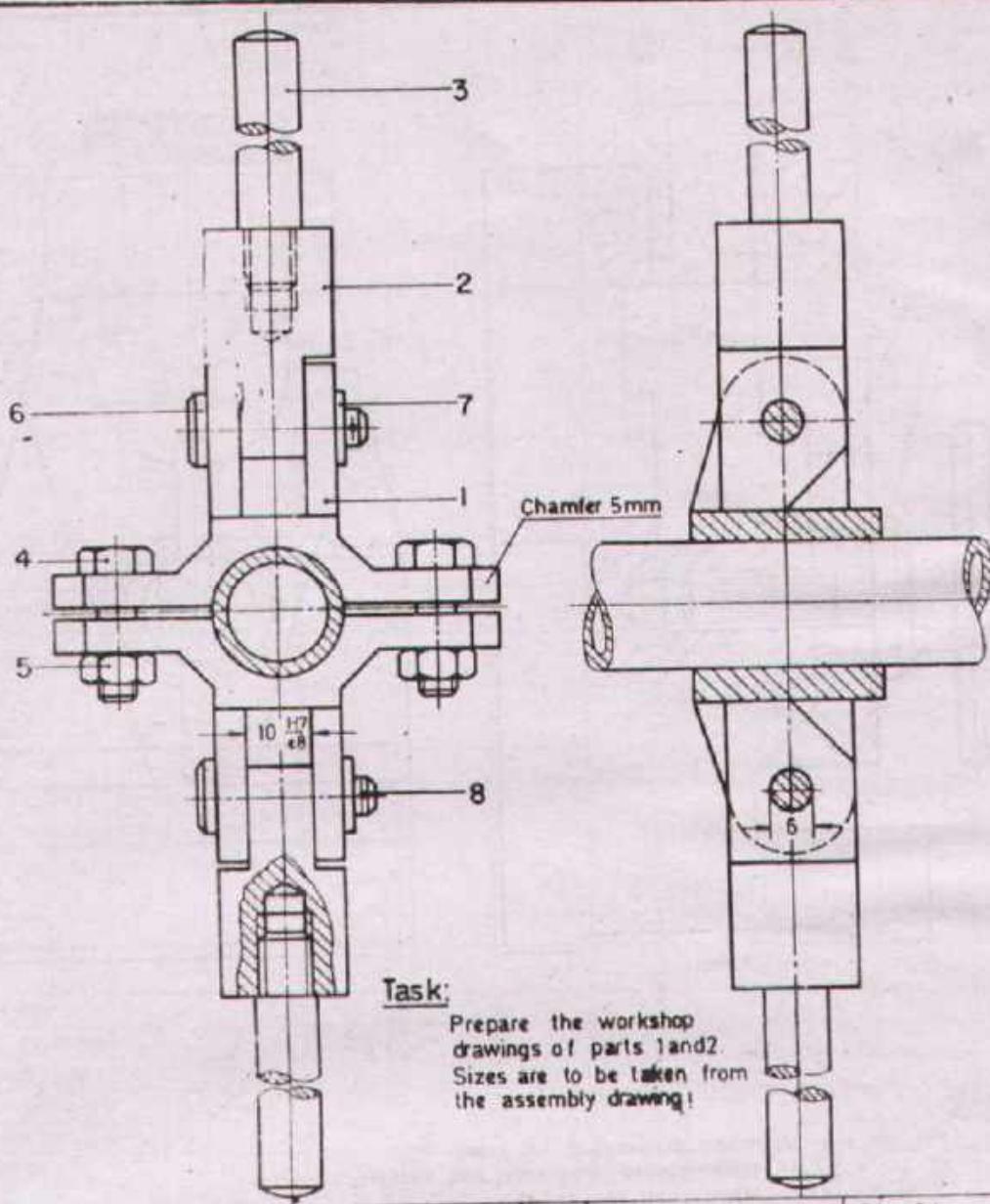
Name _____
Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 47



Task:

Prepare the workshop drawings of parts 1 and 2. Sizes are to be taken from the assembly drawing!

2	Split pin 1.5x10	8	St	DIN 94
2	Washer	7	St	DIN 1441
2	Bolt 6.5x25x22.5	6	St. 50 K	DIN 1433
2	Hexagon nut M6	5	5 S	DIN 934
2	Hexagon head bolt M 6x20	4	5 D	DIN 933
2	Handle	3	St 33	
2	Lever	2	St. 37	
2	Holder	1	St. 50	
No. REQD.	DESCRIPTION	PART No.	MATERIAL	STANDARD

Scale 1:1

LEVER SYSTEM

Drawn

Name _____
Date _____

Checked

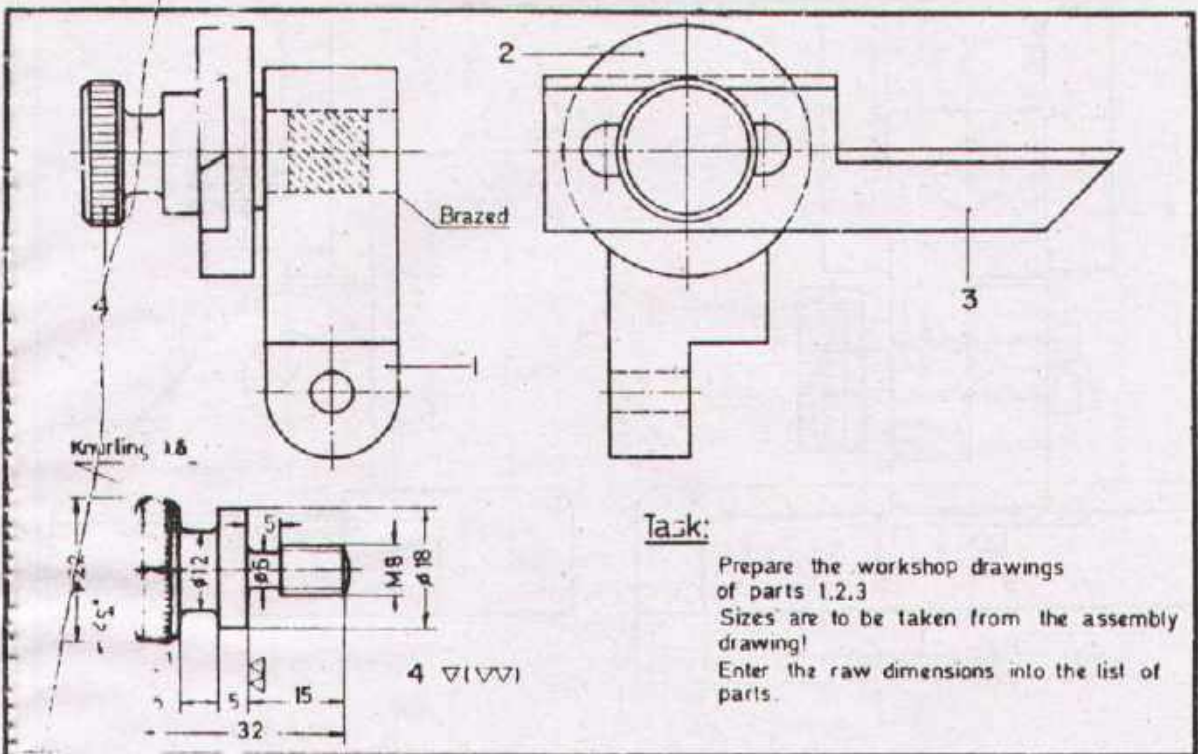
Name _____
Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

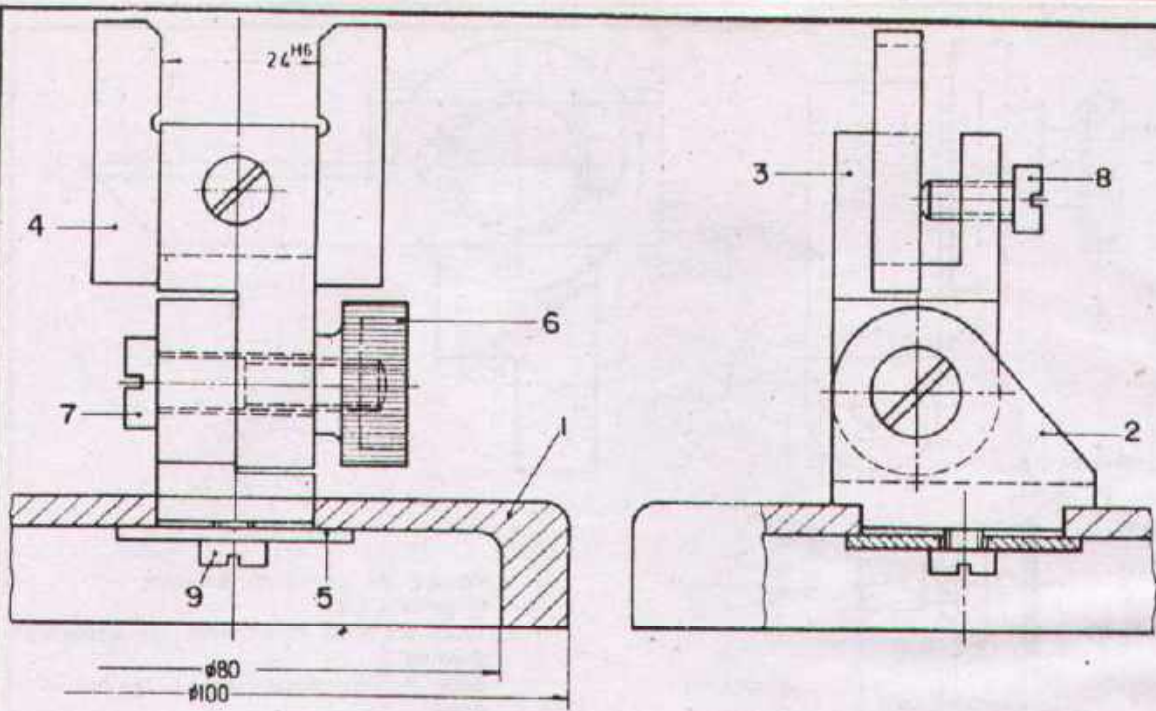
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 48



1	Knurled screw	4	Ms 63	
1	Bevelled rule	3	C 15	
1	Guide	2	St 60	
1	Holder	1	St 50	
JD	DESCRIPTION	PART No	MATERIAL	RAW DIMENSIONS

Scale 1:1	GUIDE		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____



Task

Prepare the workshop drawings of parts 1, 2, 3 & 4.
 Sizes are to be taken from the assembly drawing!

Surfaces for the size 24^{H6} at part 4
 are ground and surface hardened.

1	Cheese head screw M6 x 8	9	SS	DIN 84
1	Cheese head screw M6 x 15	8	SS	DIN 84
1	Cheese head screw M8 x 35	7	SS	DIN 84
1	Knurled nut $\varnothing 25 \times 20$	6	Ms 58	
1	Washer	5	St. 123	
1	Gauge	4	C 15	
1	Holder	3	St. 50	
1	Support	2	St. 50	
1	Base plate	1	GG-1B	
No REQD	DESCRIPTION	PART No	MATERIAL	STANDARD

Scale 1:1

GAUGE HOLDER

Drawn

Name _____
 Date _____

Checked

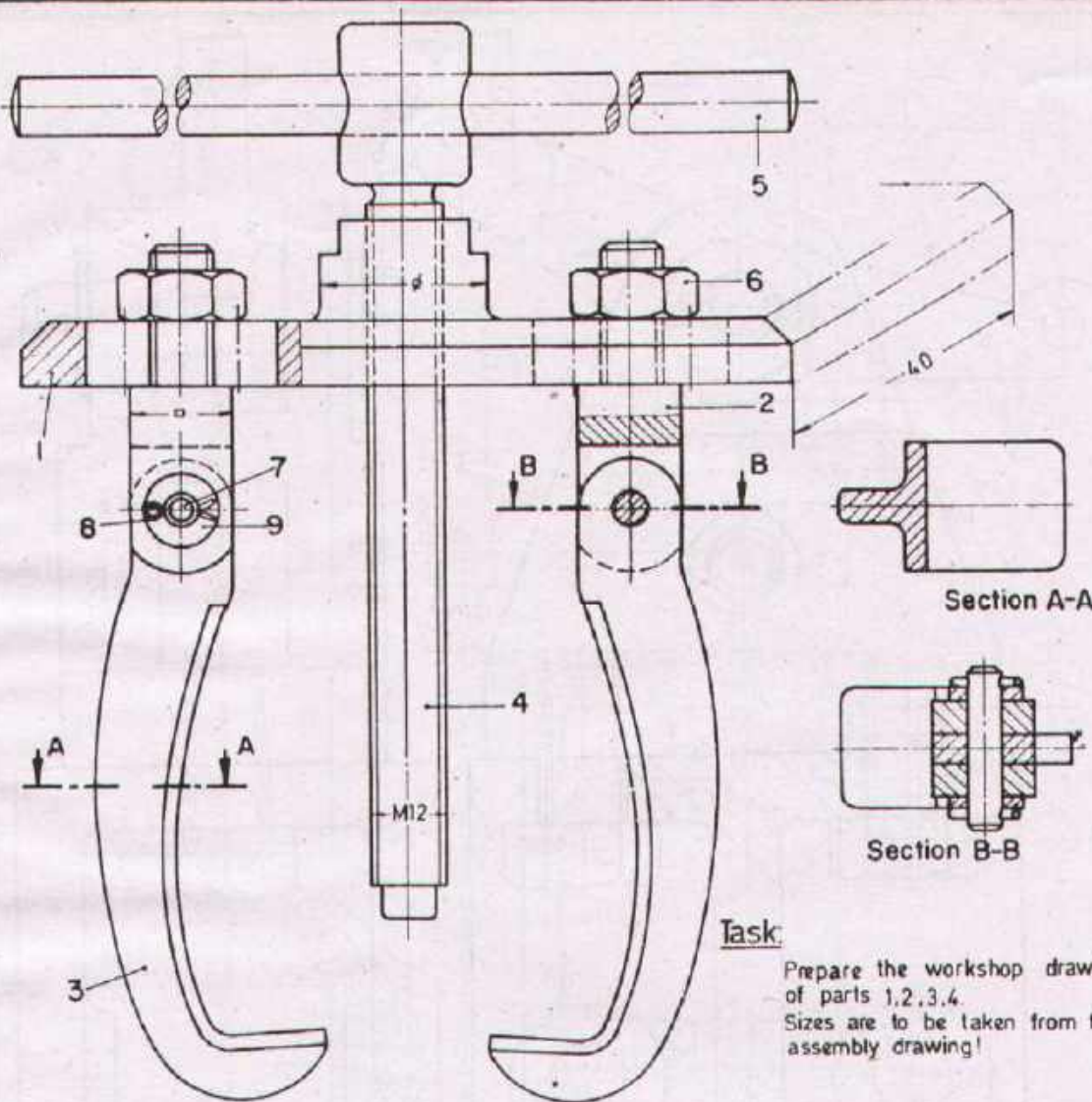
Name _____
 Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAX - GERMAN TECHNICAL TRAINING PROGRAMME


Trade
 Practice **2**
 No 50

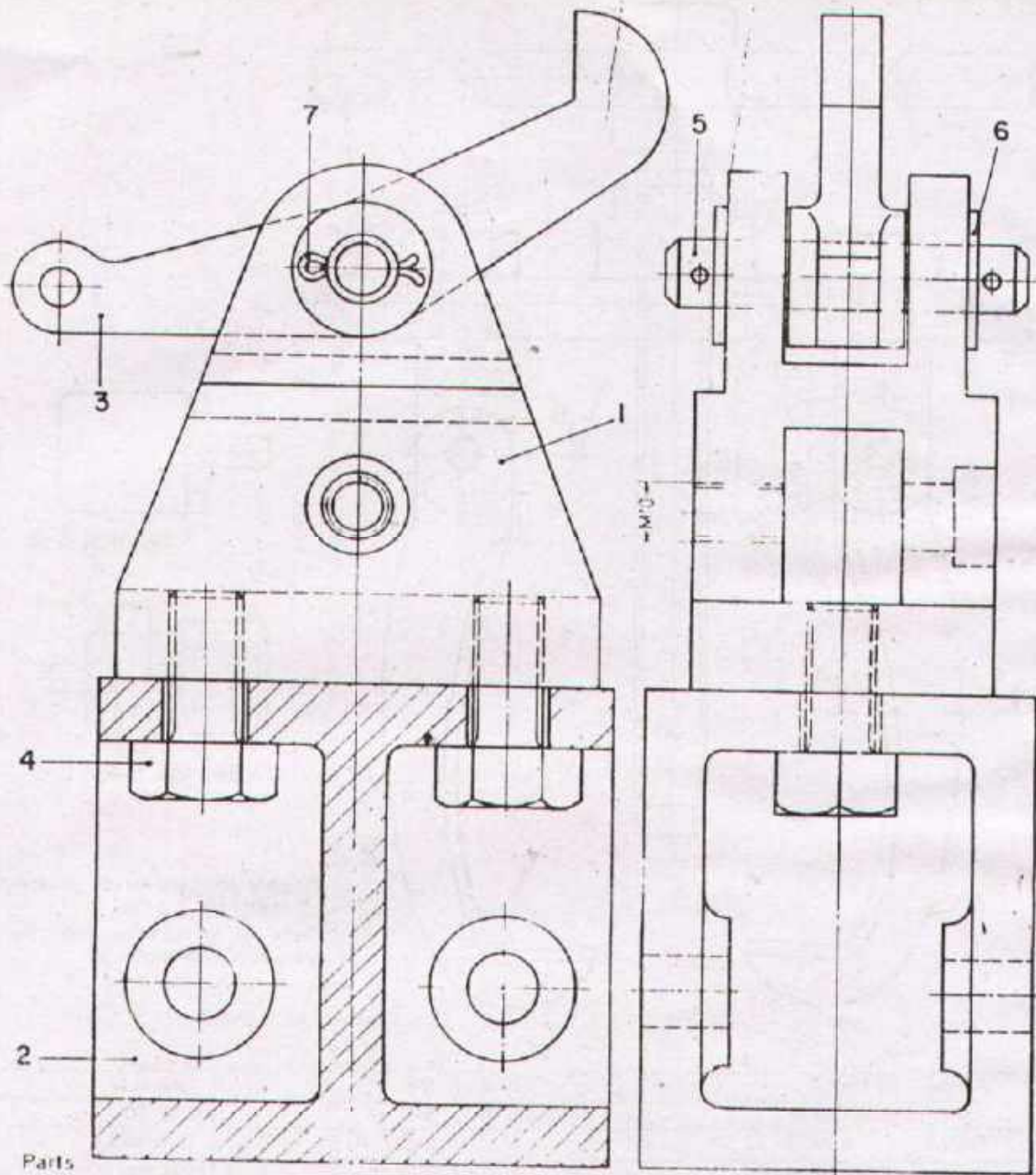


Task:

Prepare the workshop drawings of parts 1,2,3,4. Sizes are to be taken from the assembly drawing!

4	Bright washer	9	St.	DIN 1440
4	Split pin 1,5x10	8	St	DIN 94
2	Pin 6x28x22	7	St. 37 K	DIN 1433
2	Hexagon nut M10	6	4 D	DIN 934
1	Handle $\varnothing 10 \times 200$	5	St. 37 K	
1	Spindle	4	St. 50	
2	Claw	3	Malleable Cast iron 35	
2	Link bolt	2	St. 50	
1	Base plate	1	St. 50	
No. REQD	DESCRIPTION	PART No	MATERIAL	STANDARD

Scale 1:1	PULLER		
Draw	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 51




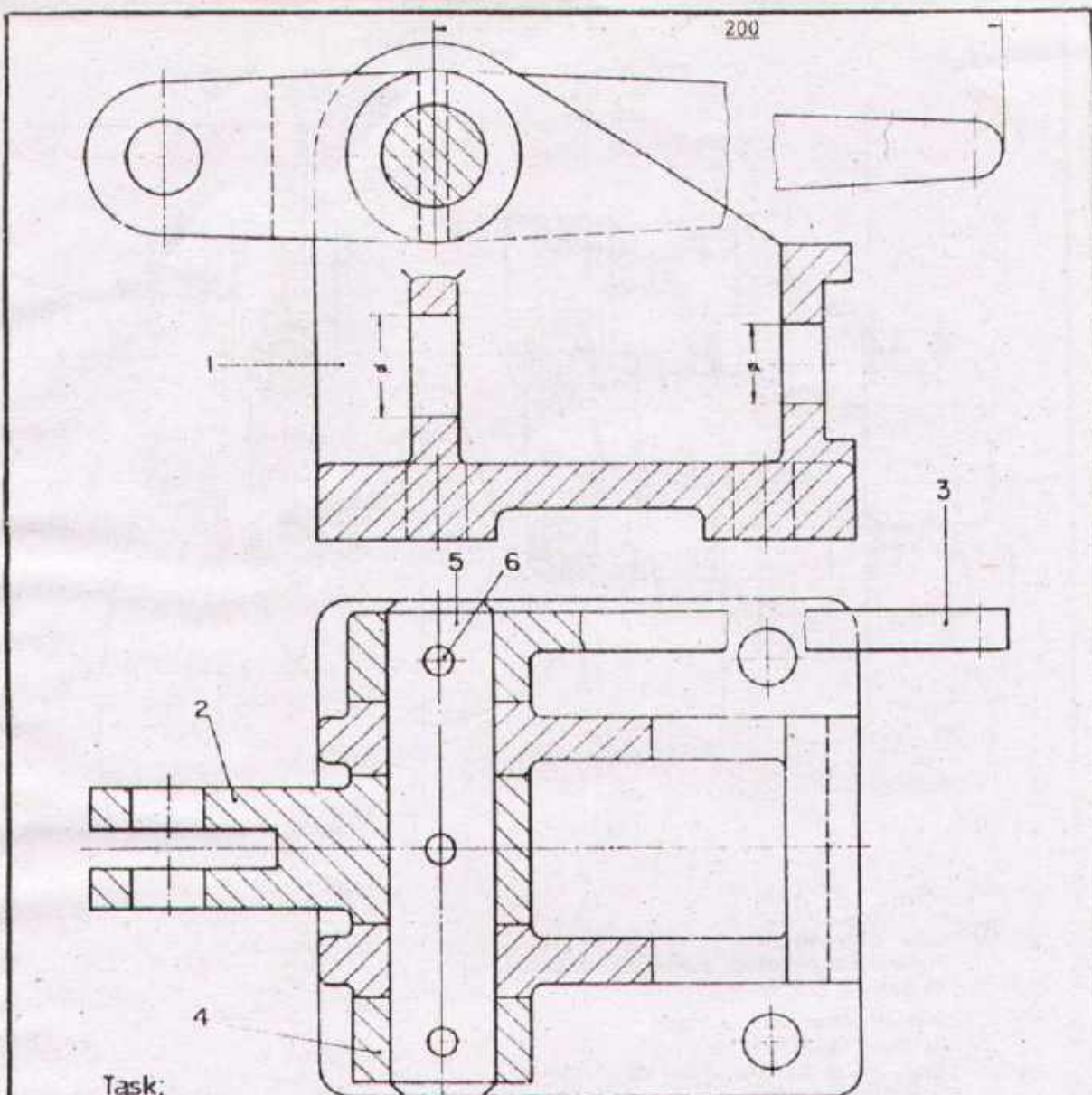
Parts

- | | |
|--|--------------------------------|
| 1 Support, St 37 | 5 Pin 12x50x50 St 50 K |
| 2 Base, St 33 | 6 Washer, ϕ 13 mm, St (2) |
| 3 Ratchet C 15 | 7 Split pin 4x20 St (2) |
| 4 Hexagon head bolt, M12x25, 5D, DIN 933 (2) | |

Task

Prepare the workshop drawing of parts 1, 2 & 3.
 Sizes are to be taken from the assembly drawing!

Scale 1:1	RATCHET SUPPORT		
Drawn	Name	Checked	Name
	Date		Date
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING <small>PAK GERMAN TECHNICAL TRAINING PROGRAMME</small>			Trade Practice 2 No. 52



Task:

Prepare the complete workshop drawings of parts 1, 2 & 3
 Sizes are to be taken from the assembly drawing!

3	Cylindrical pin 5 _{m6} X28	6	St 50 K	DIN 7
1	Pin 18 _{H7} X 80	5	St 50 K	DIN 1433
1	Ring	4	St 33	
1	Lever	3	St 50	
1	Lever	2	St 50	
1	Base	1	GG-18	
No. REQD	DESCRIPTION	PART No	MATERIAL	STANDARD

Scale 1:1

LEVER SWITCH

Drawn

Name _____
 Date _____

Checked

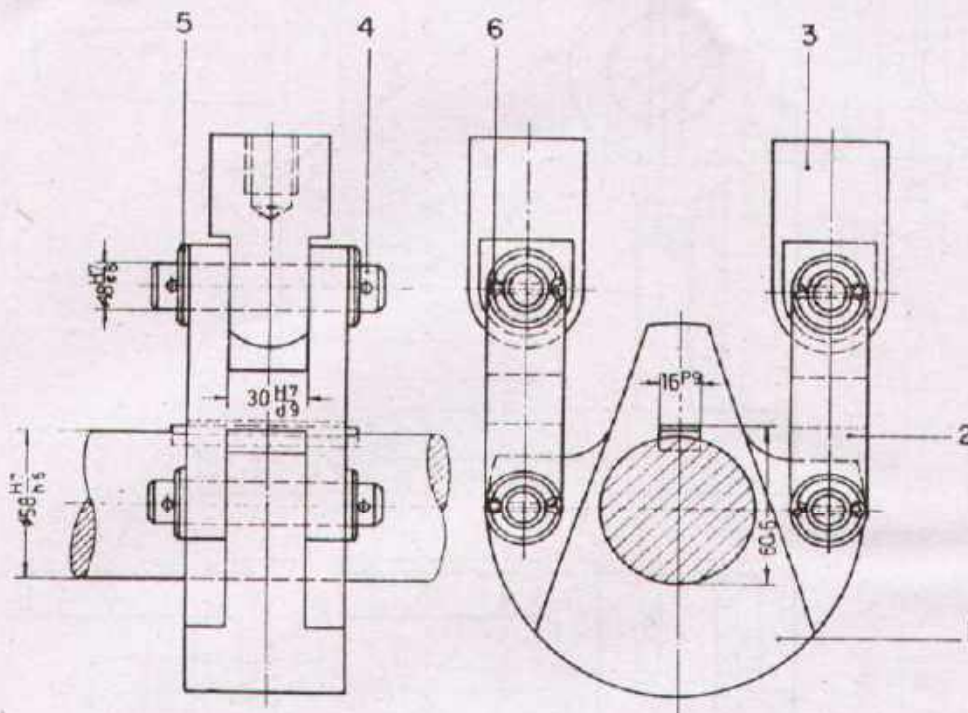
Name _____
 Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No. 53



Task:

Prepare the workshop drawings of parts 1, 2, 3 in scale 1:1

Give all dimensions, surface symbols and ISO fits

Sizes are to be taken from the assembly drawing!

8	Split pin 5x30	6	St	DIN 94
8	Washer	5	St	DIN 1440
4	Pin 18 _{g8} x90x75	4	St 50 K	DIN 1433
2	Link	3	St 50	
2	Shackle	2	St 50	
1	Traverse	1	St 60	
No. REQD.	DESCRIPTION	PART No.	MATERIAL	STANDARD

Scale 1:2,5

HANGING SUPPORT

Drawn

Name
Date

Checked

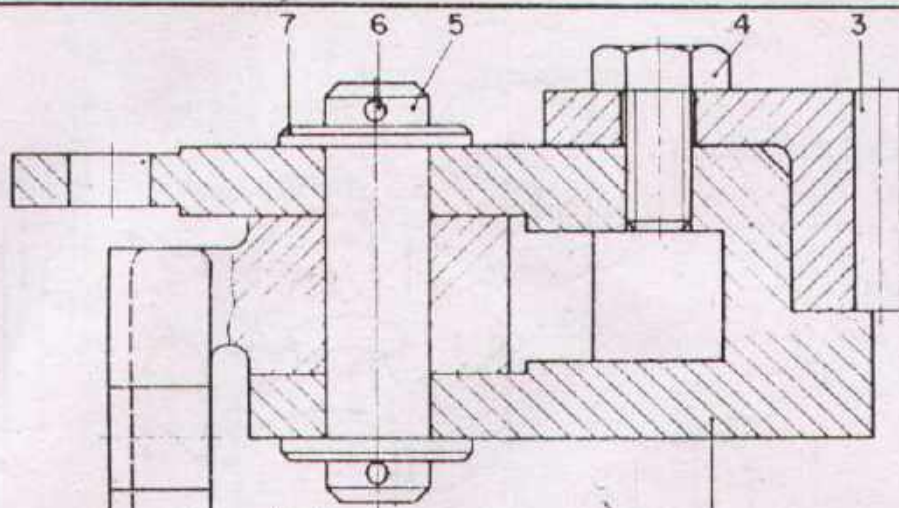
Name
Date



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

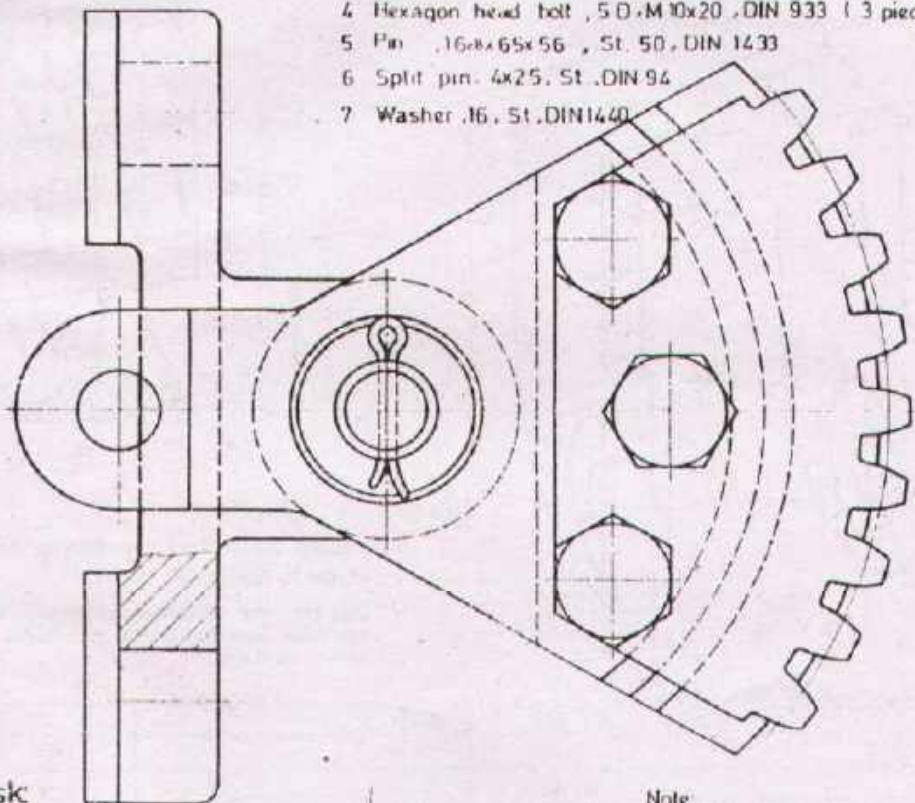
PAK GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 54



Parts:

- 1. Support, GG-18, (2 pieces)
- 2. Lever, St 50, (2 pieces)
- 3. Gear sector, St. 60, m =
- 4. Hexagon head bolt, 5 D.M10x20, DIN 933 (3 pieces)
- 5. Pin, 16x6x56, St. 50, DIN 1433
- 6. Split pin, 4x25, St. DIN 94
- 7. Washer, 16, St. DIN1440




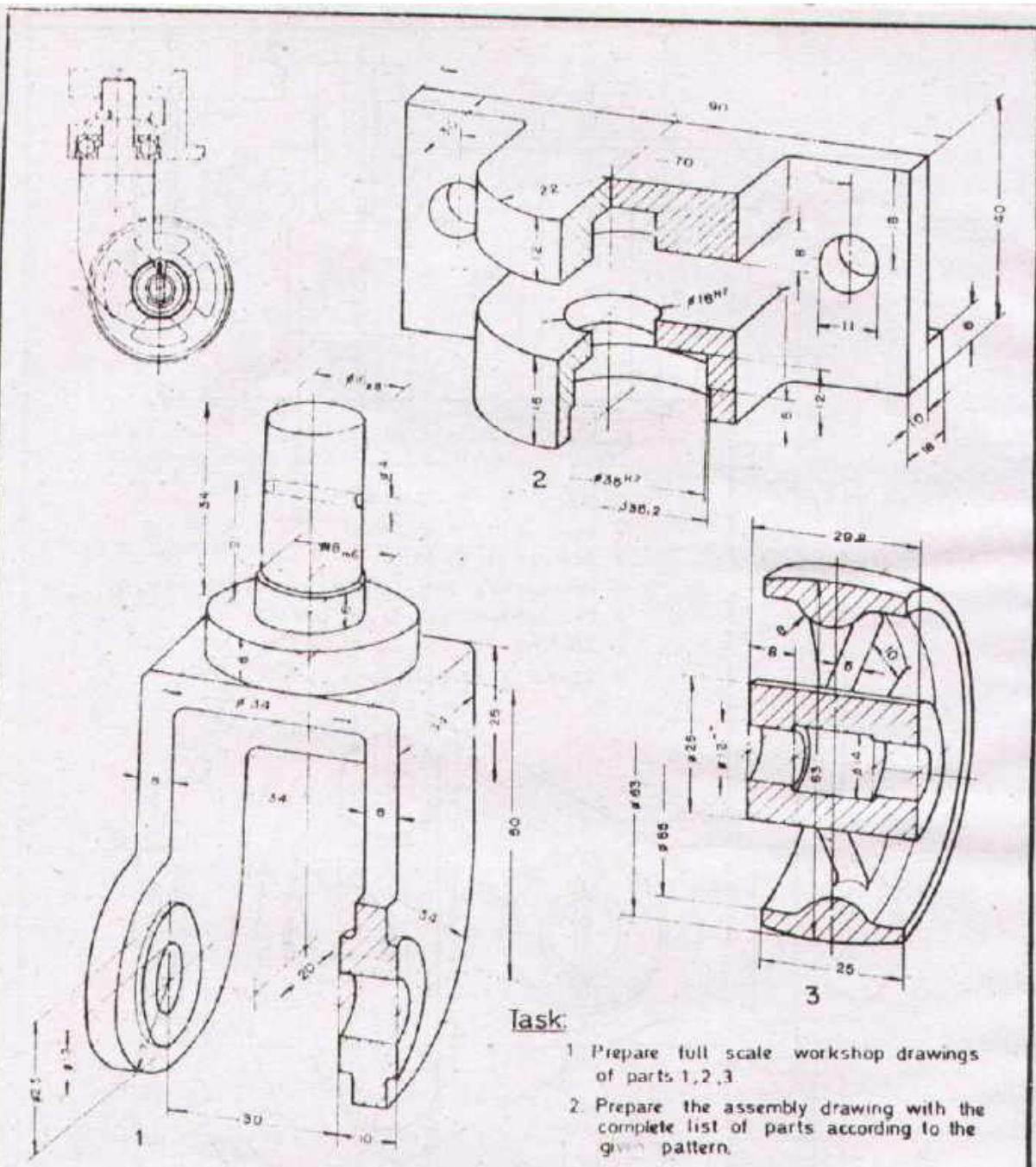
Task

Prepare detail drawings for the production of parts 1,2,3
 Sizes are to be taken from the assembly drawing!

Note


Find out the module of the 'Gear Sector' with the help of the tables in your Handbook

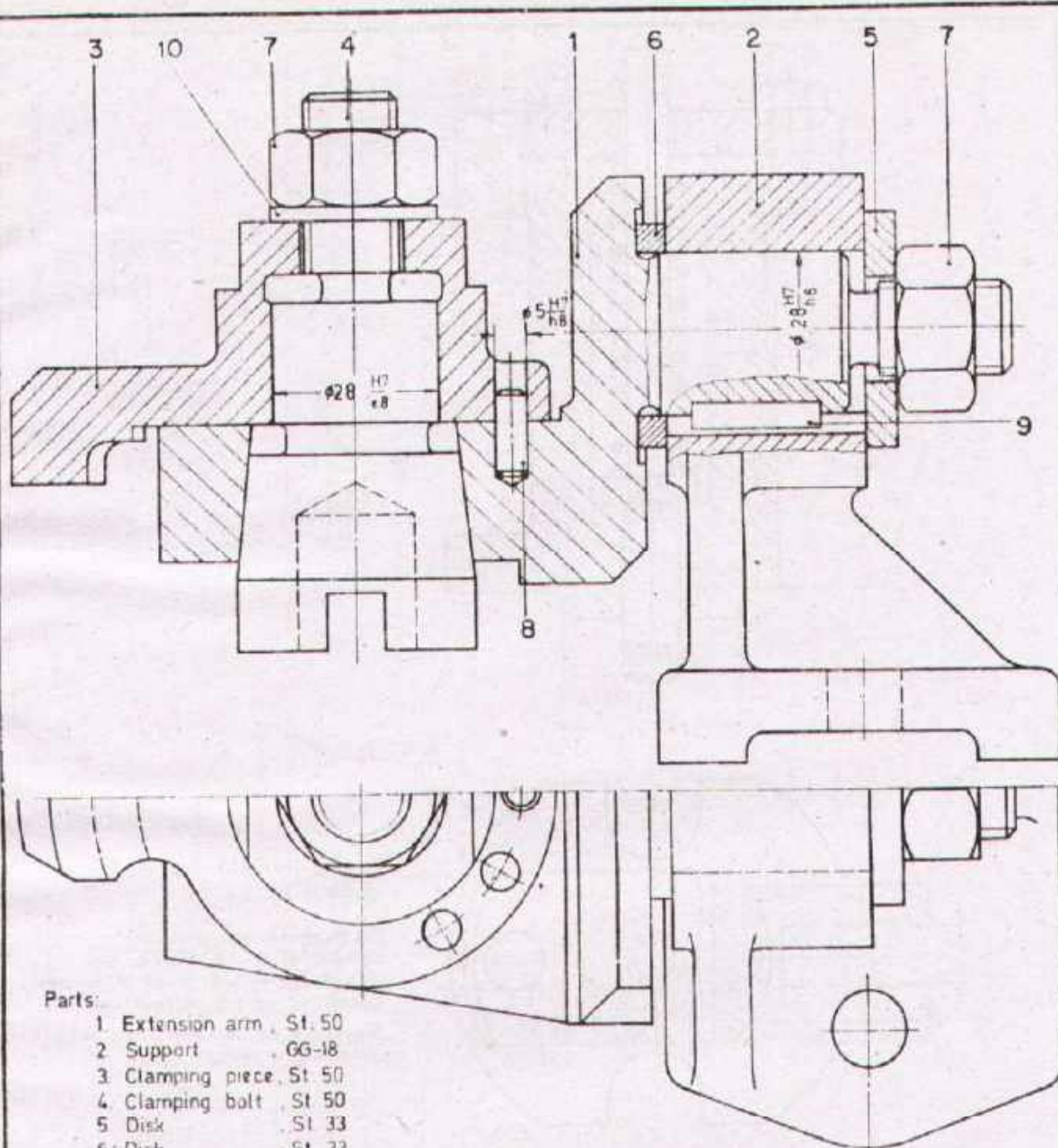
Scale 1:1	LEVER SUPPORT		
Drawn	Name _____ Date _____	Checked _____	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No 55



Task:

1. Prepare full scale workshop drawings of parts 1, 2, 3.
2. Prepare the assembly drawing with the complete list of parts according to the given pattern.

No	DESCRIPTION	PART No	MATERIAL	STANDARD
REGD)				
Scale 1:1	ROLLER BRACKET			
Drawn	Name Date	Checked	Name Date	
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME				Trade Practice 2 No. 56




Parts:

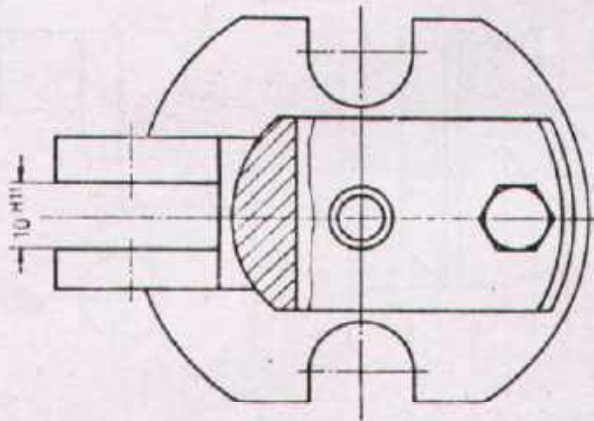
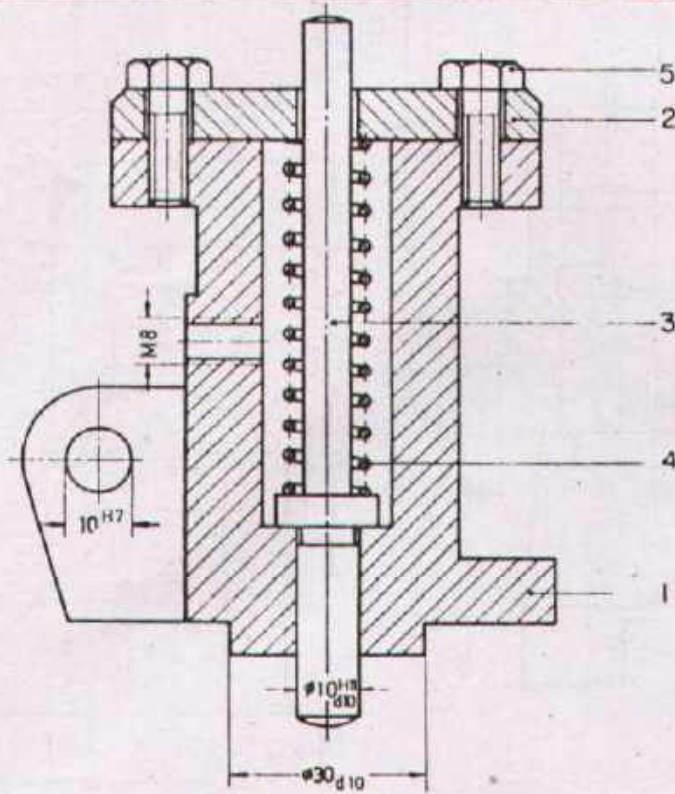
- 1. Extension arm, St. 50
- 2. Support, GG-18
- 3. Clamping piece, St. 50
- 4. Clamping bolt, St. 50
- 5. Disk, St. 33
- 6. Disk, St. 33
- 7. Hexagon nut, M16, 5S, DIN 934 (2 pieces)
- 8. Cylindrical pin, 5_{h8} 14, DIN 7
- 9. Parallel key, A8x5x22, St. 60, DIN 6885.
- 10. Washer, 17, St., DIN 12 5.

(part 1) Extension arm, can be swivelled by 60° to each side in these positions
 part 2, support provides keyways (i.e. total 3 keyways) for part 9 parallel key.

Task

Prepare the workshop drawings of parts 2, 3, 4.

Scale 1:1	CLAMPING DEVICE WITH EXTENSION ARM		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK-GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No. 57



Task:

Prepare the workshop drawings of parts 1, 3, 4.

Pressure spring, part 4:
 Number of elastic windings 10
 in addition at both ends 3/4 winding.
 Length of spring without load 75mm.
 Sizes are to be taken from the
 assembly drawing!

2	Hexagon bolt M6x18	5	8 G	DIN 931
1	Pressure spring	4	Spring steel	
1	Spring bolt	3	50 Cr V 4	
1	Cover	2	St 33	
1	Housing	1	GG-18	
No REWD	DESCRIPTION	PART No	MATERIAL	STANDARD

Scale 1:1 **VALVE TOP**

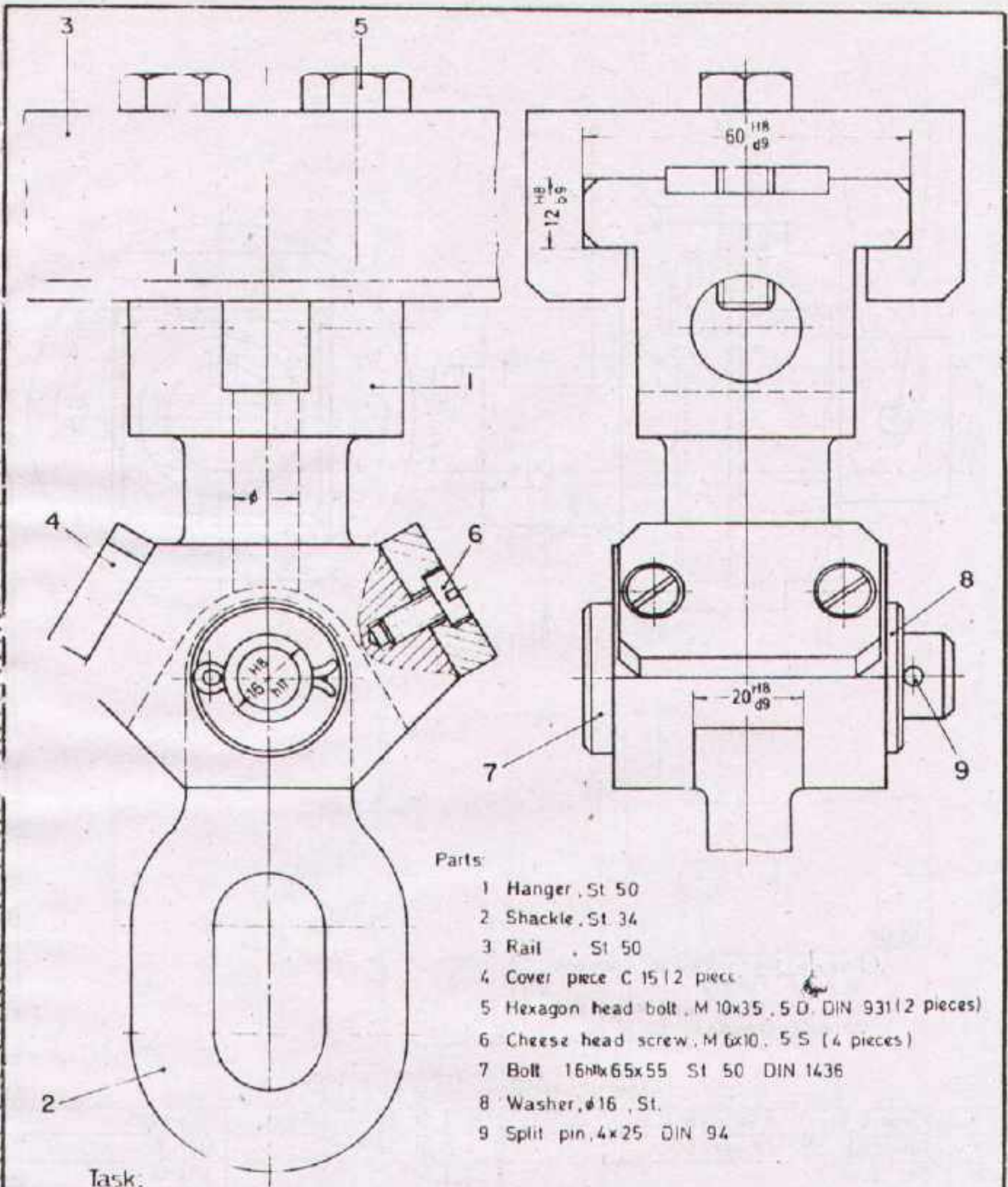
Drawn Name _____ Checked _____ Name _____
 Date Date _____ Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAX GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No 58



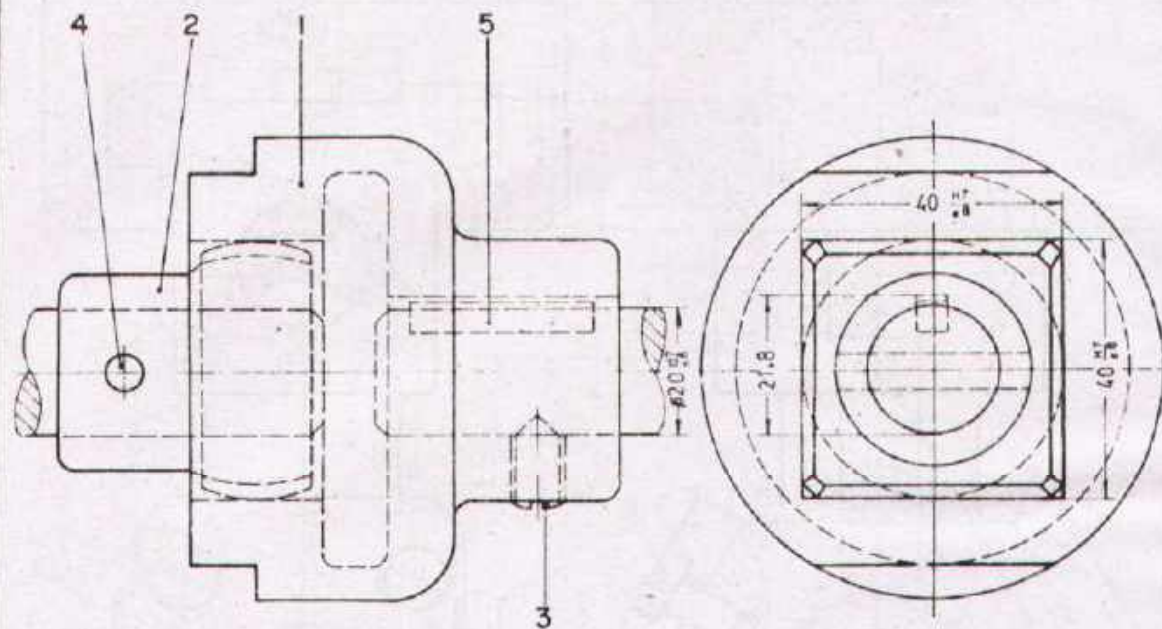
- Parts:
- 1 Hanger, St 50
 - 2 Shackle, St 34
 - 3 Rail, St 50
 - 4 Cover piece C 15 (2 piece)
 - 5 Hexagon head bolt, M 10x35, 5 D, DIN 931 (2 pieces)
 - 6 Cheese head screw, M 6x10, 5 S (4 pieces)
 - 7 Bolt 16Hx65x55, St 50, DIN 1436
 - 8 Washer, $\phi 16$, St.
 - 9 Split pin, 4x25, DIN 94

Task:

Part 1 has to be drawn in three views, side view in sectional representation.
 Enter ISO-fits and necessary dimensions, sizes are to be taken from the assembly drawing.
 Enter the surface symbols.

Note: Contact surface with part 3 fine finished, parts 2, 4, 7, 8 finished, all other surfaces rough.

Scale 1:1	HANGING SUPPORT		
Drawn	Name _____ Date _____	Checked _____	Name _____ Date _____
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING <small>PAK-GERMAN TECHNICAL TRAINING PROGRAMME</small>			Trade Practice 2 No. 59



Task:

Prepare the workshop drawings of parts 1 and 2
 Sizes are to be taken from the assembly drawing!

1	Parallel key	A 5x5x28	5	St. 60	DIN 6885
1	Cylindrical pin	6mmx28	4	St. 50 K	DIN 7
1	Set screw		3	5 S	DIN 553
1	Coupling half		2	GG-22	
1	Coupling half		1	GG-22	
No REQD	DESCRIPTION		PART No.	MATERIAL	STANDARD

Scale 1:1

COUPLING

Drawn

Name _____
 Date _____

Checked

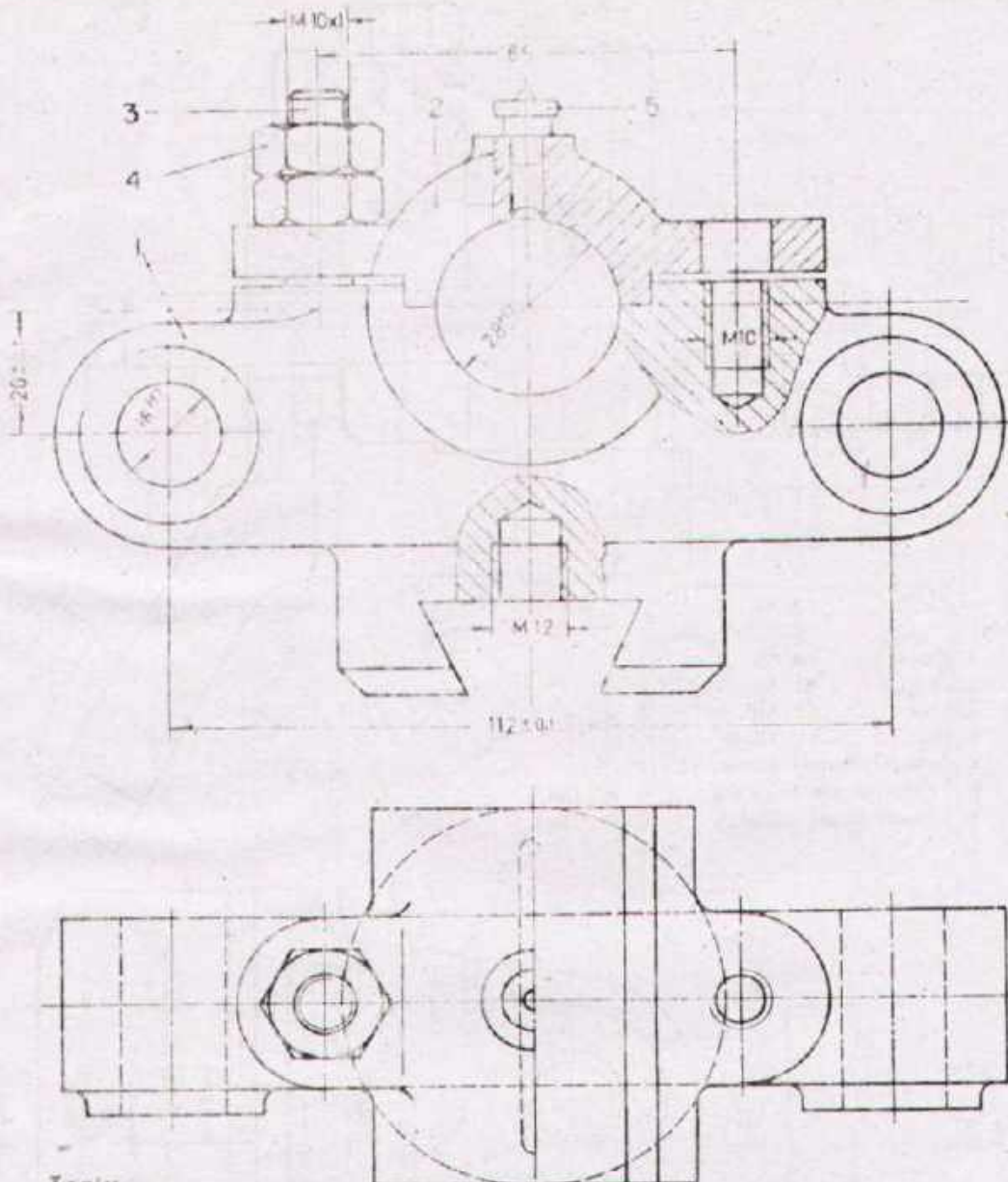
Name _____
 Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade
 Practice **2**
 No. 60



Task:

Prepare the workshop drawings of parts 1 and 2.
 Sizes are to be taken from the assembly drawing!

1	Flat lubrication nipple	B 6	5	St	DIN 3404
4	Hexagon nut	M10x1	4	S 8	DIN 934
2	Stud bolt	M10x1x30	3	S 8	DIN 833
1	Bearing cover		2	GG-22	
1	Bearing base		1	GG-22	
No. RECD	DESCRIPTION		PART No.	MATERIAL	STANDARD

Scale 1:1

BEARING WITH DOVETAIL BASE

Drawn

Name _____
 Date _____

Checked

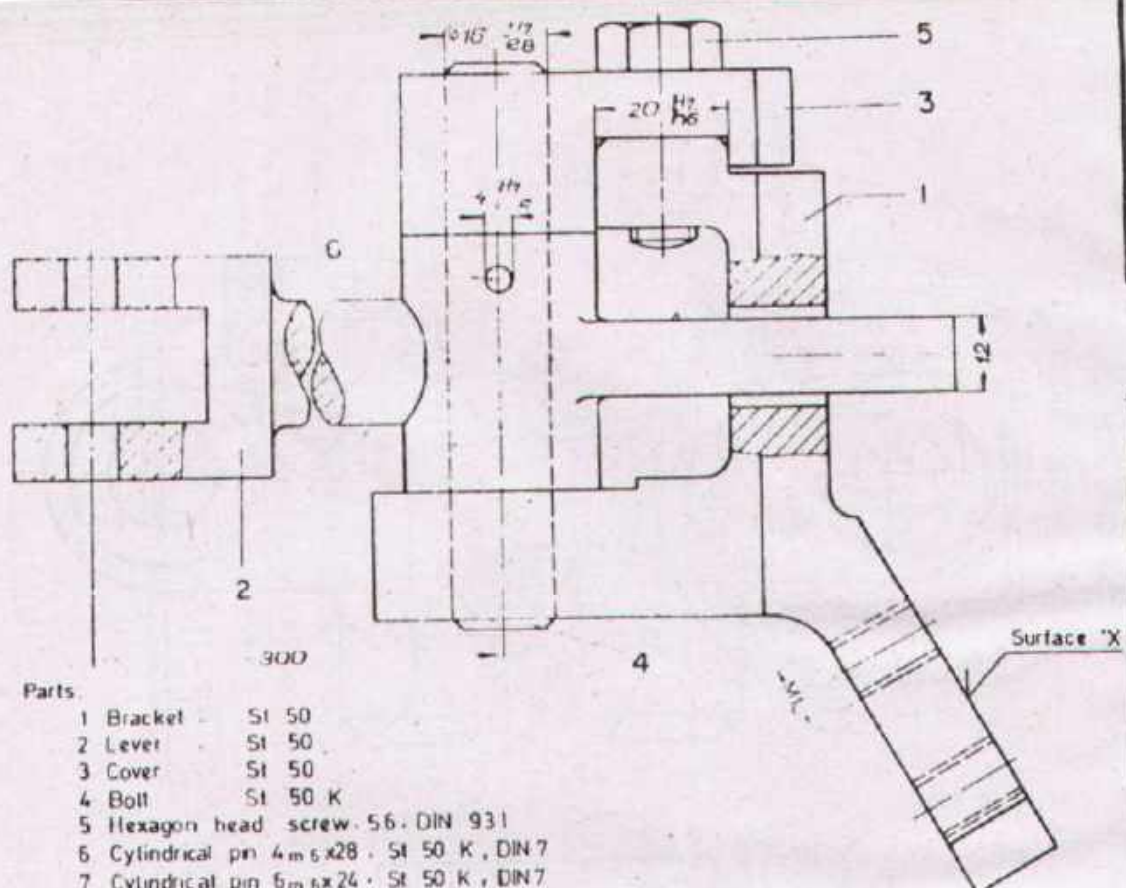
Name _____
 Date _____



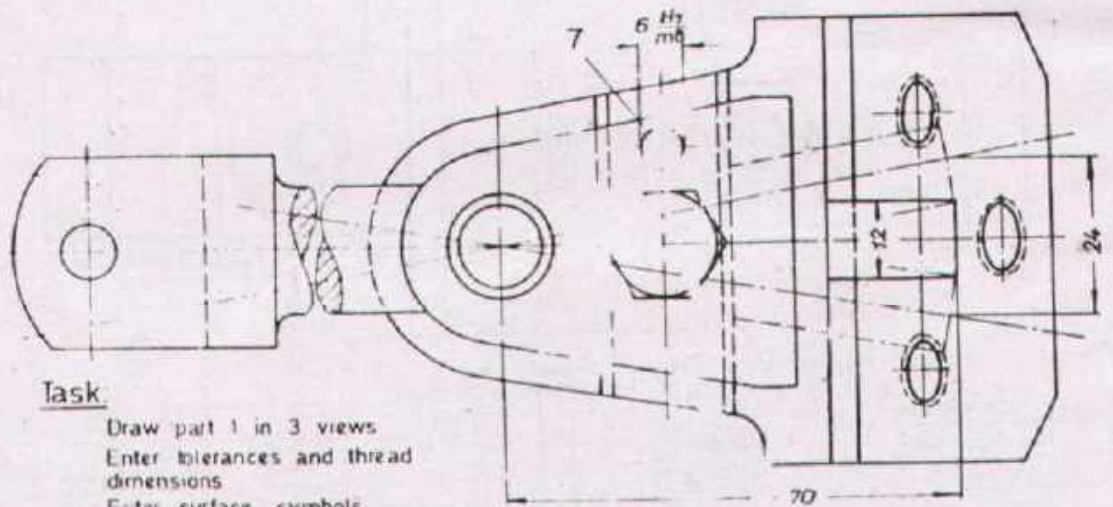
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No.61




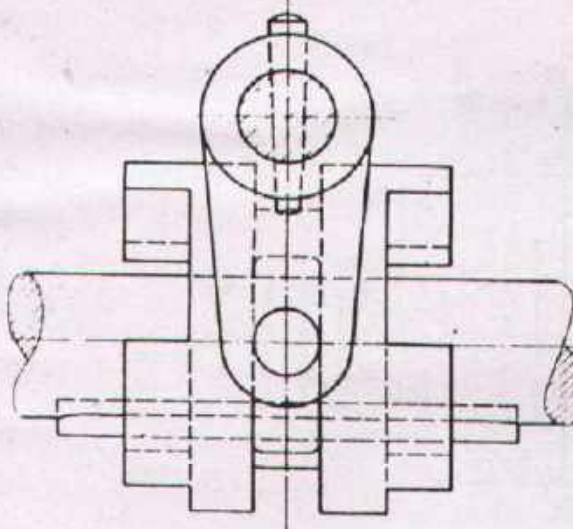
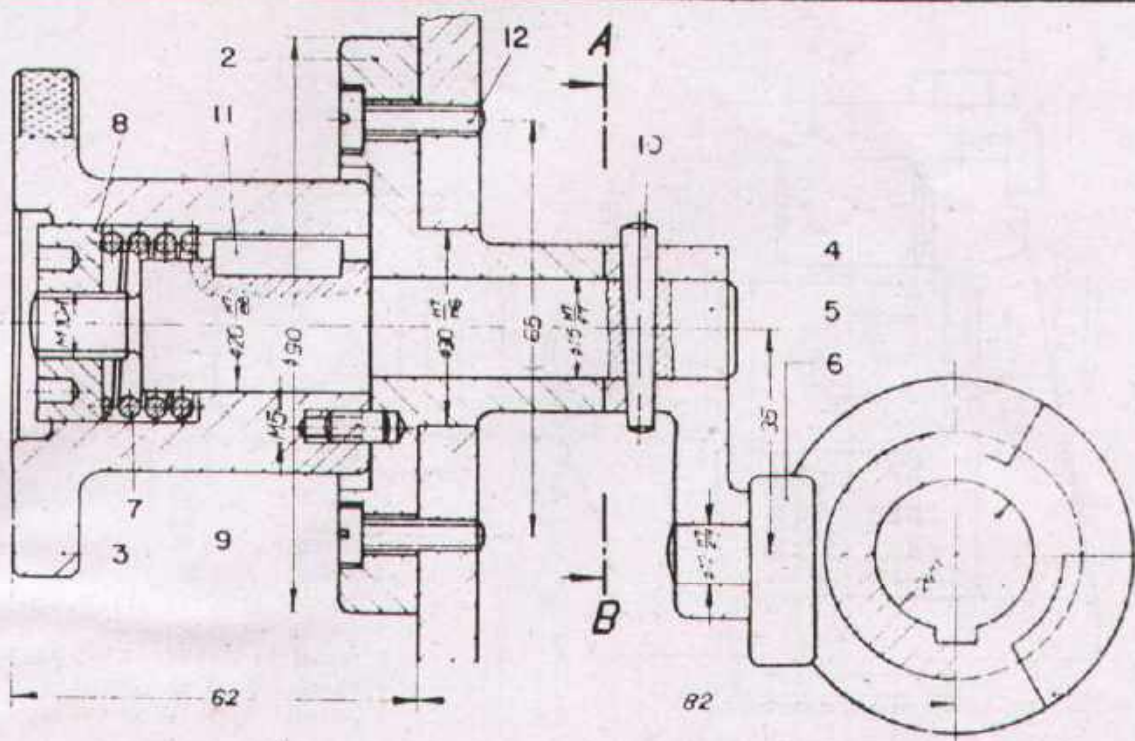
- Parts:
- 1 Bracket - St 50
 - 2 Lever - St 50
 - 3 Cover - St 50
 - 4 Bolt - St 50 K
 - 5 Hexagon head screw - 5.6 - DIN 931
 - 6 Cylindrical pin 4 m x 28 - St 50 K, DIN 7
 - 7 Cylindrical pin 6 m x 24 - St 50 K, DIN 7



Task
 Draw part 1 in 3 views
 Enter tolerances and thread dimensions
 Enter surface symbols

Note Contact surface with parts 2,3,4 fine finished
 Surface 'X' finished,
 all others roughed

Scale 1:1	GEAR SHIFT LUG		
Drawn	Name Date	Checked	Name Date
 DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING <small>PAR GERMAN TECHNICAL TRAINING PROGRAMME</small>			Trade Practice 2 No 62



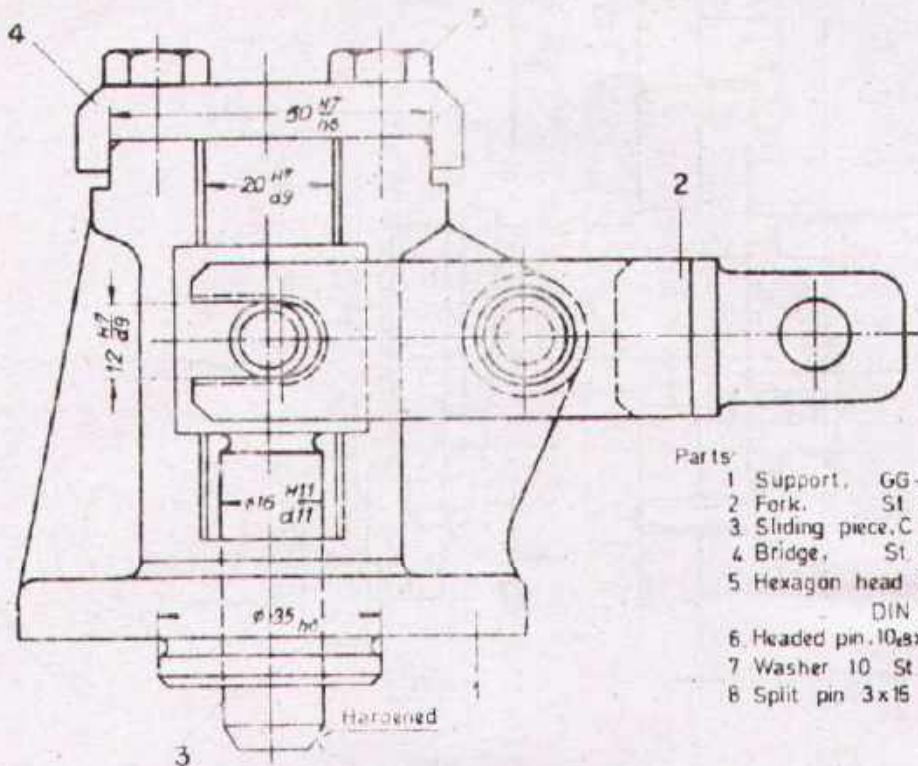
- 1 Coupling sleeve, C 15
- 2 Flange, St 50
- 3 Clutch release wheel, St 50
- 4 Lever, St 50
- 5 Shaft, St 60
- 6 Disconnecting block, C 15
- 7 Pressure spring, Spring steel
- 8 Two hole nut, St 50 DIN 547
- 9 Fixing pin, 5D
- 10 Taper pin 4x30, St 60, DIN 1
- 11 Parallel key A6x6x20, St 60, DIN 6085
- 12 Cheese head screw M6x18, 4D, DIN 84

The two different lever positions are achieved through shifting the coupling sleeve by 20 mm
 These positions are fixed by two cylindrical holes for inserting the fixing pin

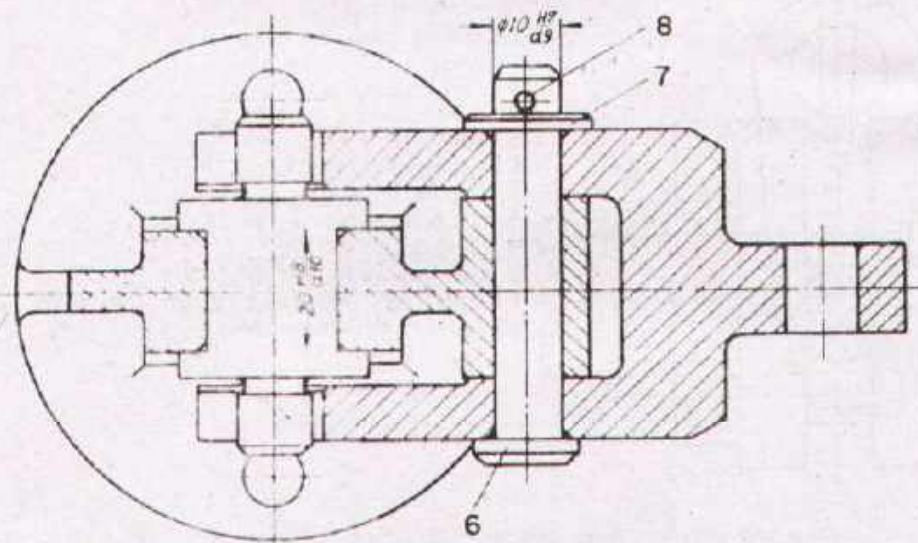
Task:

Prepare the workshop drawings of parts 1 to 6
 Sizes are to be taken from the assembly drawing!

Scale 1:1	UNCLUTCHING DEVICE		
Draw	Name _____ Date _____	Checked _____	Name _____ Date _____
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING PAK GERMAN TECHNICAL TRAINING PROGRAMME			Trade Practice 2 No 63



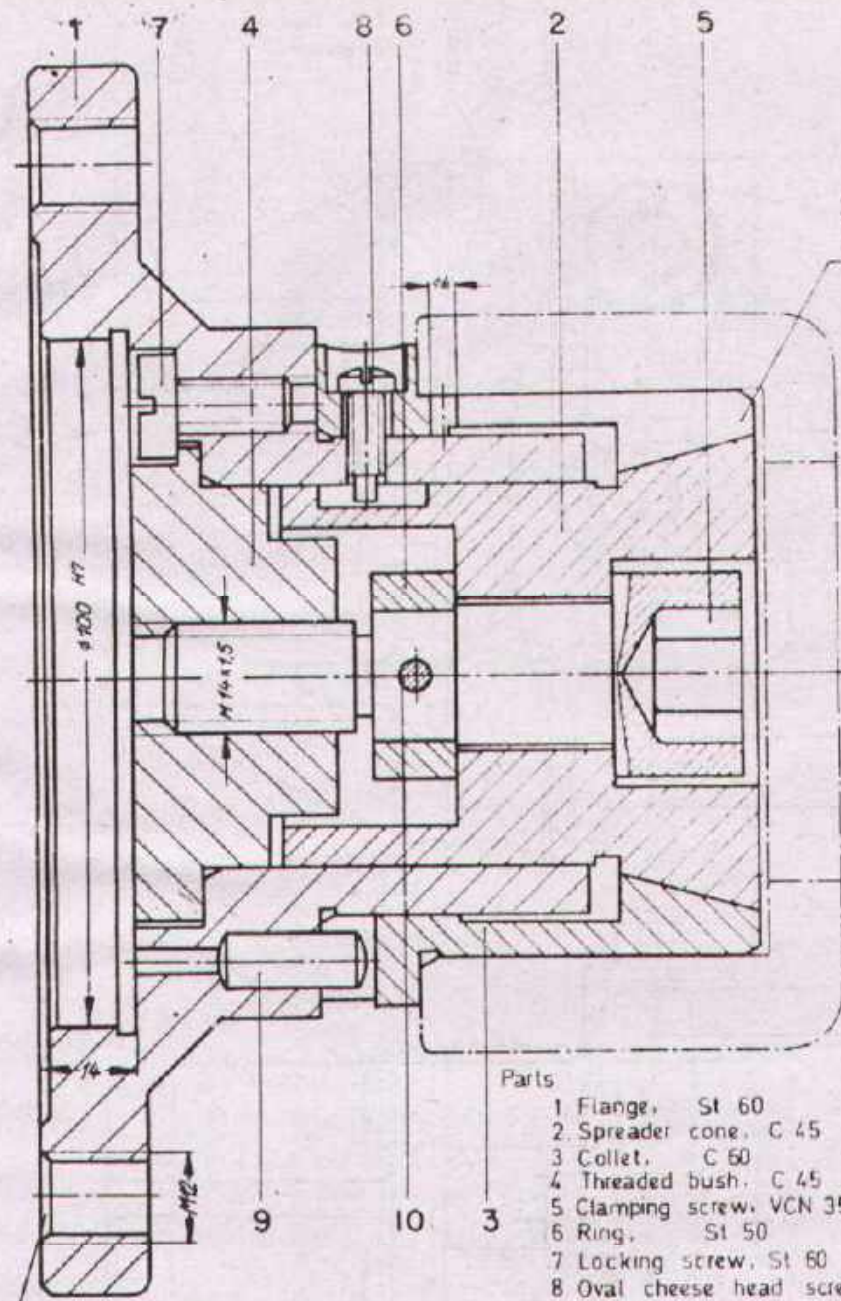
- Parts:
- 1 Support, GG-22
 - 2 Fork, St 50
 - 3 Sliding piece, C 15
 - 4 Bridge, St 50
 - 5 Hexagon head bolt, M8x15.8 G, DIN 931
 - 6 Headed pin, 10,8x58x53, St 50-DIN 1435
 - 7 Washer 10 St 33 DIN 1440
 - 8 Split pin 3x15 St 33 DIN 94



Task:

Prepare the workshop drawings of parts 1 to 4. Sizes are to be taken from the assembly drawing!

Scale 1:1	STRAIGHT MOTION GUIDE		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING <small>FAK GERMAN TECHNICAL TRAINING PROGRAMME</small>			Trade Practice 2 No 64



3 Slots on the circumference, width 3 mm

4 Holes on the circumference

Parts

- 1 Flange, St 60
- 2 Spreader cone, C 45
- 3 Collet, C 60
- 4 Threaded bush, C 45
- 5 Clamping screw, VCN 35 W
- 6 Ring, St 50
- 7 Locking screw, St 60
- 8 Oval cheese head screw, M6x12, 8G, DIN 922
- 9 Cylindrical pin, B_{m 6} x 18, St 50 K, DIN 7
- 10 Grooved dowel pin, 5x28, 6S, DIN 1473

The clamping device shown in the above drawing is used for turning the bush, indicated by dash and dot lines

Task:

Prepare the workshop drawings of parts 1 to 7
 Sizes are to be taken from the assembly drawing!

Scale 1:1	CLAMPING DEVICE		
-----------	------------------------	--	--

Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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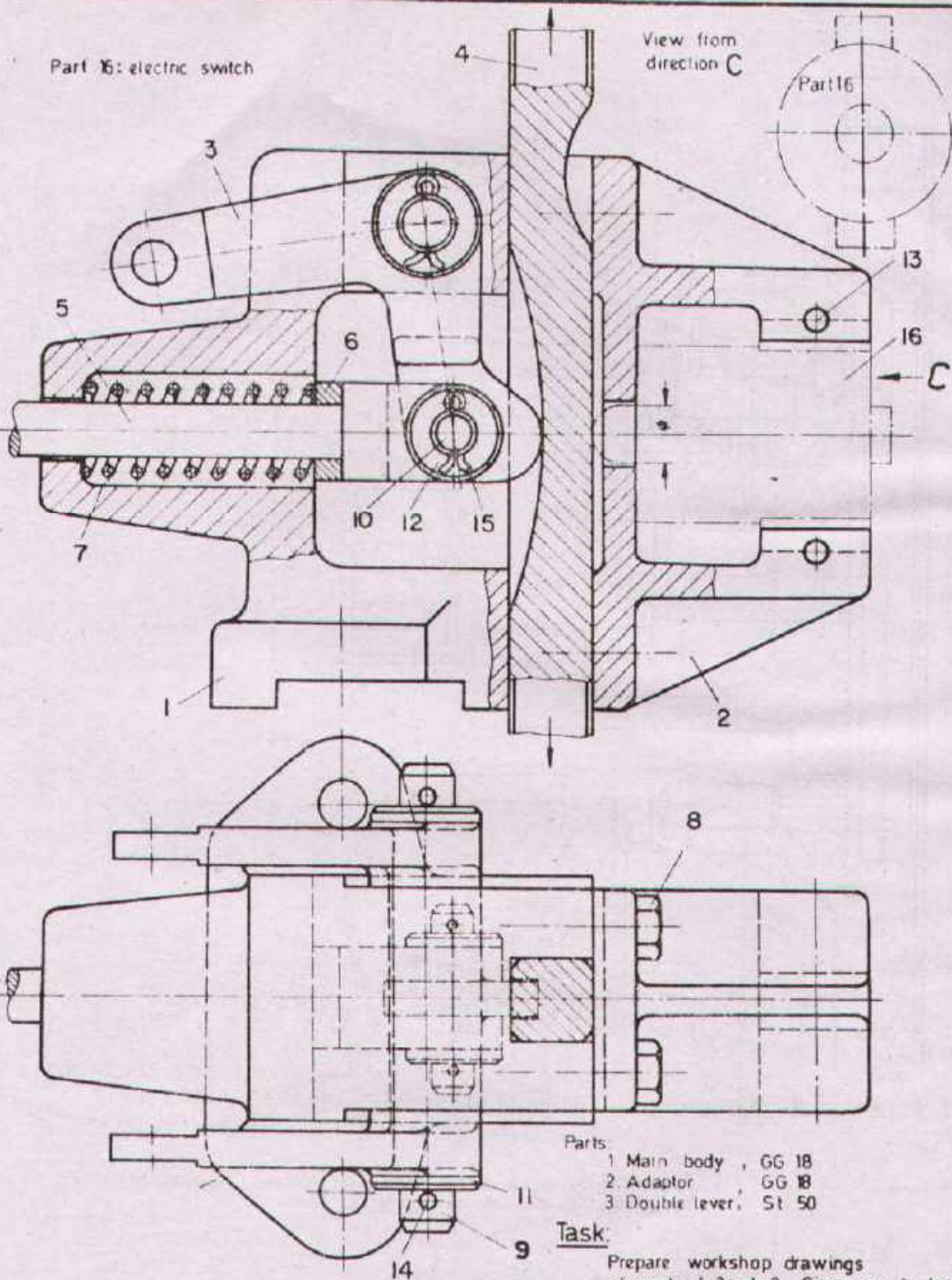


DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No.65

Part 16: electric switch



- Parts:
- 1 Main body, GG 18
 - 2 Adaptor, GG 18
 - 3 Double lever, St 50

Task:
 Prepare workshop drawings of parts 1, 2 and 3. Sizes are to be taken from the assembly drawing!

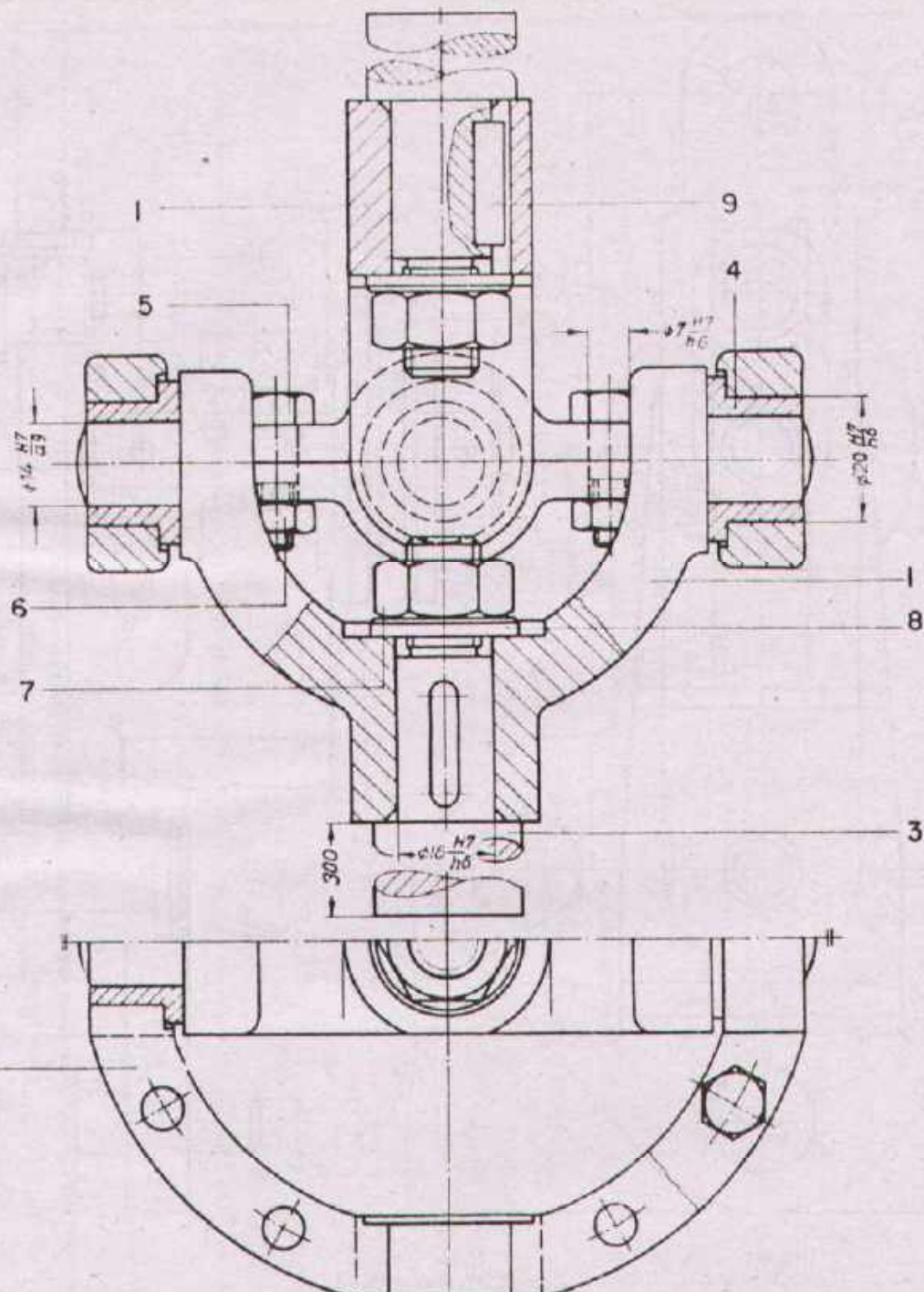
Scale 1:1	SWITCH		
Drawn	Name _____ Date _____	Checked	Name _____ Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
 No 66



Parts:

- | | |
|---|---|
| 1. Bracket, GTW 40 (2 pieces) | 7 Hexagon nut, M12, 5S, DIN 934 (2 pieces) |
| 2. Ring, GTW 40 (2 pieces) | 8 Washer, 13, St., DIN 125 (2 pieces) |
| 3. Shaft, St. 50 (2 pieces) | 9 Parallel key, St. 60, DIN 5885 (2 pieces) |
| 4. Bush, GBz 14 (4 pieces) | |
| 5. Fitting bolt, 8 G (8 pieces) | |
| 6 Hexagon nut, M5, 5S, DIN 934 (8 pieces) | |

Task:

Prepare workshop drawings of parts 1 to 4.
Sizes etc. to be taken from the assembly drawing.

Scale 1:1 **CROSS JOINT**

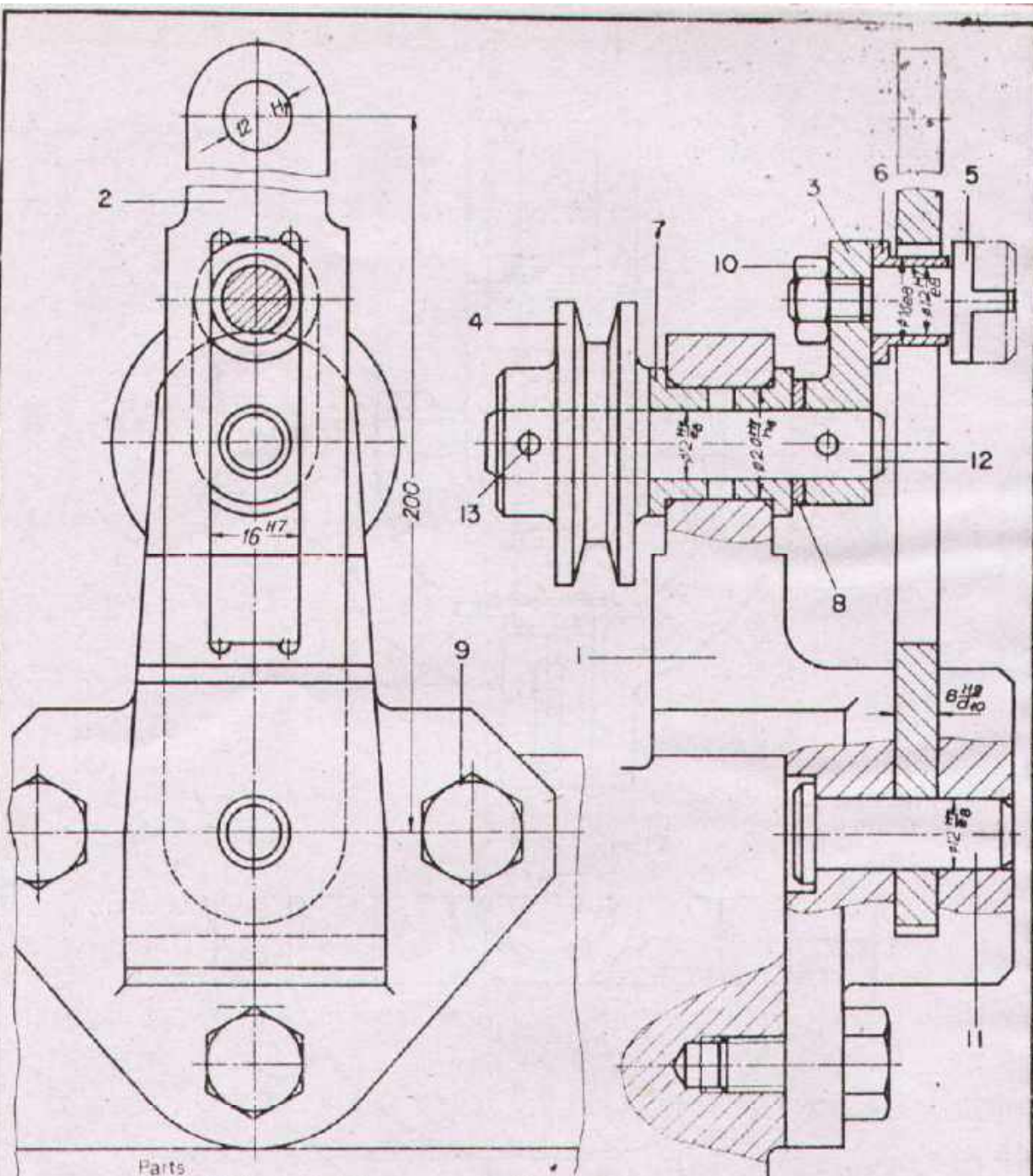
Drawn	Name _____ Date _____	Checked	Name _____ Date _____
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAX GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 67



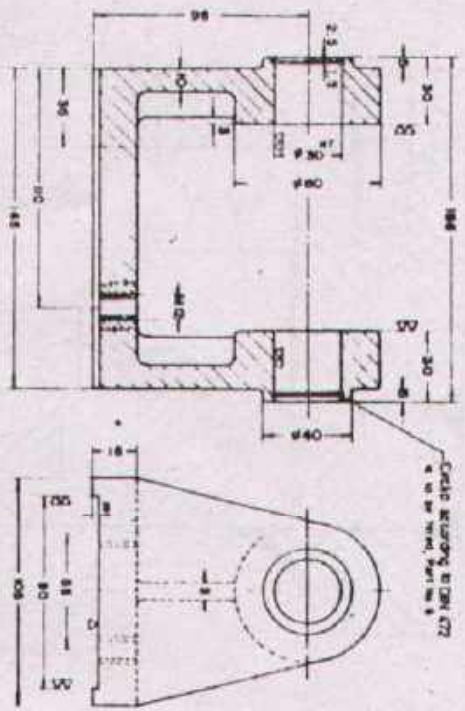
Parts

- | | |
|----------------------|---|
| 1 Bracket, St 50 | 7 Bush, Rg 5 |
| 2 Rocker arm, C 15 | 8 Washer, M's 63 |
| 3 Crank, St 50 | 9 Hexagon head bolt, M10x24, SD, DIN 931 (3 pieces) |
| 4 Vee-pulley, St 50 | 10 Hexagon nut, M8, 5S, DIN 934 |
| 5 Sliding pin, St 50 | 11 Bolt, 12 x 35, St 50, DIN 1434 |
| 6 Bush, Rg 5 | 12 Bolt, 12 x 70, St 50, DIN 1433 |
| | 13 Taper pin, 4x28, St 50 K, DIN 1 |

Task:

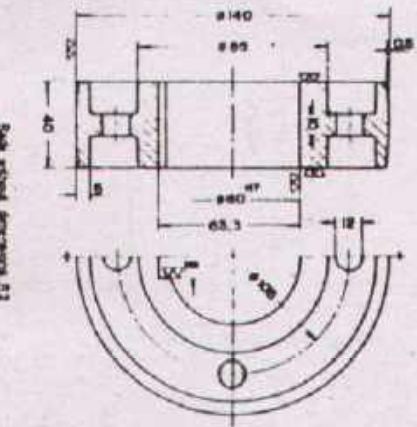
Prepare complete workshop drawings of parts 1 to 7 (part 1 in three views).
 Sizes are to be taken from the assembly drawing!

Scale 1:1	SLIDING PIN DRIVE		
Drawn	Name Date	Checked	Name Date
DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING		Trade Practice 2 No. 68	



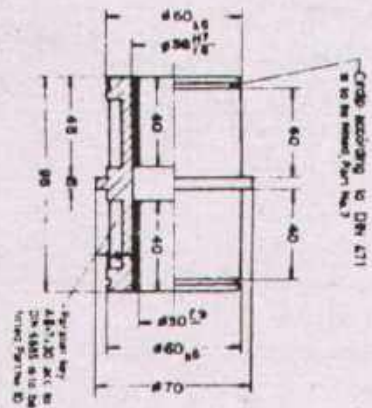
1 - BODY ~ (▽, ▽)

Scale: actual dimensions 1:1



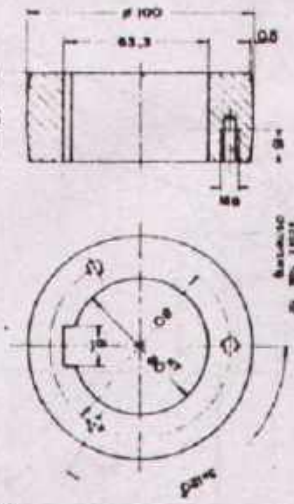
5 - FLAT PULLEY ~ (▽▽)

Scale: actual dimensions 1:1



3,6 - HOLLOW SHAFT BUSH

▽▽



4 - FLAT PULLEY ▽▽



2 - AXLE ▽▽

Scale: actual dimensions 1:1

Task

Prepare the assembly drawing of the BELT DRIVE (transmission unit) in following views:
 1 Full section & section view } Scale 1:2,5
 2 Side view
 Prepare the list of parts according to standard

BELT DRIVE

TRANSMISSION UNIT

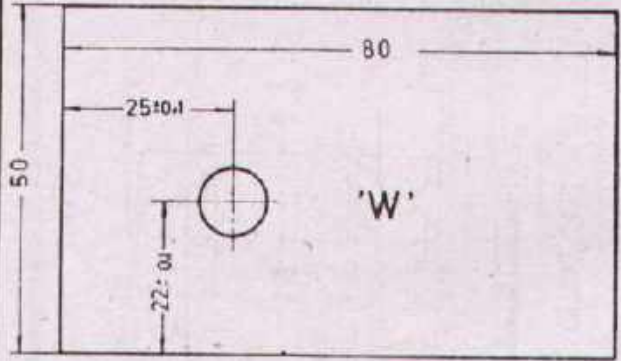
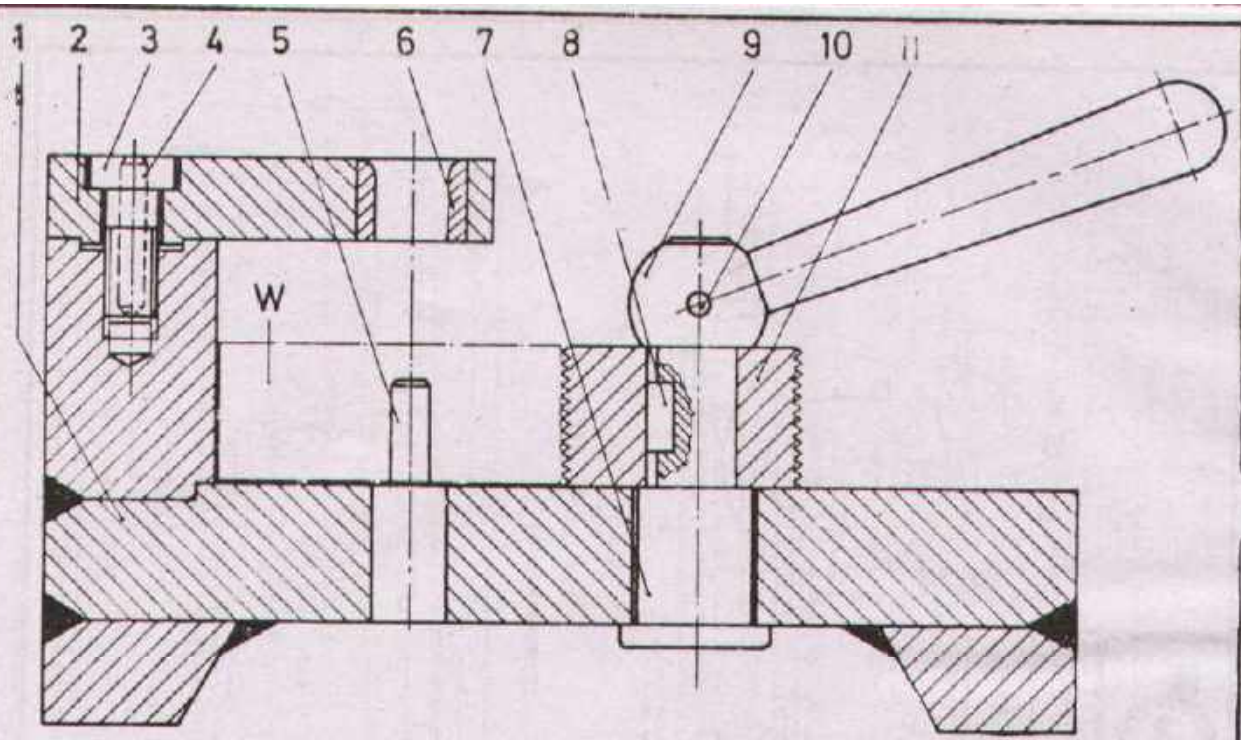
Scale	Name	Checked	Name
Drawn	Date		Date

DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No.69

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



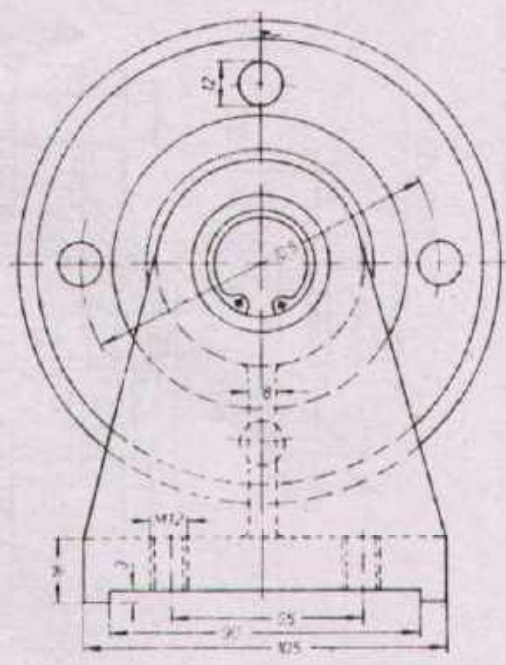
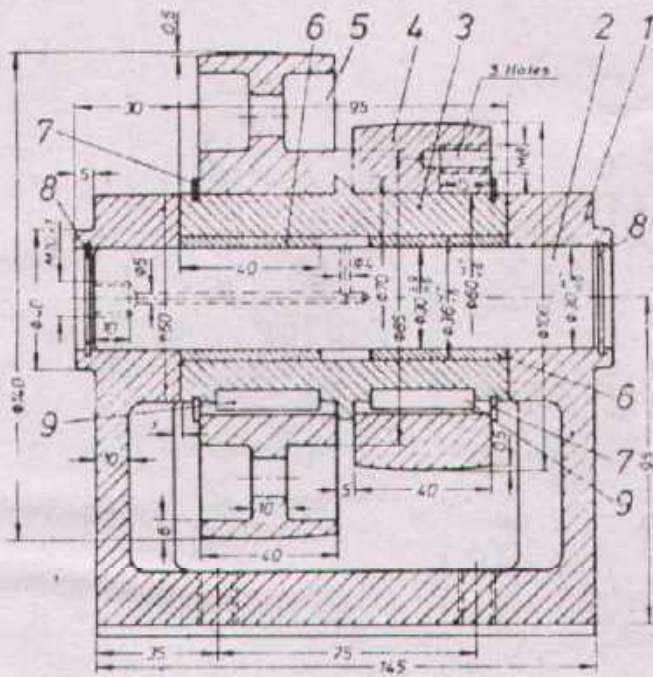
Task

From the given idea and workpiece 'W' construct a drilling device.
 Prepare assembly and detail drawings (except standard parts).
 Enter the necessary dimensions!

| | | | | |
|----------|--------------------------|---------|----------|----------|
| 1 | Eccentric threaded piece | 11 | St 37 | |
| 1 | Cylindrical pin 3x20 | 10 | St 50 | DIN 7 |
| 1 | Lever | 9 | St 37 | DIN 99 |
| 1 | Parallel key | 8 | St. 50 | DIN 6835 |
| 1 | Bolt | 7 | A. 50 | |
| 1 | Boring bush | 6 | C St. | DIN 179 |
| 1 | Cylindrical pin 6x25 | 5 | St. 50 | DIN 7 |
| 1 | Cylindrical pin 4 x 25 | 4 | St. 50 | DIN 7 |
| 2 | Socket head screw M10x20 | 3 | 8.8 | DIN 7984 |
| 1 | Guide plate | 2 | St. 37 | |
| 1 | Body | 1 | St. 37 | |
| No. REQD | DESCRIPTION | PART No | MATERIAL | STANDARD |

Scale 1:1 **DRILLING DEVICE**

| | | | |
|-------|--------------------------|---------|--------------------------|
| Drawn | Name _____
Date _____ | Checked | Name _____
Date _____ |
|-------|--------------------------|---------|--------------------------|



Task:

1. List down the required operations when assembling the transmission


2. Prepare complete workshop drawings of all parts (except standard parts)
3. Change the floor frame into a welding construction.
4. Change the design of the two pulleys in such a way that they run directly on the axle (without part 3 but with part 6). The central web of the bigger pulley is left away and replaced by a flange type disk at the right hand side of that pulley which the two pulleys can be screwed together. The bigger pulley has to be designed with ribs between hub and rim.

| | | | | | |
|-----------|--------------|-------------------|---------|----------|----------|
| 2 | Parallel key | A8 x7 x 30 | 9 | St 60 | DIN 6885 |
| 2 | Circlip | 30 x 1,2 | 8 | St | DIN 472 |
| 2 | Circlip | 60 x 2 | 7 | St | DIN 471 |
| 2 | Bush | A30 E9/36 r6 x 40 | 6 | G CuSn12 | DIN 1850 |
| 1 | Belt pulley | φ 140 | 5 | GS-38 | |
| 1 | Belt pulley | φ 100 | 4 | St 37 | |
| 1 | Hollow shaft | | 3 | St 37 | |
| 1 | Axle | | 2 | C 60 K | |
| 1 | Floor frame | | 1 | GS-38 | |
| No. REQD. | DESCRIPTION | | PART No | MATERIAL | STANDARD |

Scale 1:2.5

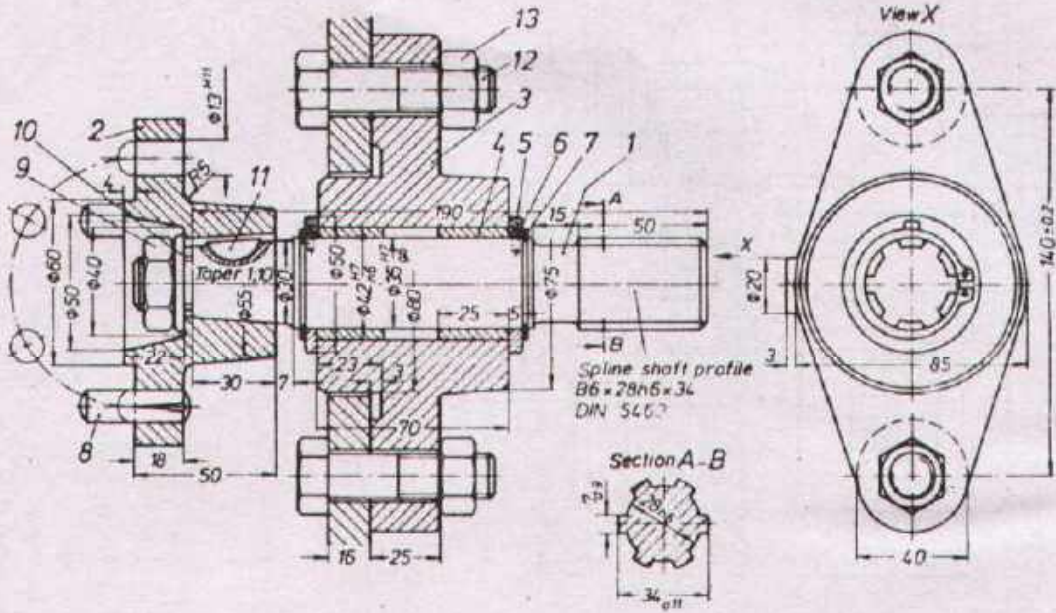
TRANSMISSION FOR BELT DRIVE

| | | | |
|-------|--------------------------|---------|--------------------------|
| Drawn | Name _____
Date _____ | Checked | Name _____
Date _____ |
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 71



Task:

- Prepare the detail drawings of all parts (except standard parts).
- Enter the necessary dimensions!
- Fill the list of parts according to standard

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| | | | | |
| No. REQD | DESCRIPTION | PART No. | MATERIAL | STANDARD |

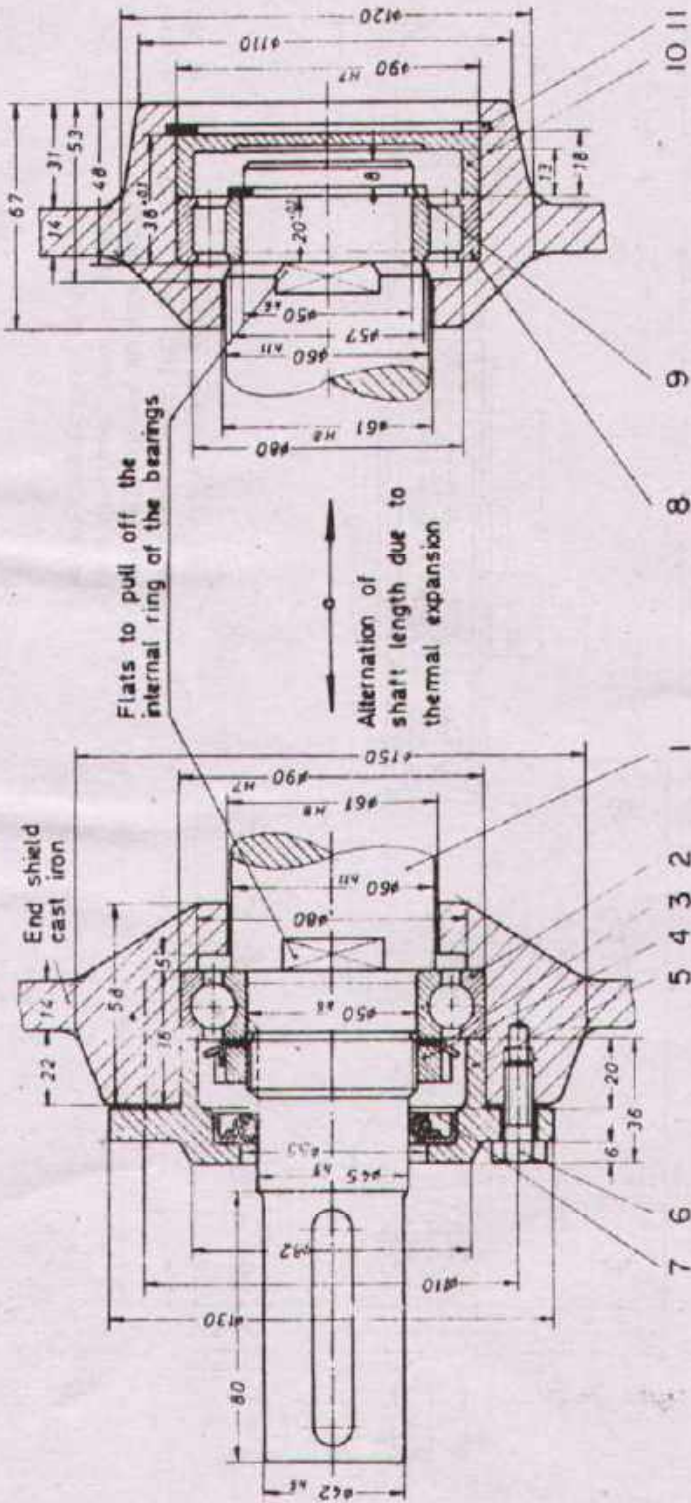
| | | | | |
|-------------|---|---------|--------------------------|--|
| Scale 1:2,5 | COUPLING SHAFT WITH FLANGE BEARING | | | |
| Drawn | Name _____
Date _____ | Checked | Name _____
Date _____ | |



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

Trade Practice **2**
No. 72




Floating bearing
DIN 5412 Series NU 2

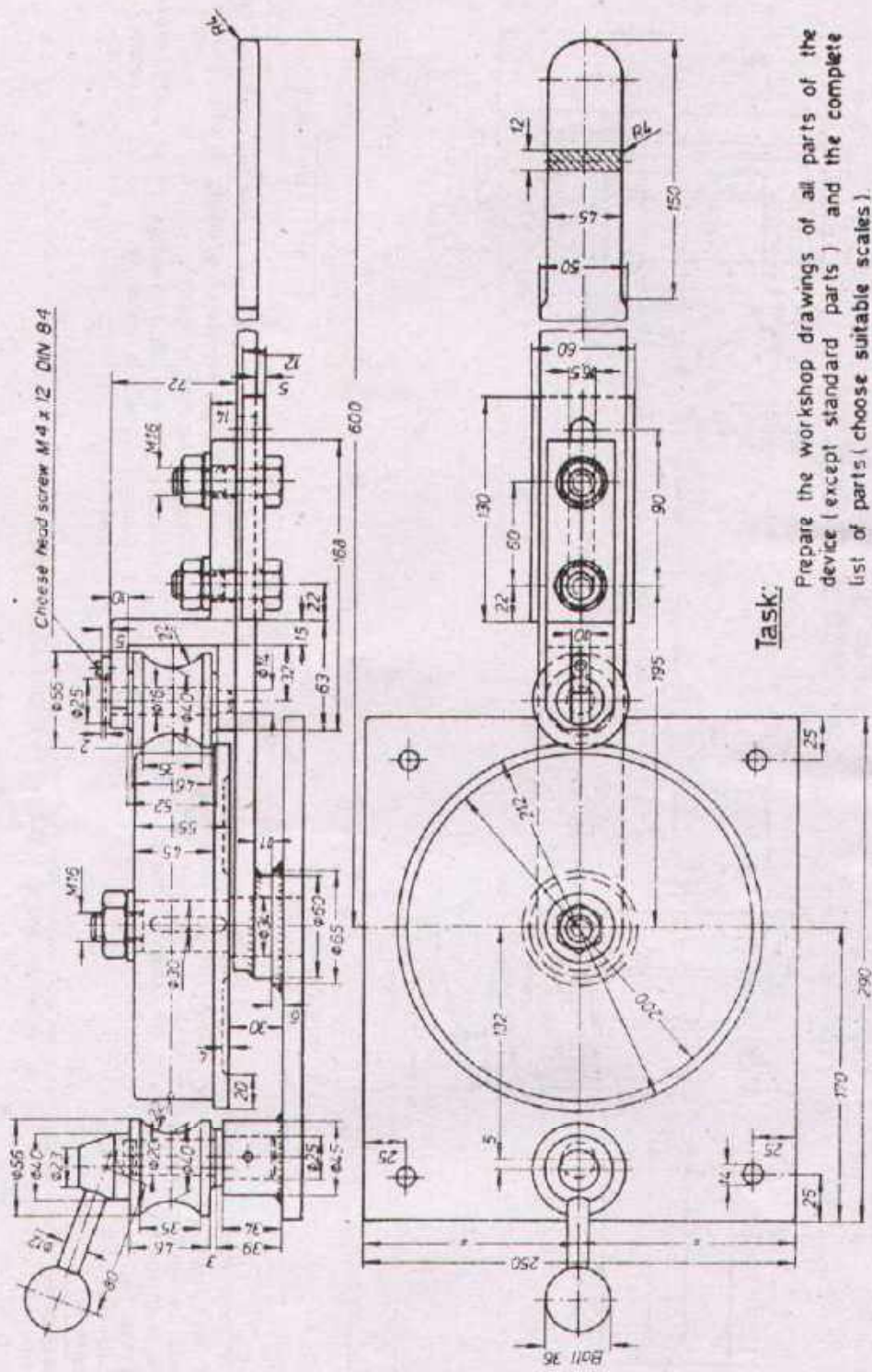
Task:

- 1 Prepare assembly drawings of the two bearings units, scale 1:1 (without dimensions) according to the given sizes
- 2 Prepare the list of parts.
- 3 Prepare the workshop drawings of all parts (except standard parts) in as many views as necessary, scale 1:1.

Are more than one roller bearings fixed on one shaft, only one of them must be a locating bearing. All the remaining bearings must be floating bearings to allow for the axial extension of the shaft. In the above design the shaft is fixed by the Deep groove ball bearing. The cylindrical roller bearing permits the axial extension of the shaft.

Parts of the locating bearing:
 1. Deep groove ball bearing (hole in the end plate with tolerance H7)
 2. shaft nut, locking ring, bearing cover (GG-20), seal B 45x72x8 DIN 3760 Hexagon head screws.
 3. Parts of the floating bearing:
 4. Cylindrical roller bearing (holes also H7) circlip, cover

| | | | |
|---|---------------------------|-----------------------------------|--------------------------|
| Scale | BEARING OF ELECTRIC MOTOR | | |
| Drawn | Name _____
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Date _____ |
|  DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME | | Trade Practice 2
No. 73 | |



Task:

Prepare the workshop drawings of all parts of the device (except standard parts) and the complete list of parts (choose suitable scales). Missing dimensions have to be added, standard denominations to be found out.

BENDING DEVICE
FOR HALF OVAL STEEL 35x10 DIN 1018

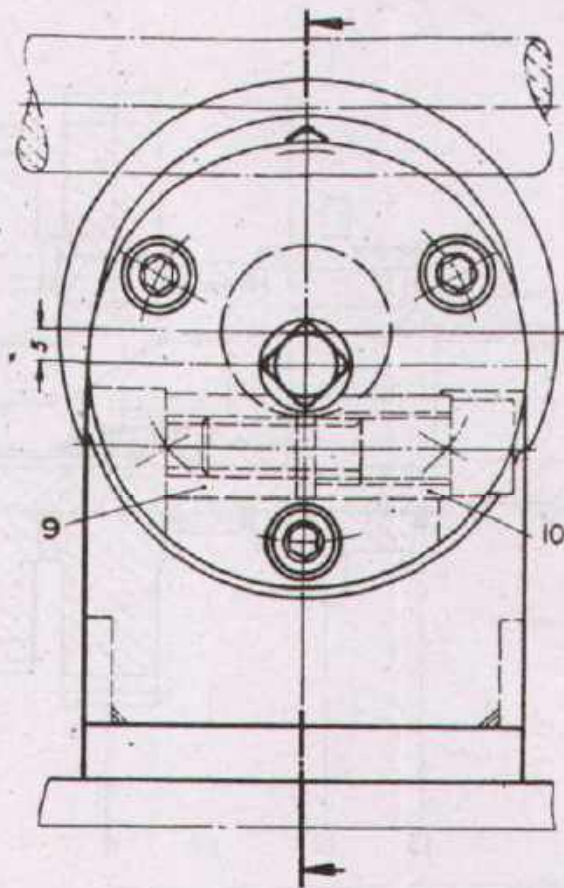
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK GERMAN TECHNICAL TRAINING PROGRAMME


Trade Practice **2**
No. 74

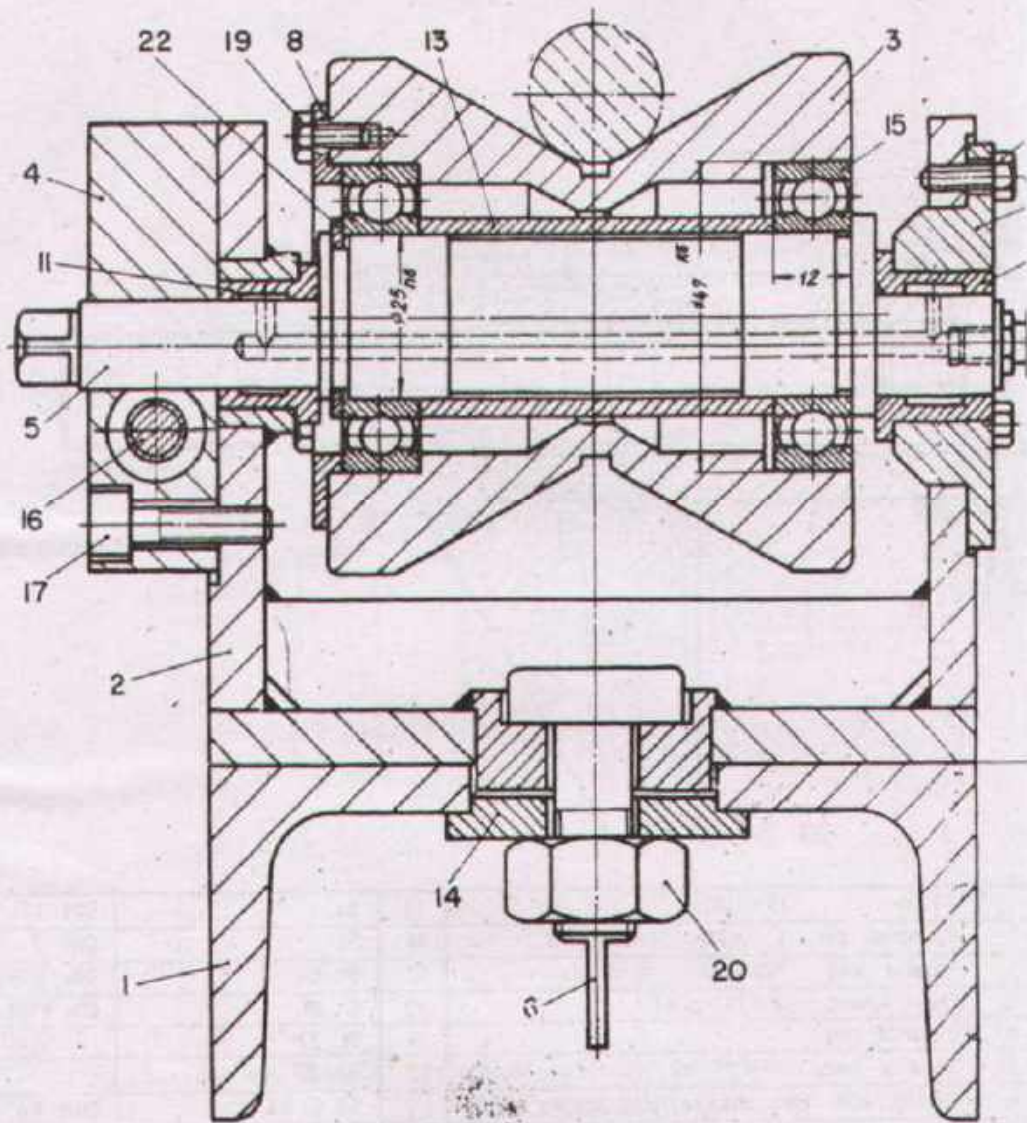


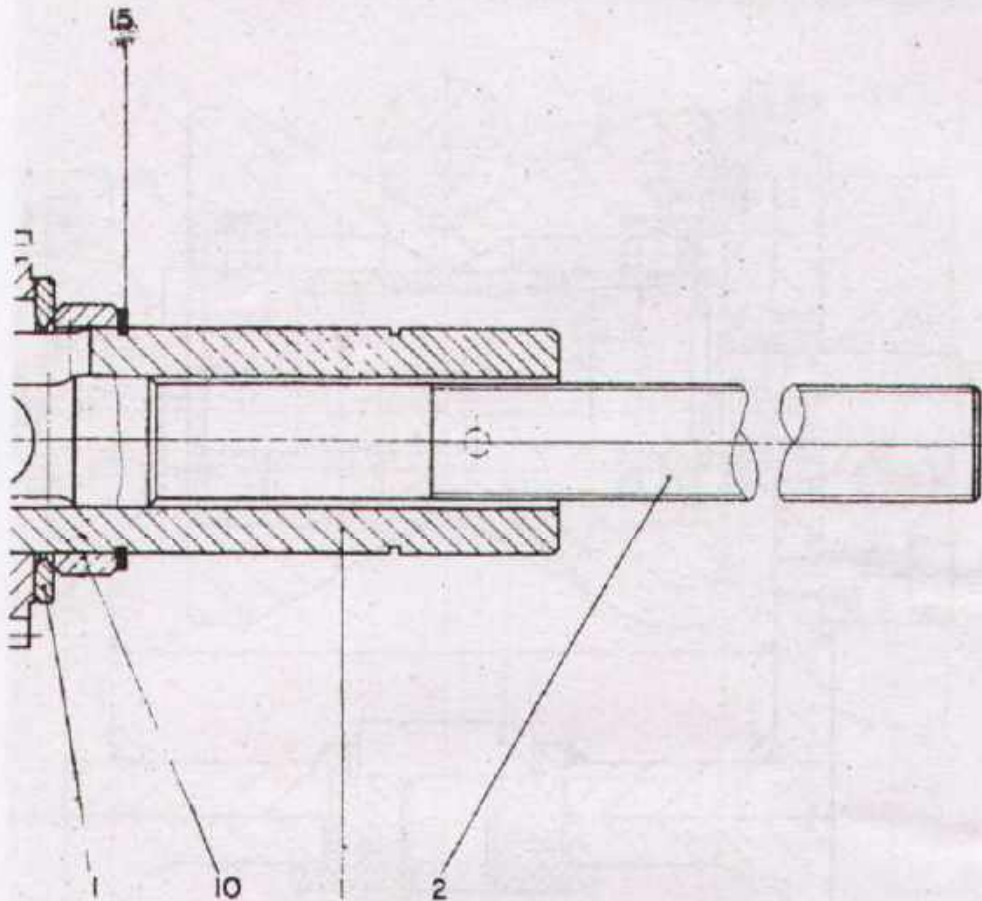
Along with the supporting beam (part 1) 14 roller blocks form a roller conveyor, which transports rods of 20 to 80 mm ϕ . The level of the rollers (part 3) can be adjusted by means of the eccentric axle (part 5). The clamping screw (part 6) is inserted from below and locked in the shown position. Its head and the through hole in part 2 have to be shaped accordingly.

Task:

Prepare the workshop drawings of parts 2 to 10. Sizes are to be taken from the assembly drawing!

| | | | |
|--|--------------------------|---------|-----------------------------------|
| ROLLER BOCK | | | |
| Drawn | Name _____
Date _____ | Checked | Name _____
Date _____ |
|  DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING
PAK-GERMAN TECHNICAL TRAINING PROGRAMME | | | Trade Practice 2
No. 75 |





| | | | | | |
|---------|------------------------------------|------------------|---------|----------|----------|
| 1 | Cirdip | 35 x 1,5 | 15 | St. | DIN 471 |
| 1 | Cylindrica pin | 6 x 20 | 14 | St. | DIN 7 |
| 1 | Parallel key | 19 x 6 x 22 | 13 | St 60 | DIN 6885 |
| 1 | Chain wheel | $z = 14$ $p =$ | 12 | C 18 | DIN 8196 |
| 6 | Distance ring | | 11 | St 37 | |
| 2 | Distance ring | | 10 | St 37 | |
| 1 | Spring with two cheese head screws | M4x6 | 9 | 58 Cr V4 | DIN 84 |
| 1 | Gear | $m = 2$ $z = 30$ | 8 | C 15 | |
| 1 | Gear | $m = 2$ $z = 35$ | 7 | C 15 | |
| 1 | Gear | $m = 2$ $z = 39$ | 6 | C 15 | |
| 1 | Gear | $m = 2$ $z = 40$ | 5 | C 15 | |
| 1 | Gear | $m = 2$ $z = 45$ | 4 | C 15 | |
| 1 | Driving key | | 3 | St 60 | |
| 1 | Gear - shift - shaft | | 2 | C 110 W1 | |
| 1 | Hollow shaft | | 1 | C 110 W1 | |
| No REQD | DESCRIPTION | | PART No | MATERIAL | STANDARD |

Scale 1:1

DRIVING KEY TYPE TRANSMISSION

Drawn

Name _____
Date _____

Checked

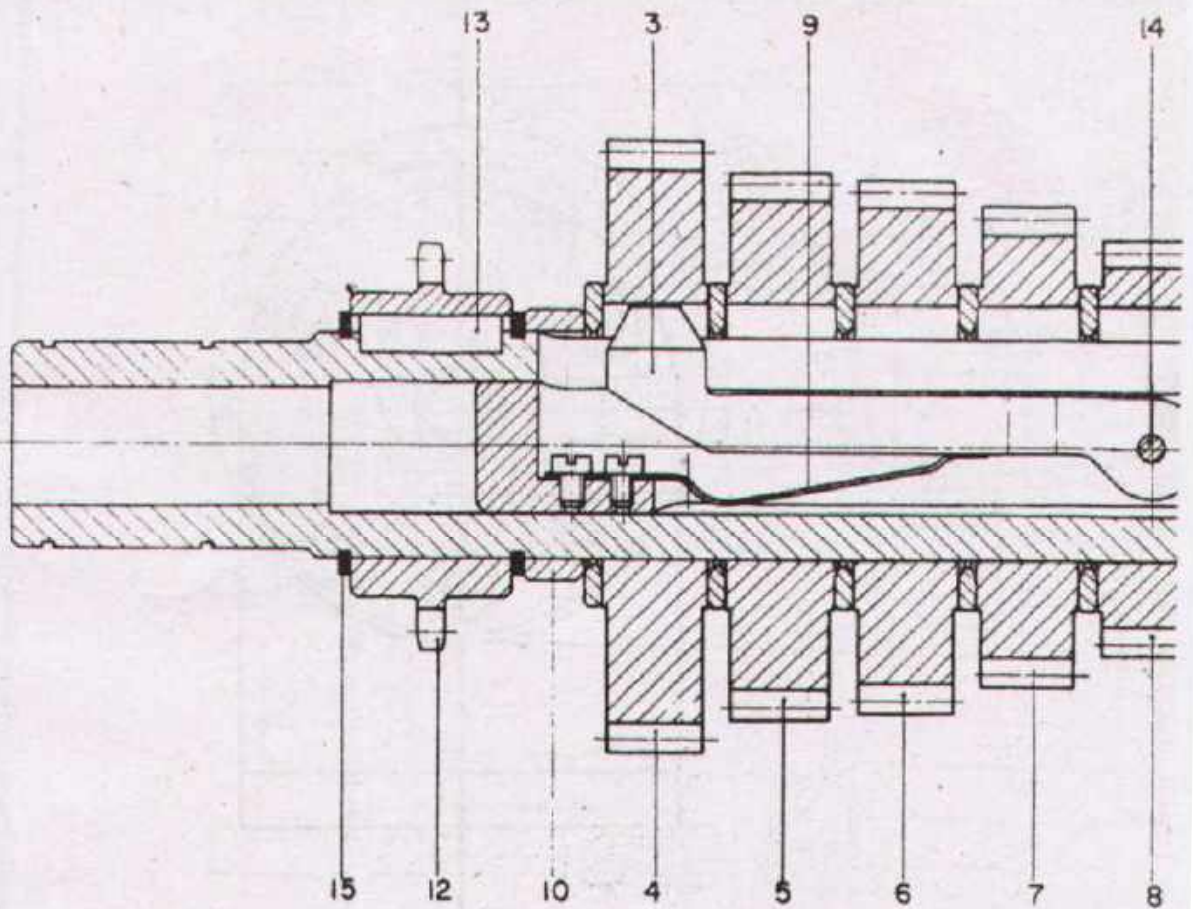
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Date _____



DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

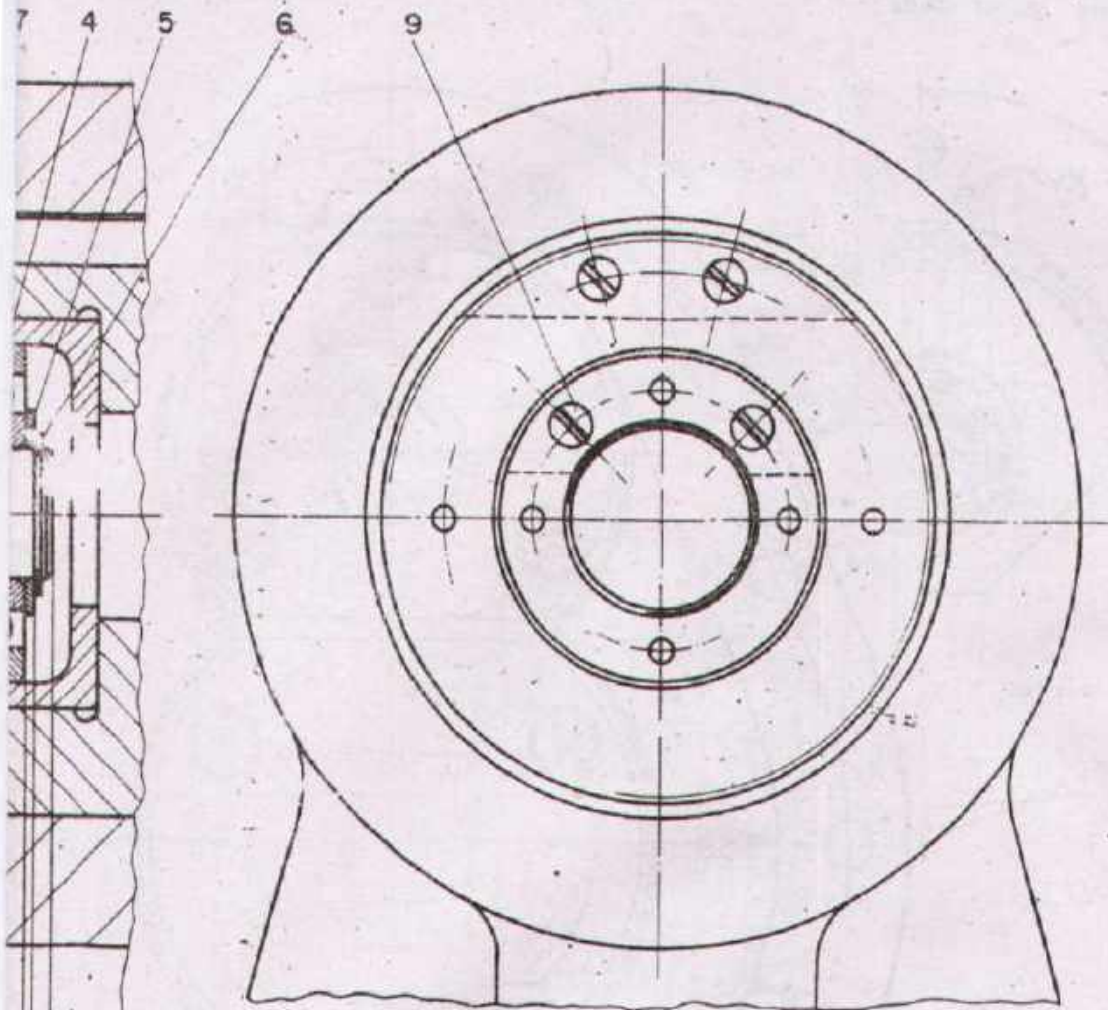
Trade Practice **2**
No. 76



Task:

- 1 Describe the functioning of the Driving key type transmission:

- 2 Prepare the workshop drawings of parts 1,2,3,7,12 (scale 1:1)
Dimensions to be taken: from the drawing, the list of parts and from tables.



| | | | | |
|-------------|---------------------------------------|-------------|------------|----------|
| 1 | Distance ring | 12 | St 42 | |
| 2 | Felt seal | 11 | Felt | |
| 1 | 4 Hole nut | 10 | St 42 | |
| 4 | Countersunk head screw M8x 20 | 9 | 5 S | DIN 87 |
| 1 | Clamping nut | 8 | St 42 | |
| 1 | Bush | 7 | St 42 | |
| 1 | Circlip 50x1,5 | 6 | | DIN 471 |
| 1 | Washer | 5 | St 37 | |
| 1 | Deep groove ball bearing 6410 | 4 | | DIN 625 |
| 1 | Spherical roller thrust bearing 29415 | 3 | | DIN 729 |
| 2 | Tapered roller bearing 32316 | 2 | | DIN 720 |
| 1 | Live center | 1 | 42 Cr Mo 4 | |
| No
REQD. | DESCRIPTION | PART
No. | MATERIAL | STANDARD |

Scale 1:2.5

LIVE CENTER

Drawn

Name
Date

Checked

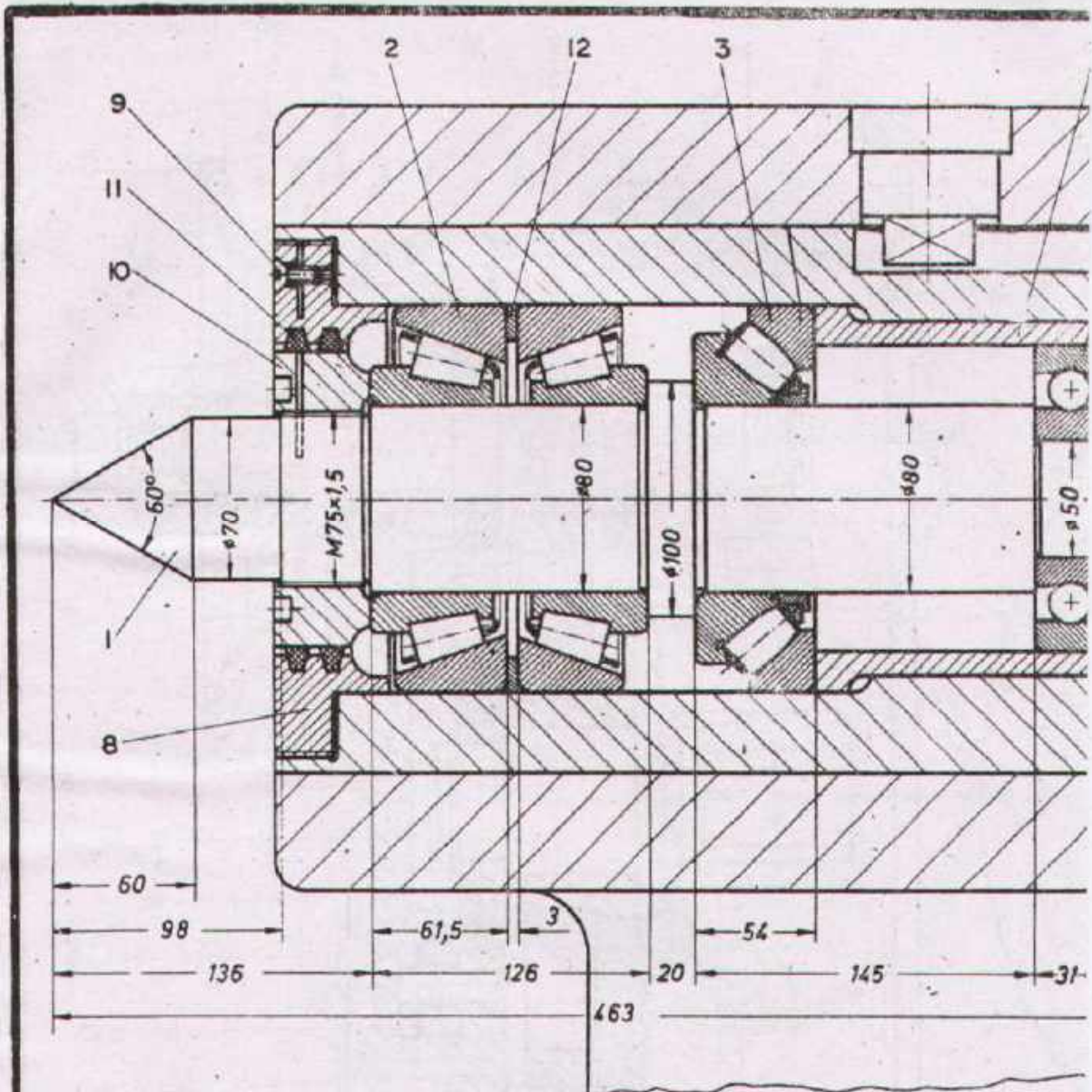
Name
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME

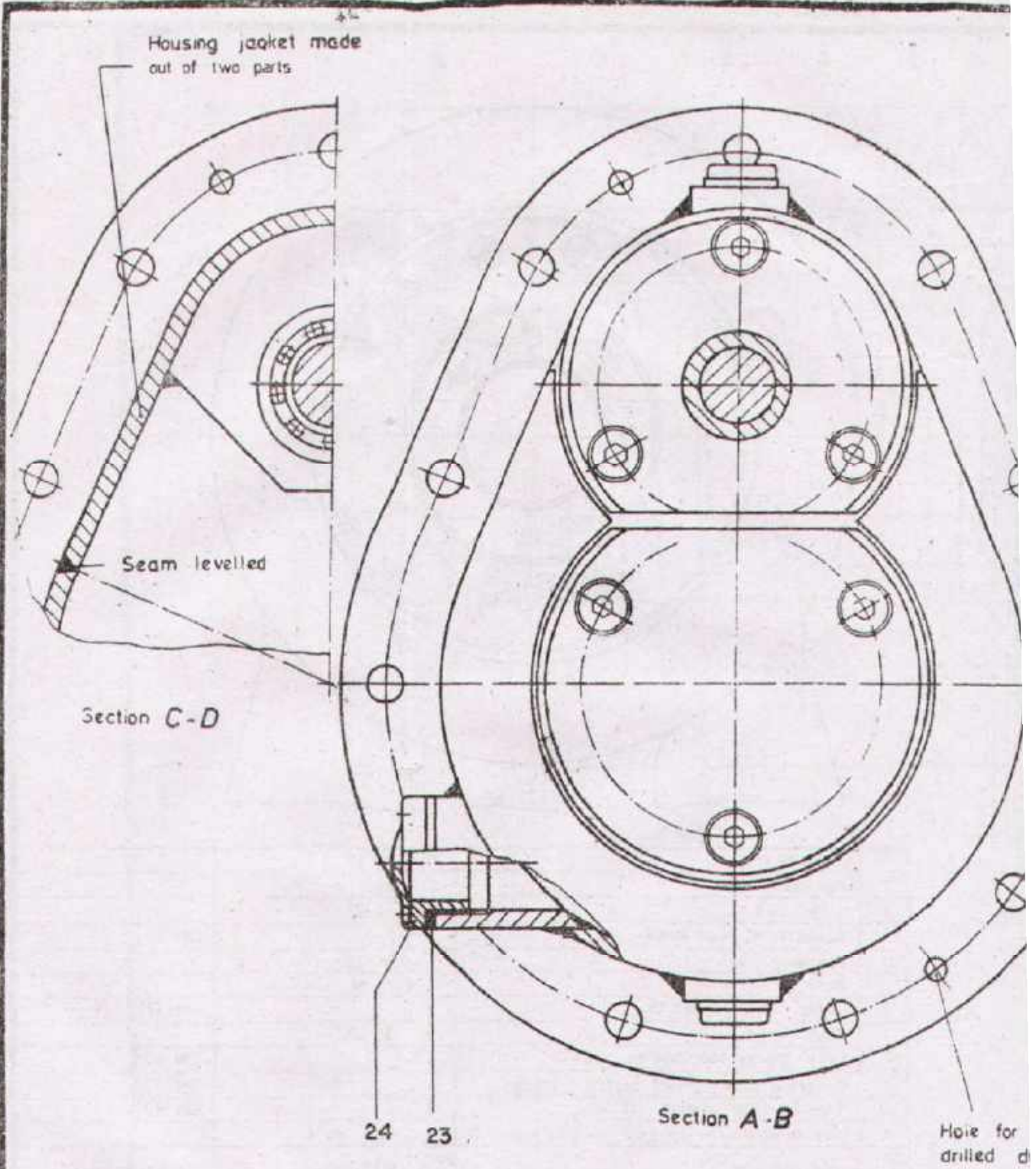
Trade
Practice **2**
No 77



Task:

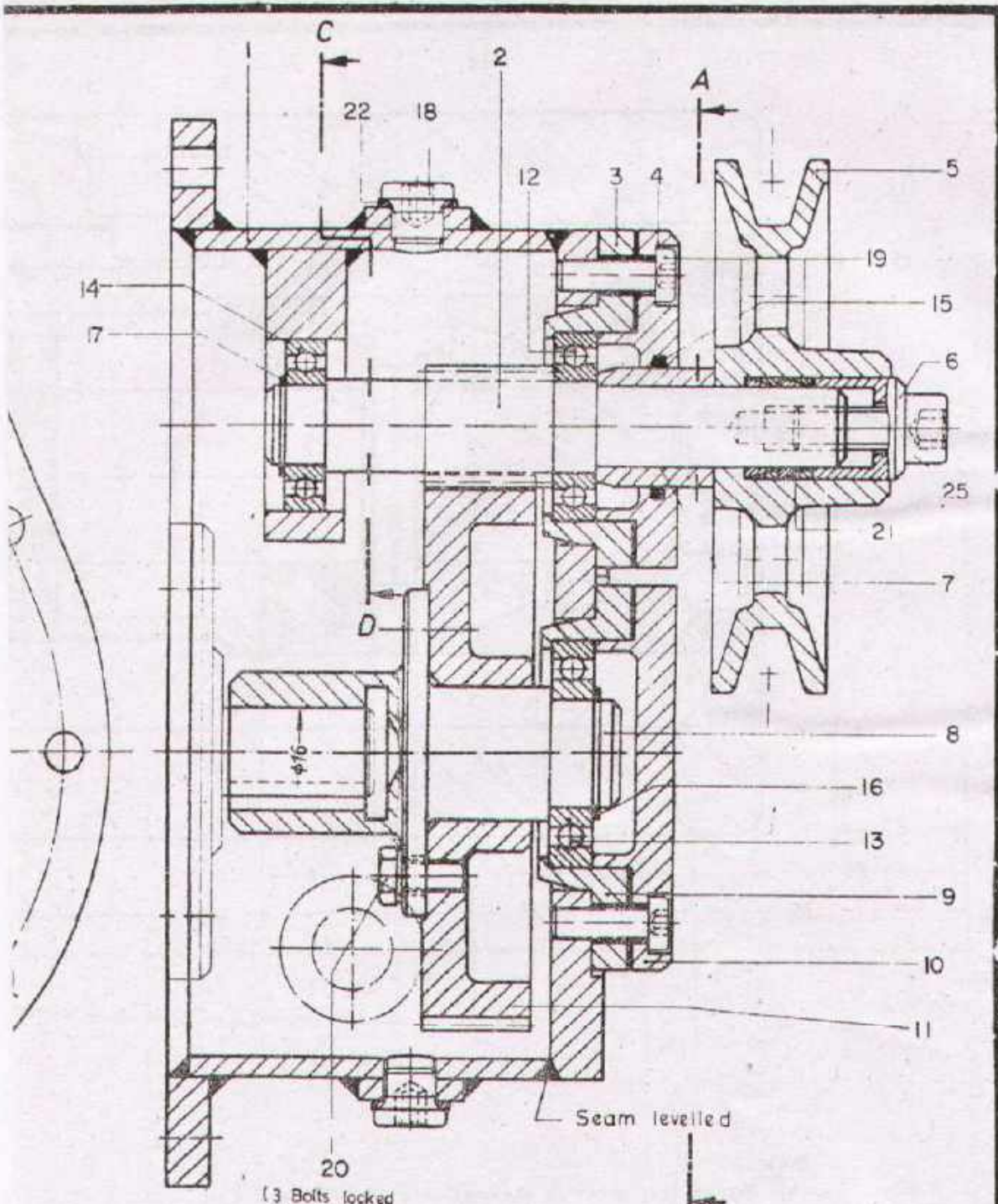
Prepare the workshop drawings of parts 1, 7 and 8
(scale 1:1).

Sizes are to be taken from the assembly drawing!



Task:

Prepare the detail drawings of all parts
 (except the standard parts).



pn 5mm to be
bring assembly

20
(3 Bolts locked
by wire)

Seam levelled

Scale 1:1 **FACE TYPE GEAR BOX**

| | | | |
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Date _____ | Checked | Name _____
Date _____ |
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DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING

PAK-GERMAN TECHNICAL TRAINING PROGRAMME


Trade Practice **2**
No. 78-1

| | | | | |
|---|------------------------------|----|--------------|----------|
| 1 | Socket head screw | 25 | 8.8 | DIN 912 |
| 1 | Oil level glass | 24 | St. 37 | |
| 1 | Sealing washer | 23 | Copper | |
| 2 | Sealing washer | 22 | Copper | |
| 2 | Clamping bush | 21 | St. 60 | |
| 3 | Hexagon head bolt | 20 | 8.8 | DIN 933 |
| 6 | Socket head screw M6x18 | 19 | 5.6 | DIN 7984 |
| 2 | Threaded plug | 18 | | DIN 908 |
| 1 | Circlip 15x1 | 17 | Spring steel | DIN 471 |
| 1 | Circlip 20x1,2 | 16 | Spring steel | DIN 471 |
| 1 | O-Ring Di= 22.3 d= 2.4 | 15 | Rubber | |
| 1 | Ball bearing 16002 | 14 | | DIN 625 |
| 1 | Ball bearing 16004 | 13 | | DIN 625 |
| 1 | Ball bearing 16003 | 12 | | DIN 625 |
| 1 | Gear z =80 m=1,25 | 11 | St. 50 | |
| 1 | Bearing cover | 10 | St. 42 | |
| 1 | Bearing holder | 9 | St. 42 | |
| 1 | Shaft | 8 | St. 50 | |
| 1 | Distance bush | 7 | St. 50 | |
| 1 | Clamping sleeve | 6 | St. 60 | |
| 1 | V-Pulley | 5 | C.I. | |
| 1 | Bearing cover | 4 | St. 42 | |
| 1 | Bearing holder | 3 | St. 42 | |
| 1 | Pinion shaft z = 16 m = 1,25 | 2 | St. 50 | |
| 1 | Housing | 1 | St. 37 | |

| No. REQD. | DESCRIPTION | PART No. | MATERIAL | STANDARD |
|-----------|-------------|----------|----------|----------|
|-----------|-------------|----------|----------|----------|

| | | | |
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| Scale | FACE TYPE GEAR BOX | | |
|-------|---------------------------|--|--|

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|  | DEVELOPMENT CELL FOR SKILLED LABOUR TRAINING | Trade Practice 2
No. 78-2 |
| | PAK-GERMAN TECHNICAL TRAINING PROGRAMME | |

