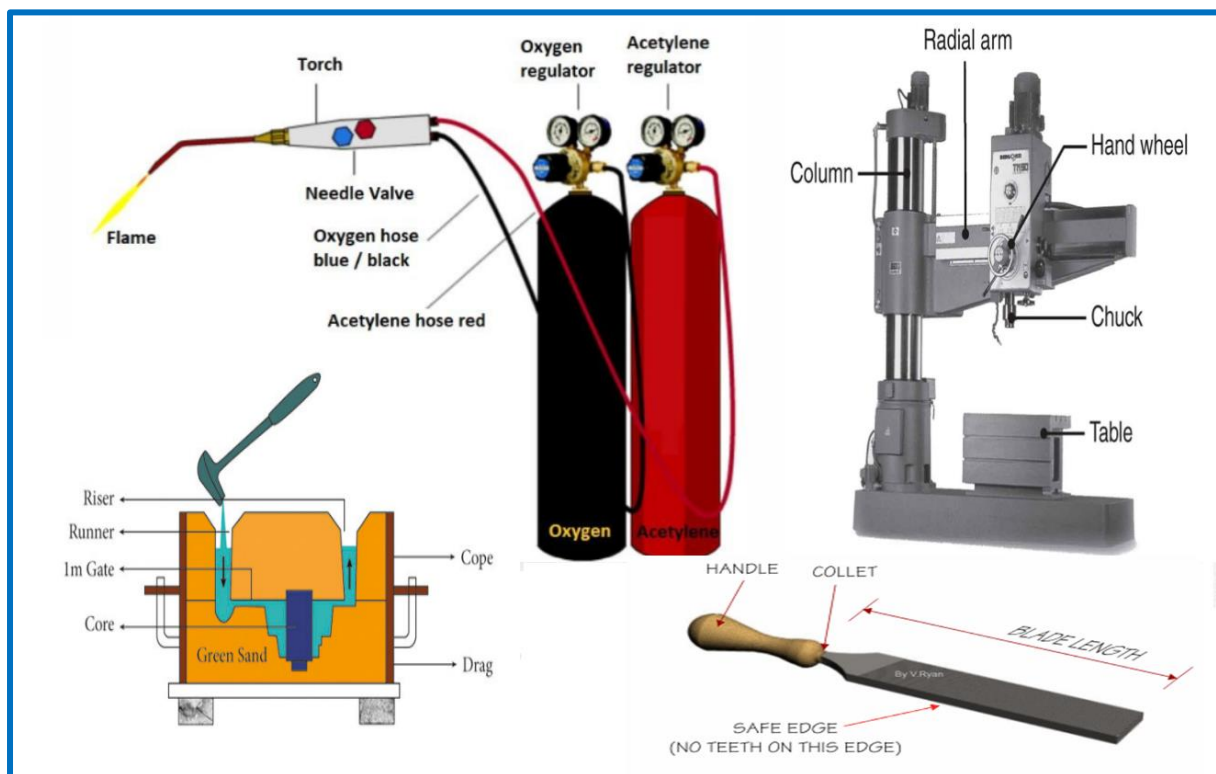


**THE HIGHER TECHNOLOGICAL INSTITUTE-TENTH OF RAMADAN CITY**

# Production Technology Workshop



*Prepared by*

**Assoc. Prof. Said Hussien Zoalfakar**

**Dr. Abdou Abdallah Hassan**

**Dr. Saleh Sobhy Abdelhady**

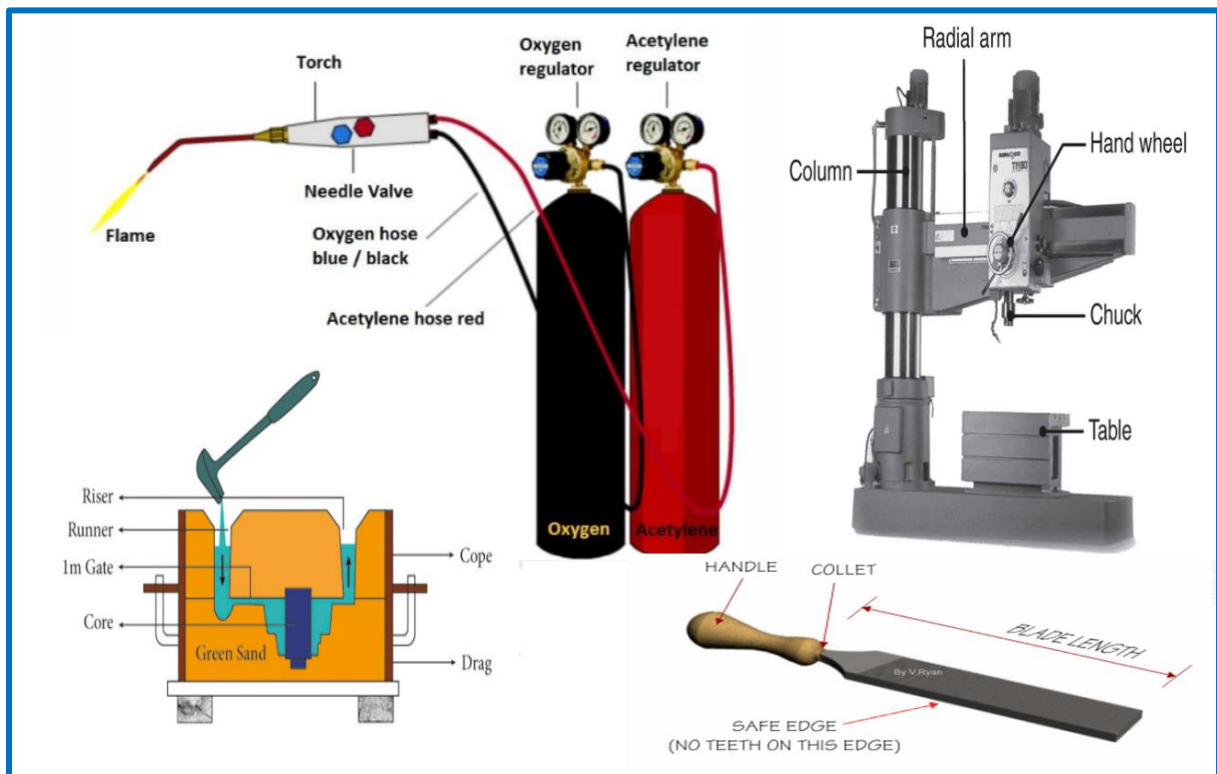
**Dr. Mostafa Abd El-Galil**



**H.T.I**

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**Course Code: ENG 005**

**2023/2024**

# Introduction

Every industrialized country depends on manufacturing. technicians and those in manufacturing. Knowing the numerous production processes, materials being processed, tools and equipments for producing various components or products with the best procedure is necessary in the sector. To prevent accidents, make a plan employing the right safeguards and established safety guidelines. Besides the aforementioned, all Future engineers of all stripes need to be familiar with the fundamentals of workshop activities in order to manpower, equipment, supplies, techniques, finances, and other infrastructure requirements to be positioned properly for ideal retail layouts, plant layouts, and other support services.

It is quite challenging for anyone to claim competence over the fundamentals of manufacturing processes and workshop technology. The study examines various workshop practises for transferring fundamental working knowledge of various engineering materials, tools, equipments, manufacturing processes, fundamental electromechanical controls of machine tools, production standards, characteristics of various testing instruments, and uses of various measuring or inspecting devices for examining components or products produced in various manufacturing shops in an industrial environment. Additionally, it defines and shows how to utilise a variety of hand tools (such as measuring, marking, holding, and cutting tools), as well as other tools, technology, and industrial techniques that make it easier to shape or mould the various raw materials already in existence into shapes that are useful

## مقدمة

تعتمد كل دولة صناعية على التصنيع. الفنيين والذين يعملون في التصنيع. إن معرفة عمليات الإنتاج العديدة والمواد التي تتم معالجتها والأدوات والمعدات اللازمة لإنتاج مكونات أو منتجات مختلفة بأفضل الإجراءات أمر ضروري في هذا القطاع. لمنع وقوع الحوادث، ضع خطة تستخدم فيها الضمانات الصحيحة وإرشادات السلامة المعمول بها. إلى جانب ما سبق ذكره، يجب على جميع مهندسي المستقبل من جميع المجالات أن يكونوا على دراية بأساسيات أنشطة ورشة العمل من أجل القوى العاملة والمعدات والإمدادات والتقنيات والتمويل ومتطلبات البنية التحتية الأخرى. ليتم وضعها بشكل صحيح لتخطيطات البيع بالتجزئة المثالية وتخطيطات المصانع وخدمات الدعم الأخرى. من الصعب جدًا لأي شخص أن يدعي الكفاءة في أساسيات عمليات التصنيع وتكنولوجيا الورش. تتناول الدراسة ممارسات ورشة العمل المختلفة لنقل المعرفة العملية الأساسية لمختلف المواد الهندسية والأدوات والمعدات وعمليات التصنيع والضوابط الكهروميكانيكية الأساسية للأدوات الآلية ومعايير الإنتاج وخصائص أدوات الاختبار المختلفة واستخدامات أجهزة القياس أو الفحص المختلفة لفحص المكونات أو المنتجات المنتجة في محلات التصنيع المختلفة في بيئة صناعية. بالإضافة إلى ذلك، فهو يحدد ويوضح كيفية استخدام مجموعة متنوعة من الأدوات اليدوية (مثل أدوات القياس ووضع العلامات والإمساك والقطع)، بالإضافة إلى الأدوات والتكنولوجيا والتقنيات الصناعية الأخرى التي تسهل تشكيل أو قولبة المواد الخام المختلفة. المواد الموجودة بالفعل إلى أشكال مفيدة

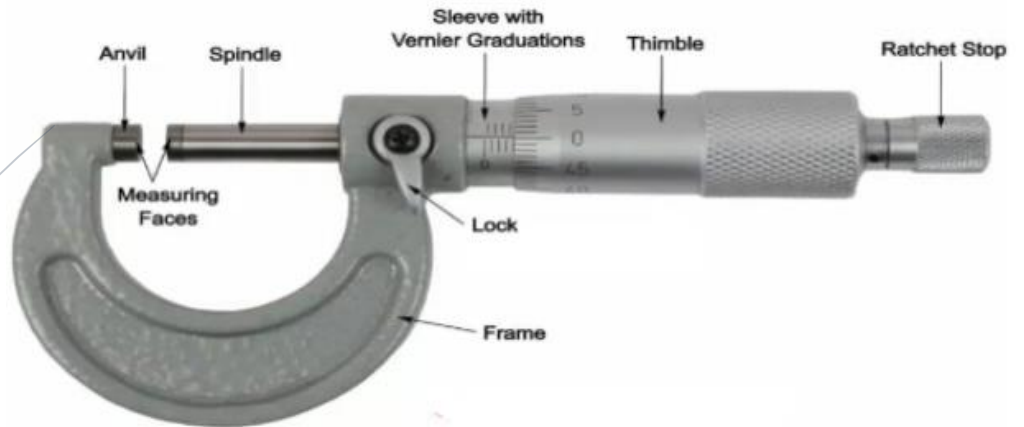
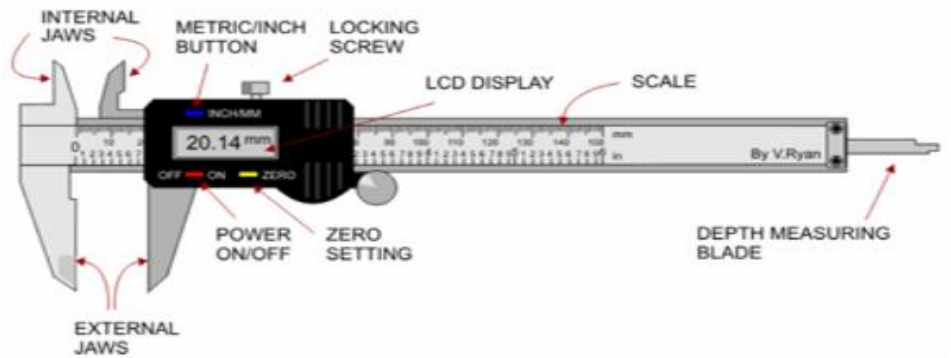


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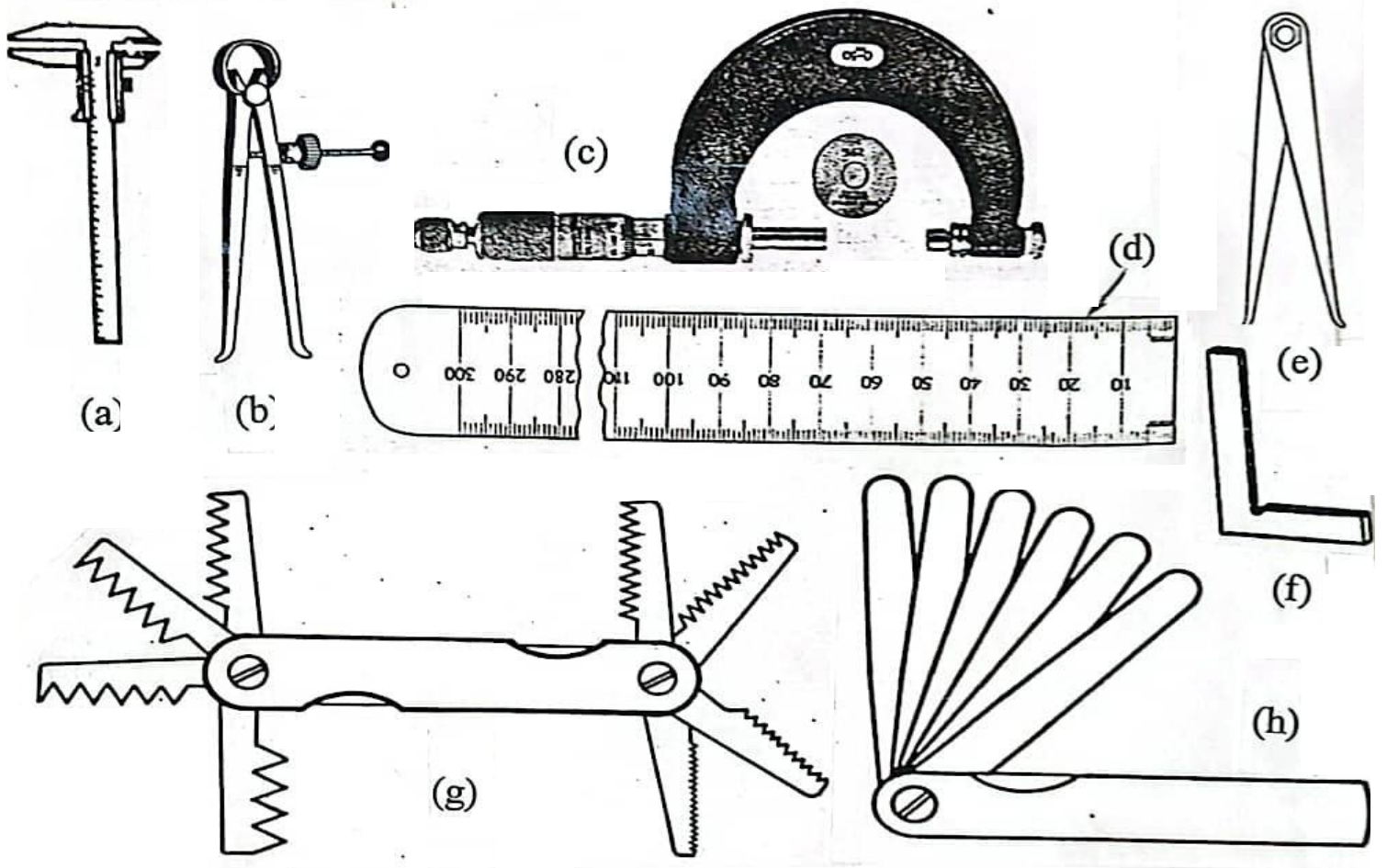
## Measurements Workshop



<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....

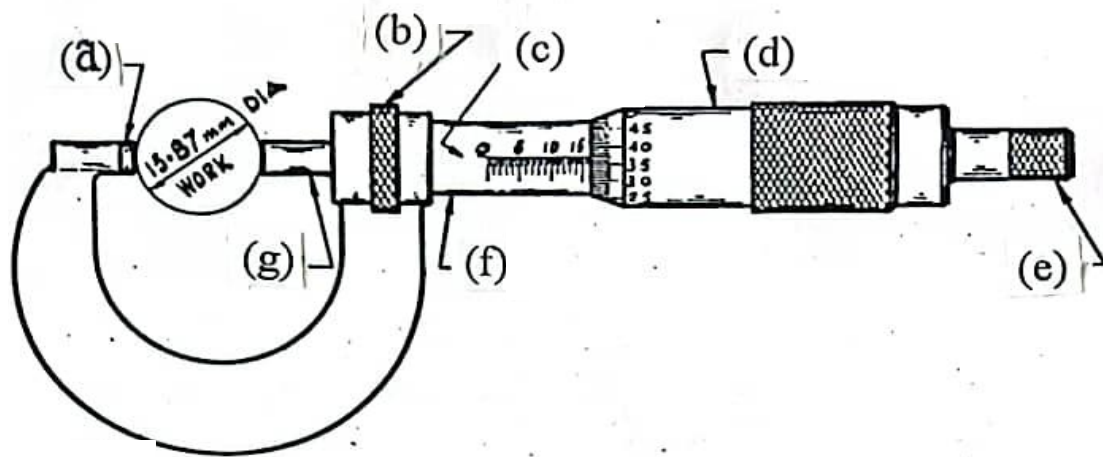
**Answer the following questions.**

1. Write the name of the each of the following measuring instruments and mention its functions:



- a. ....
- b. ....
- c. ....
- d. ....
- e. ....
- f. ....
- g. ....
- h. ....

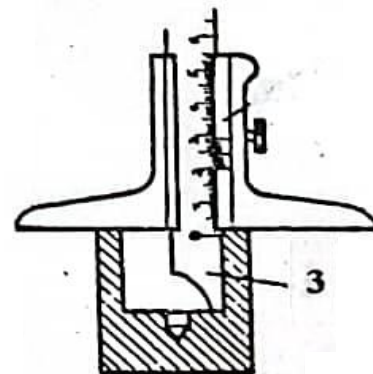
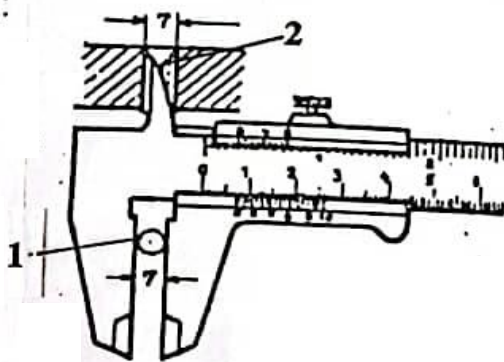
2. The following drawing shows the main parts of a micrometer, write the name of each part.



- a. ....
- b. ....
- c. ....
- d. ....
- e. ....
- f. ....
- g. ....

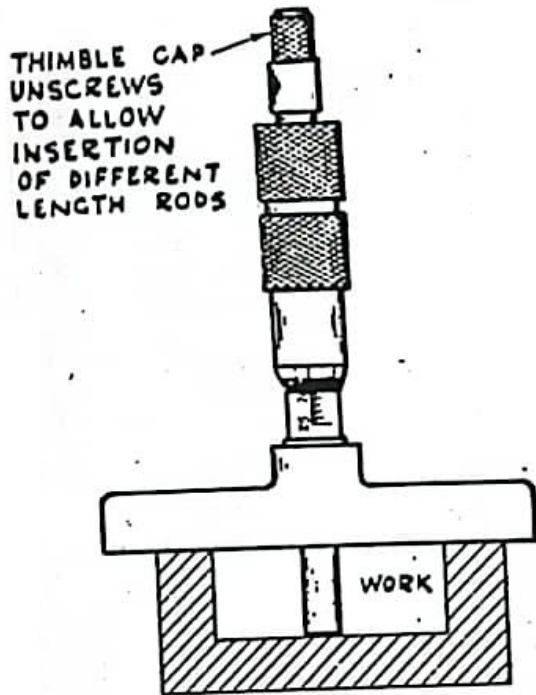
- b. ....
- d. ....
- f. ....

3. The following drawings shows the functions of vernier calipers. write the name of the each:

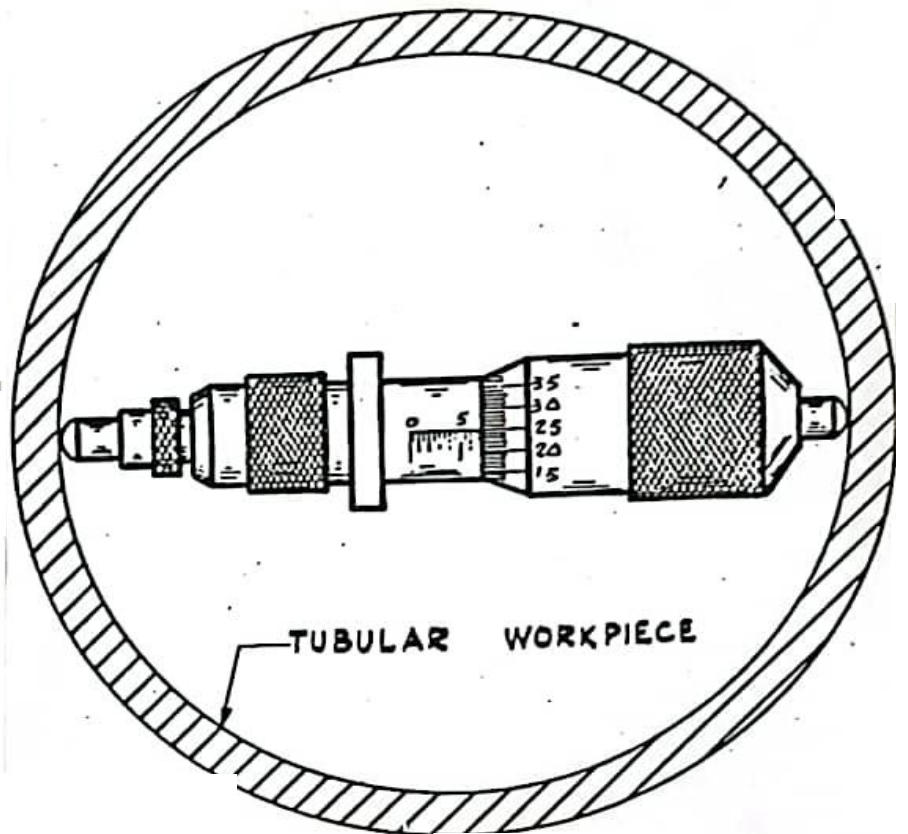


- 1. ....
- 2. ....
- 3. ....
- .....

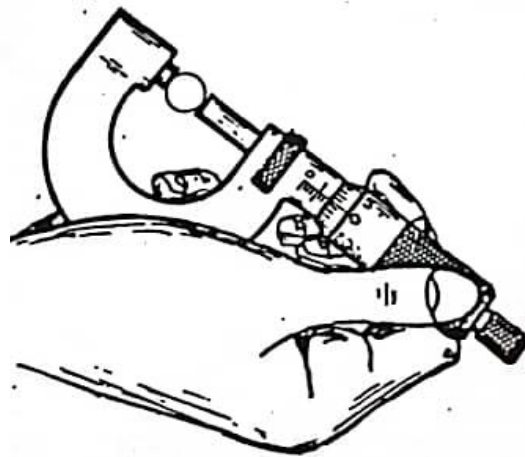
4. The following drawings shows the functions of micrometers. write the name of each function:



a



b



c

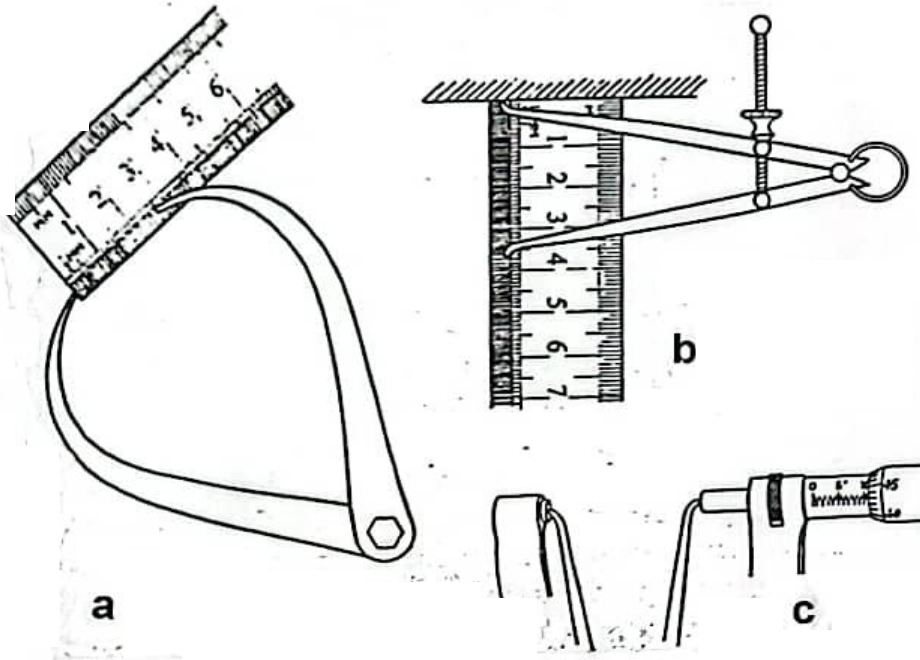
a. ....

b. ....

c. ....



5. The following drawings shows the functions of calipers. write the name of each function:

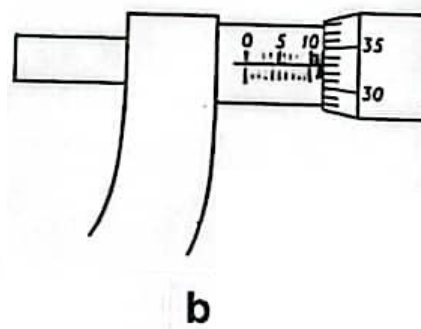
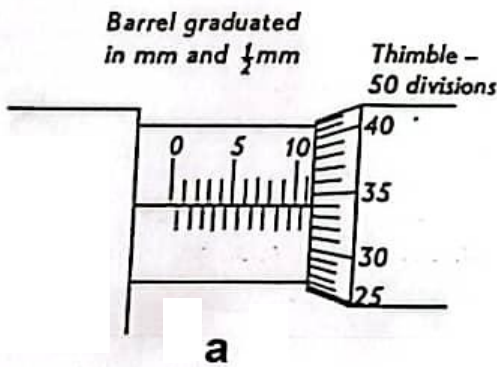


a. ....

b. ....

c. ....

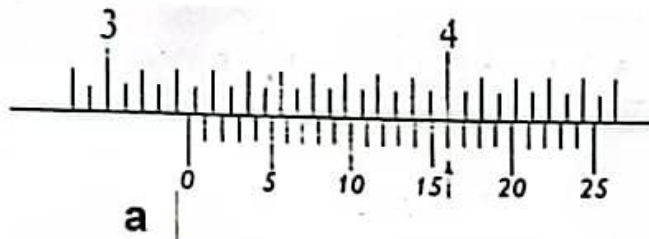
6. Write the reading of the micrometer in the following cases:



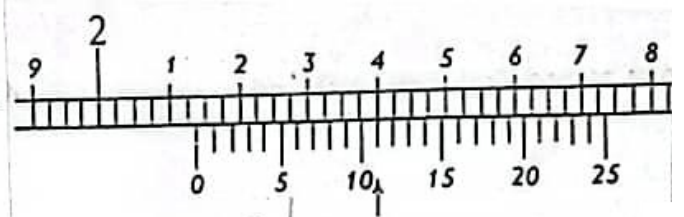
a. The reading is ..... mm

b. The reading is ..... mm

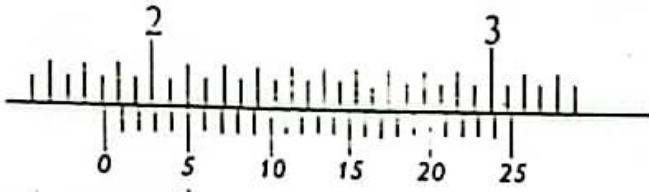
7. Write the reading of the vernier caliper in the following cases:



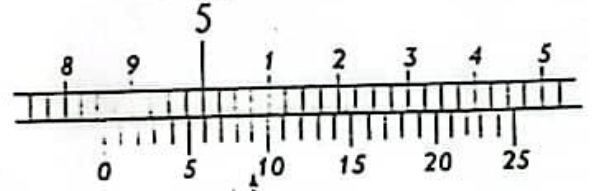
a



c



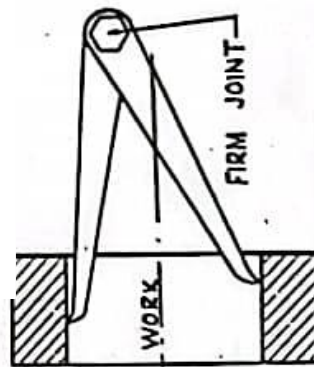
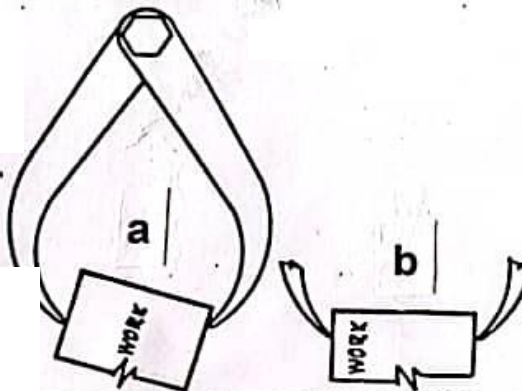
b



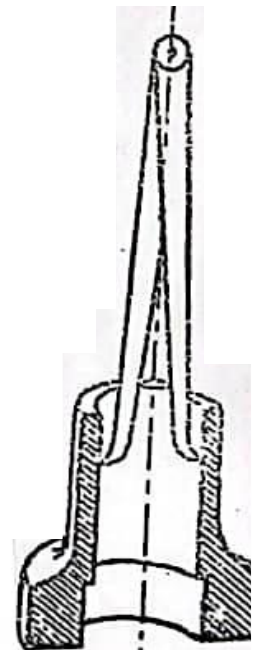
d

- a. The reading is ..... mm
- b. The reading is ..... mm
- c. The reading is ..... in.
- d. The reading is ..... in.

8. The following drawings shows the usage of calipers in measurements. write which of these positions is correct and which is incorrect.



c



d

- a. The reading method is .....
- b. The reading method is .....
- c. The reading method is .....
- d. The reading method is .....

**9. Sketch the vernier caliper readings mention in the following cases:**

**a. 13.35 mm**

**b. 5.868 in.**

**10. Sketch the micrometers readings mention in the following cases:**

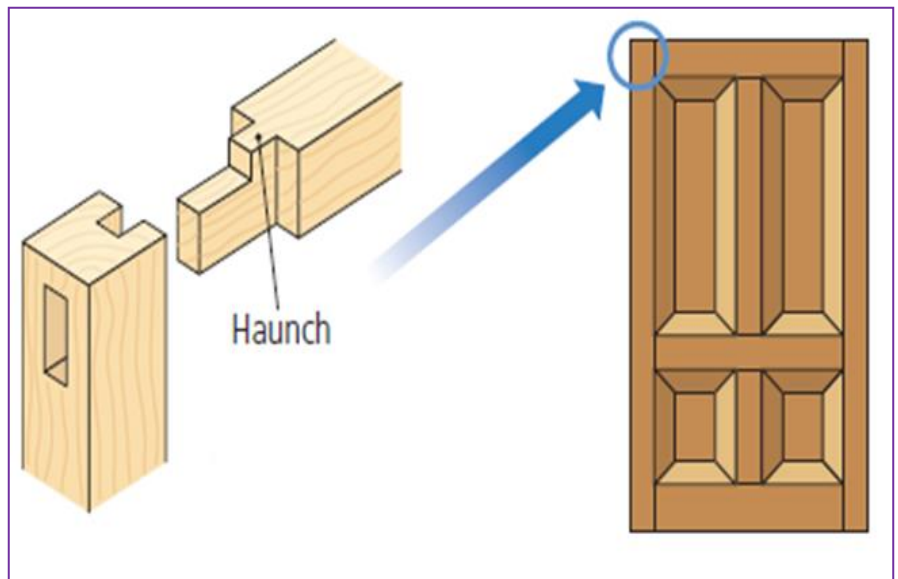
**a. 18.65 mm**

**b. 5.26 mm**



*Report for:*

## Wood Working Workshop



<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....

**Answer the following questions:**

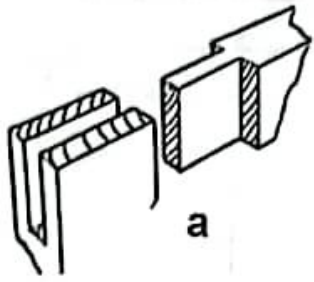
1. The sources of hazards in the wood working workshop are:

- a. ....
- b. ....
- c. ....
- d. ....
- e. ....

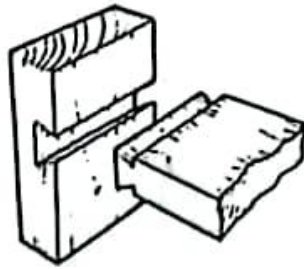
2. There are three types of woods; namely, soft wood, hard wood, and man-made boards. Classify each of the following wood, and then mention its main properties and its usage:

- a. *Mahogany* is .....wood, its priorities is.....  
....., and uses for.....
- b. *Plywood* is .....wood, its priorities is.....  
....., and uses for.....
- c. *Oak* is .....wood, its priorities is.....  
....., and uses for.....
- d. *Beech* is .....wood, its priorities is.....  
....., and uses for.....
- e. *Spruce* is .....wood, its priorities is.....  
....., and uses for.....

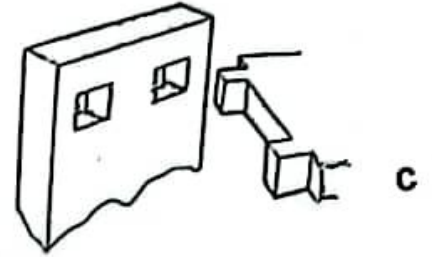
3. There are several variations of basic joints of wood, each is suitable for a specific job. Identify the type of the following joints and mention its usage:



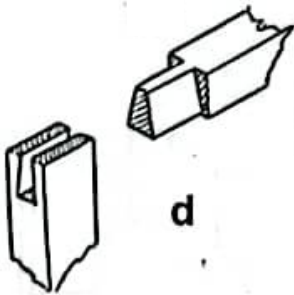
a



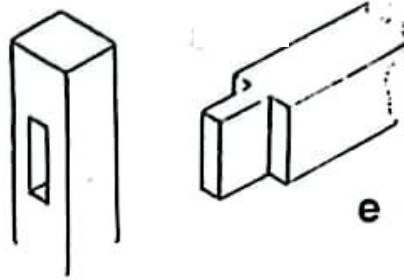
b



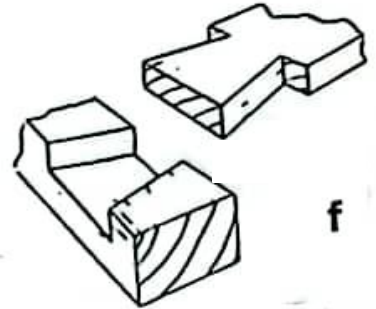
c



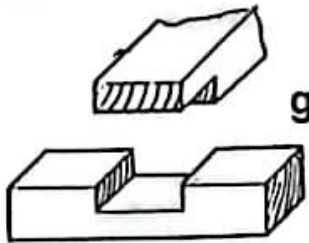
d



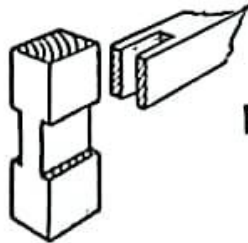
e



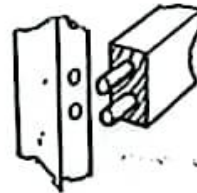
f



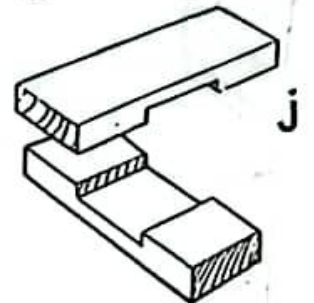
g



h



i



j

a. .... joint, uses for.....

b. .... joint, uses for.....

c. .... joint, uses for.....

d. .... joint, uses for.....

e. .... joint, uses for.....

f. .... joint, uses for.....

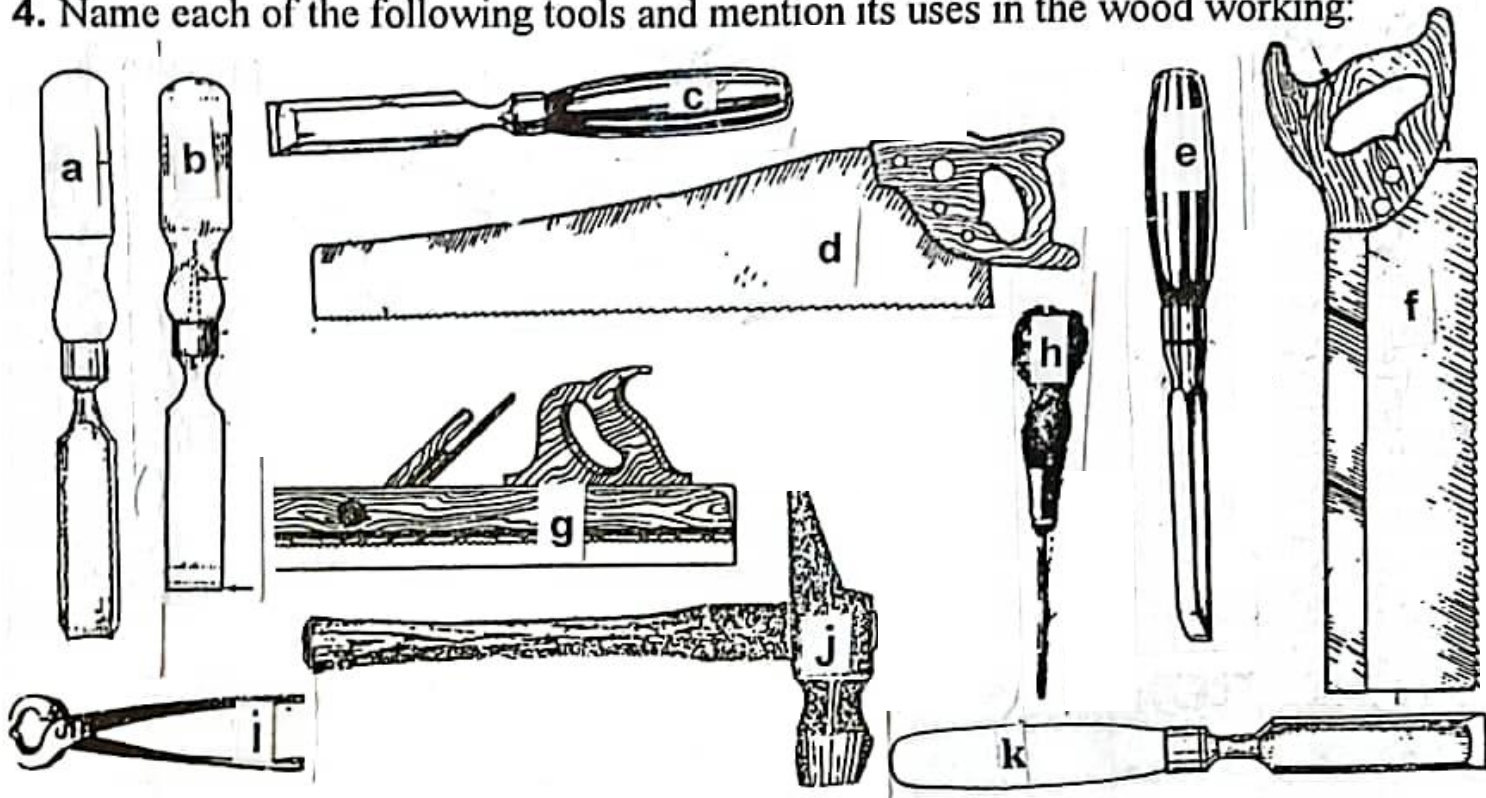
g. .... joint, uses for.....

h. .... joint, uses for.....

i. .... joint, uses for.....

j. .... joint, uses for.....

4. Name each of the following tools and mention its uses in the wood working:



- a. ....uses for .....
- b. ....uses for .....
- c. ....uses for .....
- d. ....uses for .....
- e. ....uses for .....
- f. ....uses for .....
- g. ....uses for .....
- h. ....uses for .....
- i. ....uses for .....
- j. ....uses for .....
- k. ....uses for .....



5. It is important to ensure that there is no any defects in the wood before using it to obtain a good product after manufacturing. State the defects which may be found in the woods and mention its reasons:

a. ....

.....

b. ....

.....

c. ....

.....

d. ....

.....

6. Draw a schematic drawing of the wood turning lathe found in the workshop, label its main parts and mention its uses:

It is uses for .....

.....

7. Draw a schematic drawing of the planers found in the wood working workshop, label its main parts and mention its uses:

It is uses for .....

.....

8. Draw a schematic drawing of the bandsaw found in the wood working workshop, label its main parts and mention its uses:

It is uses for .....

.....

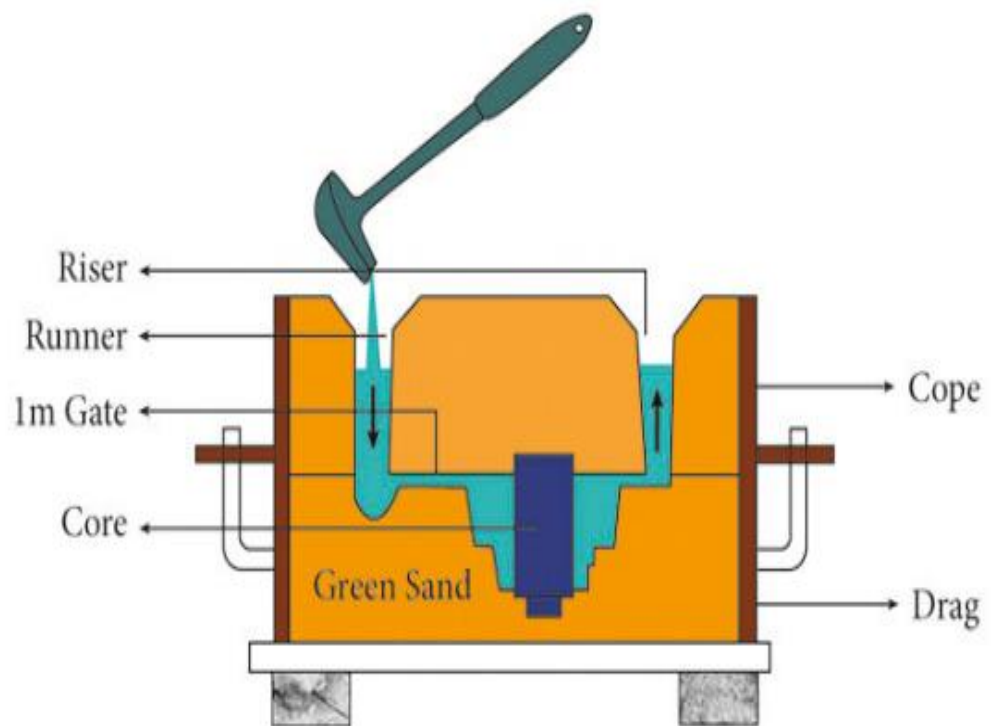
9. Draw a schematic drawing of the circular saw found in the wood working workshop, label its main parts and mention the difference between the bandsaw and circular saw according their uses:

The difference is.....  
.....

10. Select a product produced in the wood working workshop. Draw a schematic drawing for this product and mention the sequence of production and the tools required in the following table:

*Report for:*

## Casting Workshop



<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....



**Answer the following questions:**

1. The sources of hazards in the casting workshop are:

- a. ....
- b. ....
- c. ....
- d. ....

2. The safety equipment's of the casting workshop are:

- a. ....
- b. ....
- c. ....
- d. ....

3. Complete the following definitions,

- a. Fusibility is .....
- .....
- b. The casting is .....
- .....

4. The main advantages of casting processes are::

- a. ....
- b. ....
- c. ....

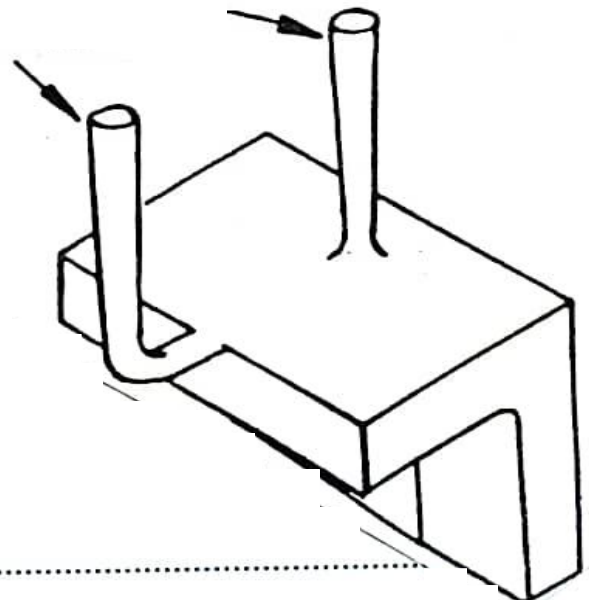
5. The properties of moulding sand are:

- a. ....
- b. ....
- c. ....
- d. ....

6. The main casting techniques (methods) are:

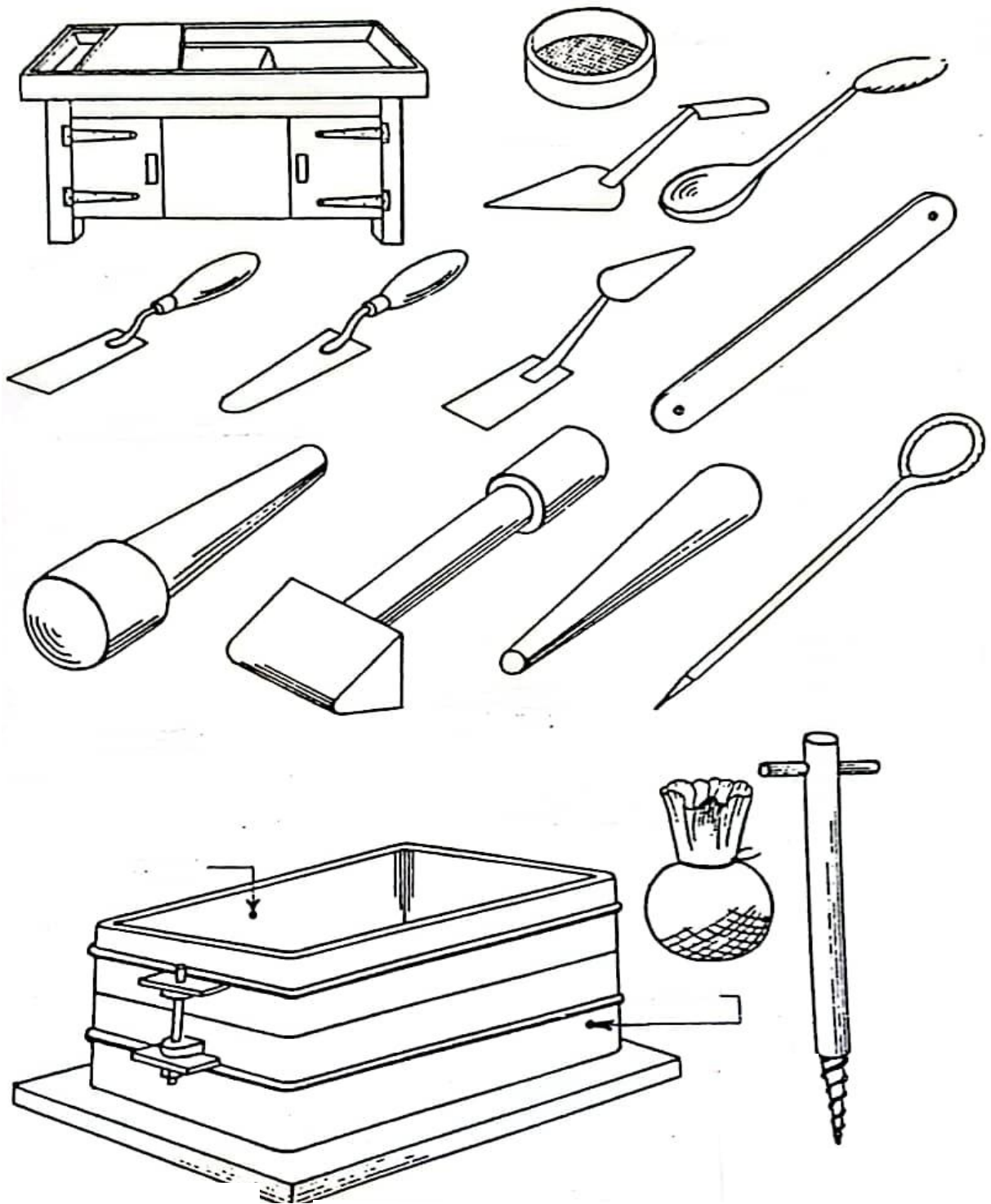
- a. ....
- b. ....
- c. ....
- d. ....
- e. ....

7. The following drawing shows a casting after removing the moulding sand. Label the riser and the runner, then complete the followings:.

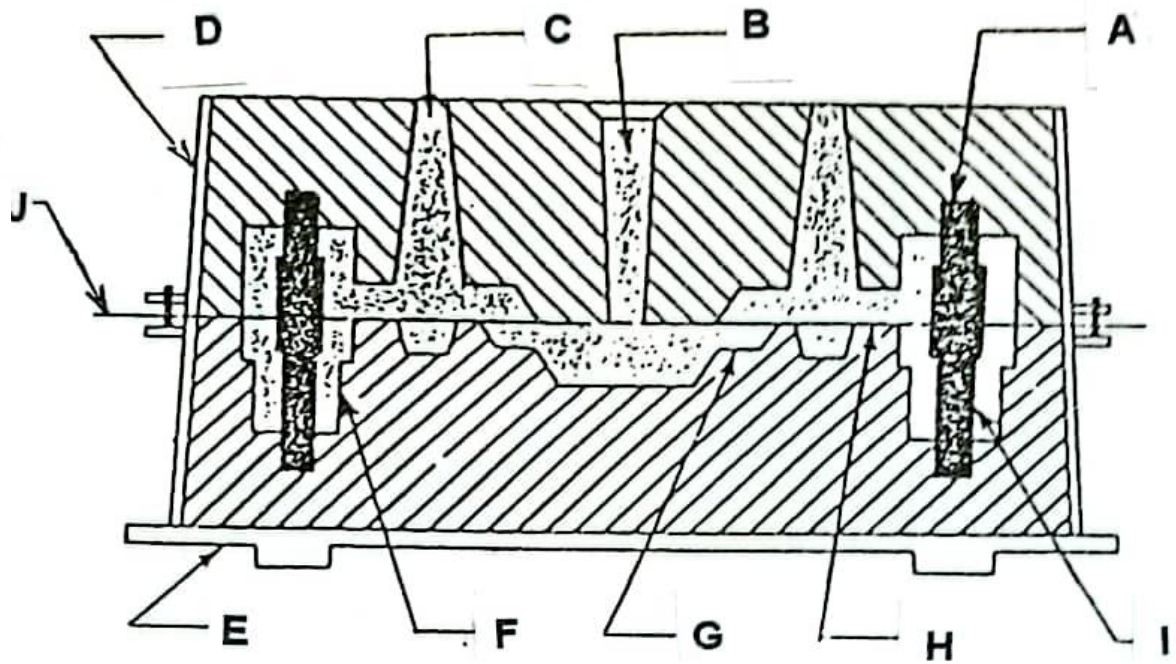


- a. The function of the riser is .....
- b. The function of the runner is .....

8. Write the name of the each of the following tools used in the casting workshop:



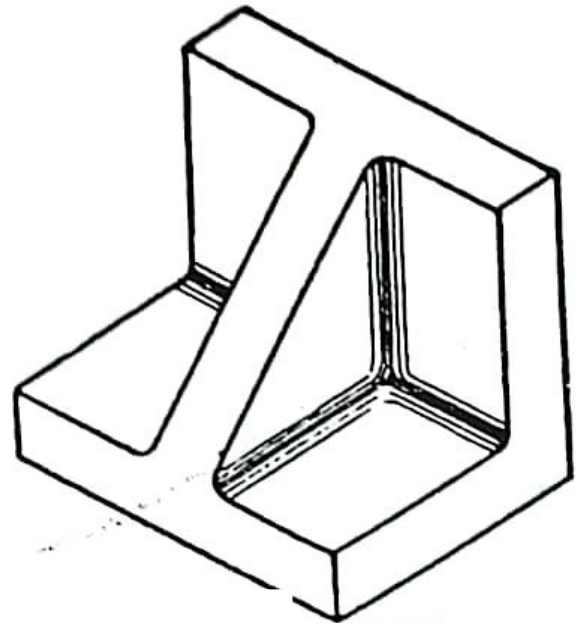
9. The following drawing shows a cross-section of a sand mould ready for pouring. Identify each item and mention its function:



- A. ....
- B. ....
- C. ....
- D. ....
- E. ....
- F. ....
- G. ....
- H. ....
- I. ....
- J. ....



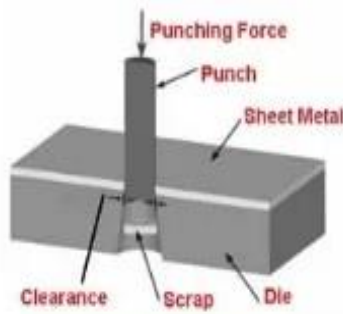
10. Explain with the aid of sketches the sequence of moulding the workpiece shown below:



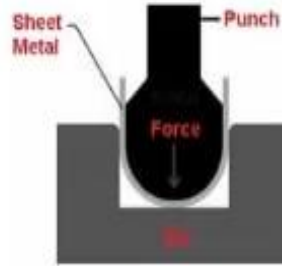
	Operation	Drawing	Tools used
1	.....		.....
2	.....		.....
3	.....		.....

## Report for:

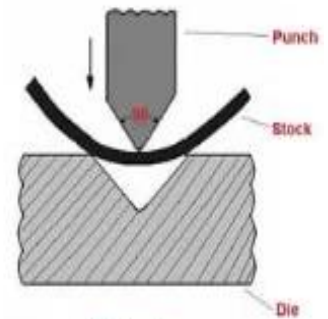
# Sheet Metal Workshop



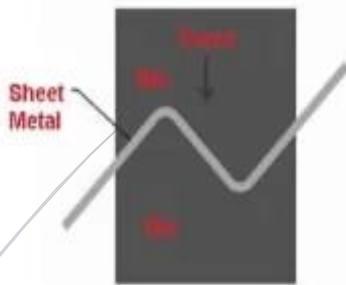
**Punching Operation**



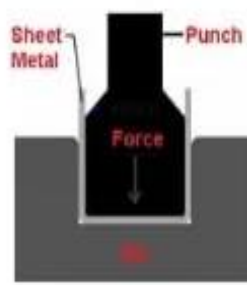
**U-Bending**



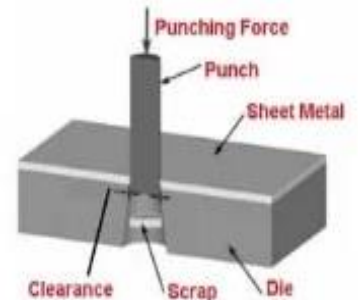
**V-Bending**



**Offset Bending**



**Channel Bending**



**Punching Operation**

<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....

**Answer the following questions:**

1. The sources of hazards in the sheet metal workshop are:

- a. ....
- b. ....
- c. ....
- d. ....
- e. ....

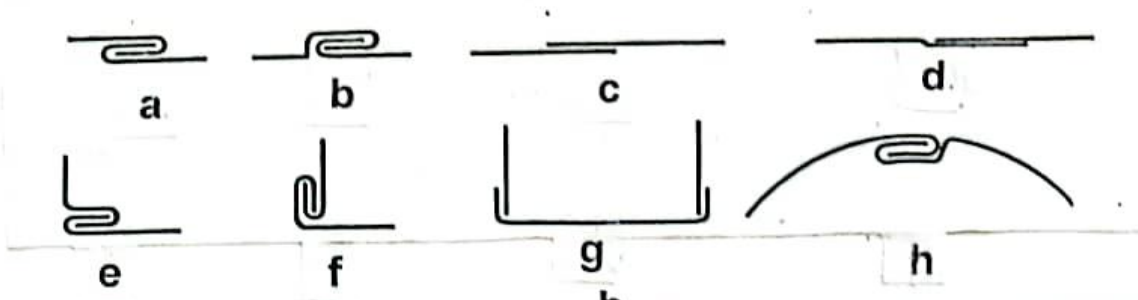
2. The types of sheets uses in the sheet metal working are:

- a. ....uses for.....
- b. ....uses for.....
- c. ....uses for.....
- d. ....uses for.....
- e. ....uses for.....

3. The main sheet metal operations are:

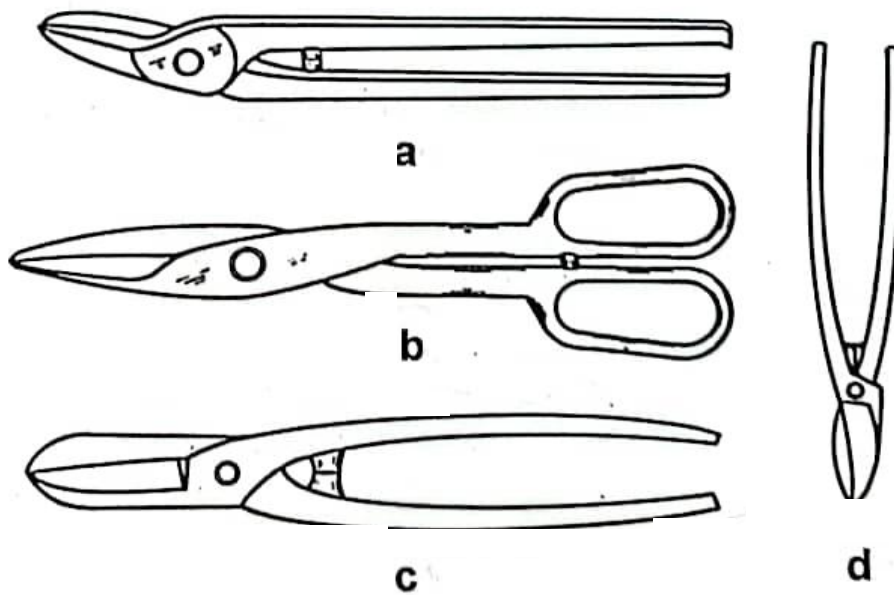
- a. ....
- b. ....
- c. ....
- d. ....
- e. ....
- f. ....
- g. ....
- h. ....

4. Name each of the following joints uses in the sheet metal working:



- a. .... b. ....  
 c. .... d. ....  
 e. .... f. ....  
 g. .... h. ....

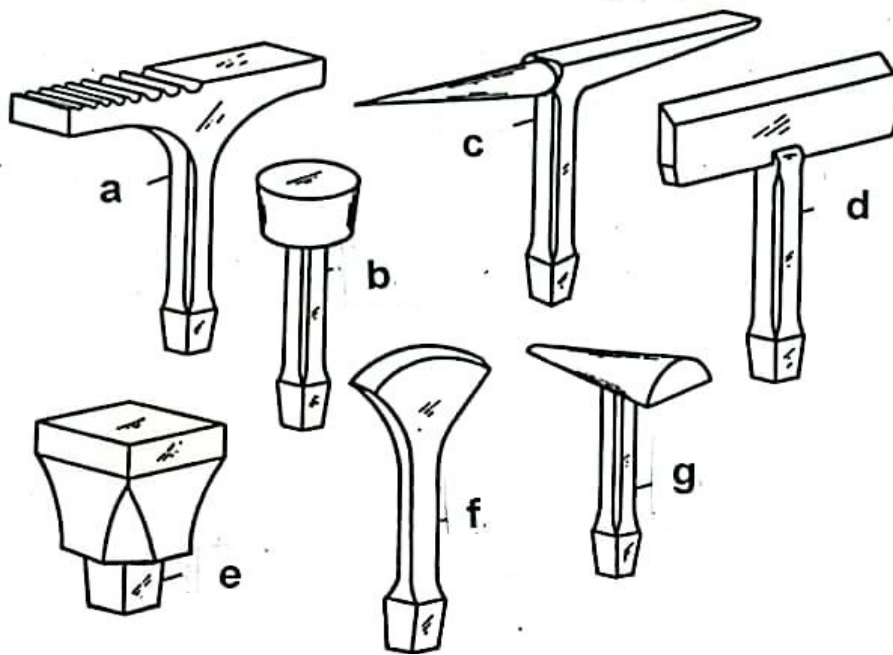
5. Name each of the following snips (hand shears) and mention its uses:



- a. .... uses for.....  
 b. .... uses for.....  
 c. .... uses for.....  
 d. .... uses for.....

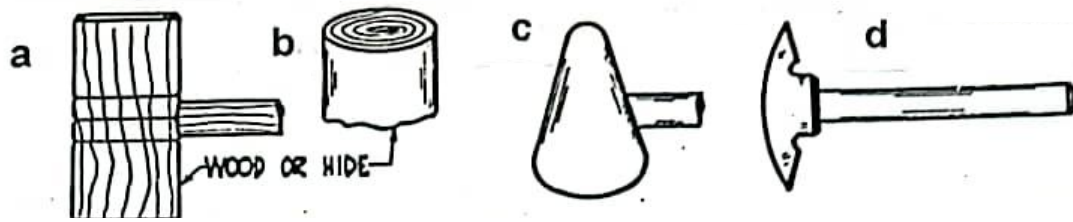


6. The following figure shows different types of stakes uses in the sheet metal working. Write the name of each of them and mention its uses:



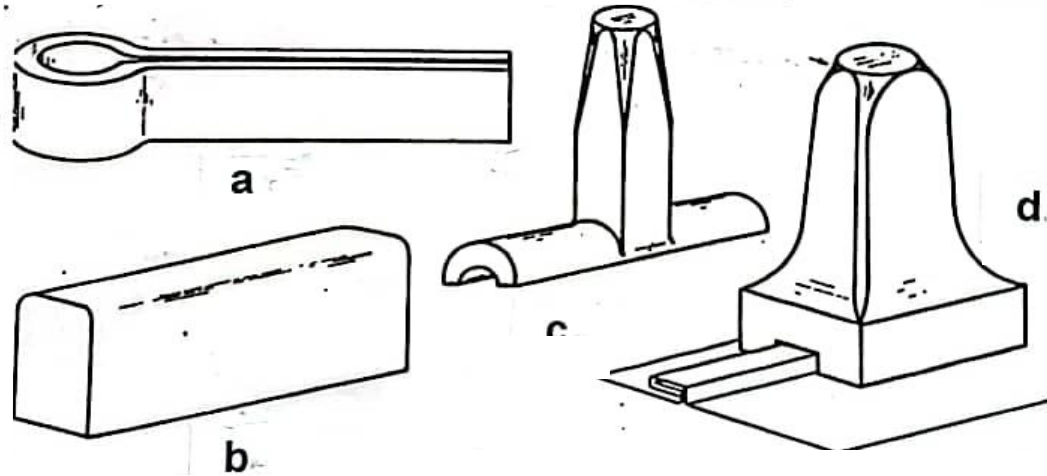
- a. ....uses for.....
- b. ....uses for.....
- c. ....uses for.....
- d. ....uses for.....
- e. ....uses for.....
- f. ....uses for.....
- g. ....uses for.....

7. The following figure shows different types of hammers uses in the sheet metal working. Write the name of each of them and mention its uses:



- a. ....uses for.....
- b. ....uses for.....
- c. ....uses for.....
- d. ....uses for.....

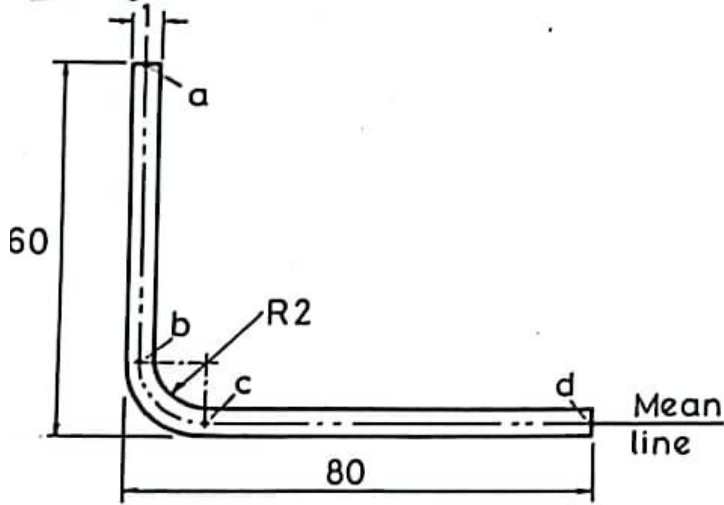
8. The following figure shows different tools uses in the sheet metal working. Identify each of them and mention its uses:



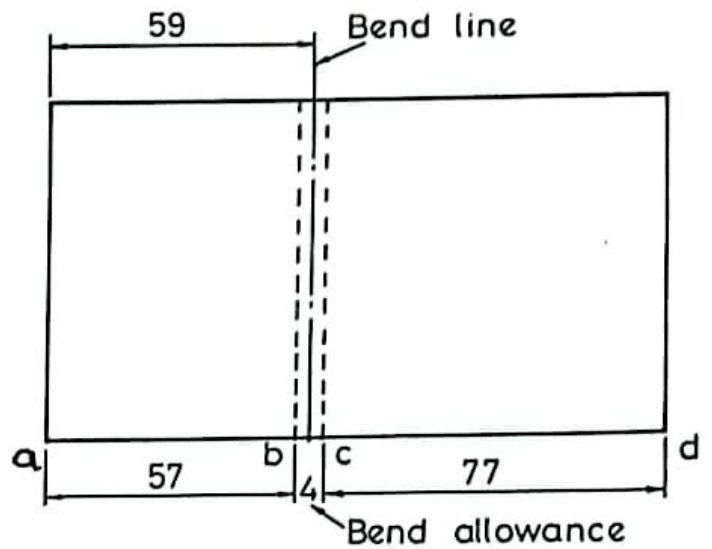
- a. ....uses for.....
- b. ....uses for.....
- c. ....uses for.....
- d. ....uses for.....

9. Given an example for calculating the blank length before bending for a right-angled bracket. Calculate the blank length before bending (also draw it as that in the example) of the shapes given below:

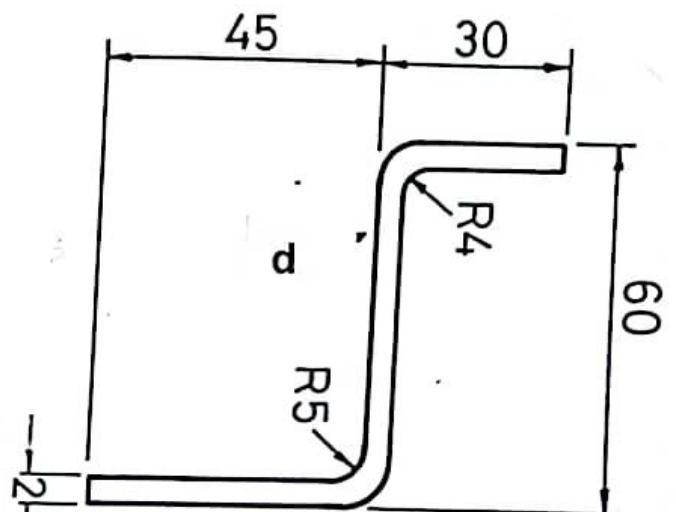
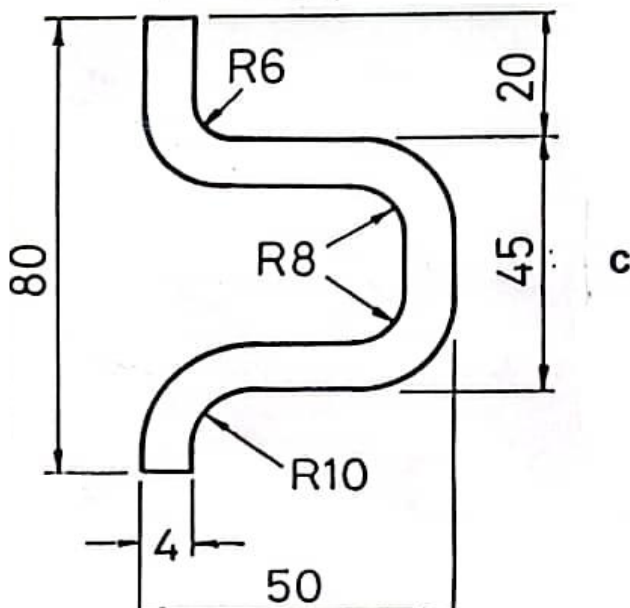
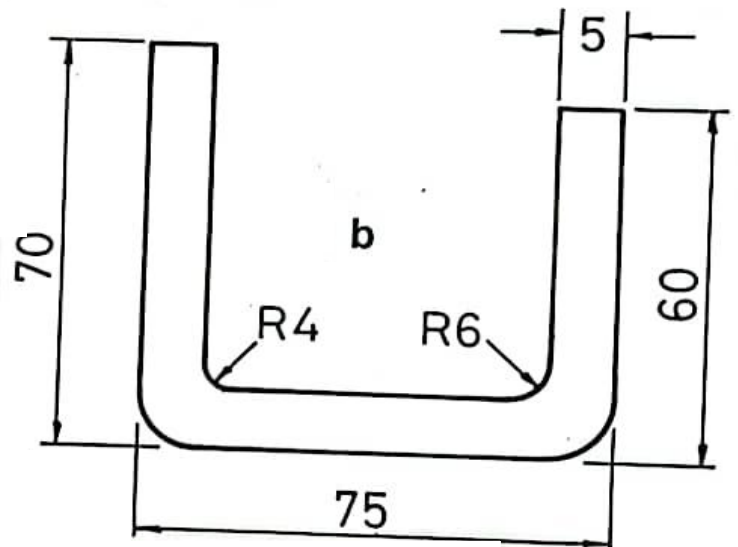
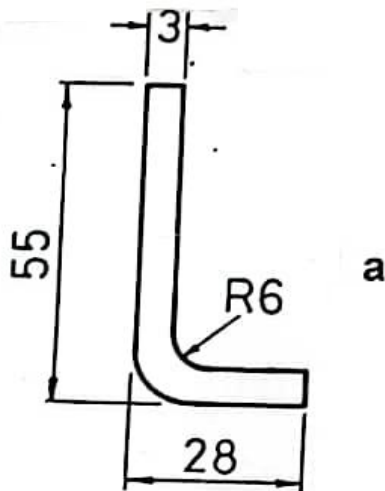
Example:



Right-angled bracket



Development of right-angled bracket



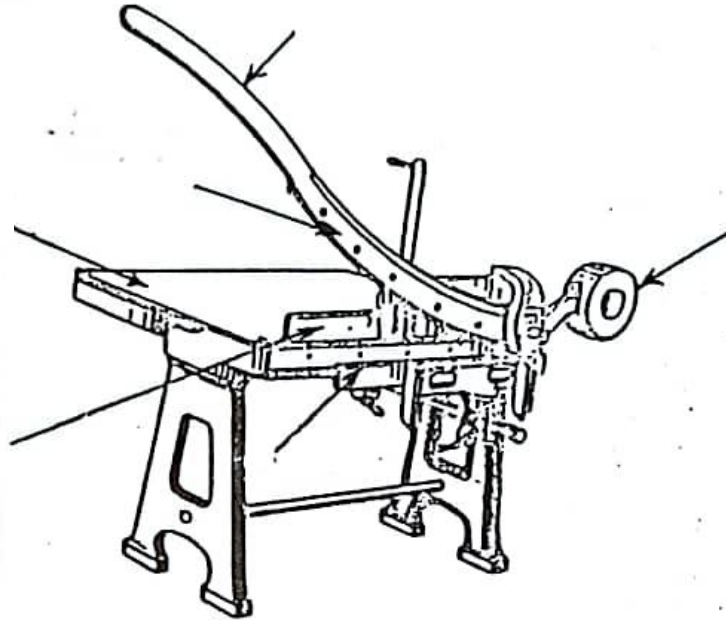
**a.** The length is.....mm

**b.** The length is.....mm

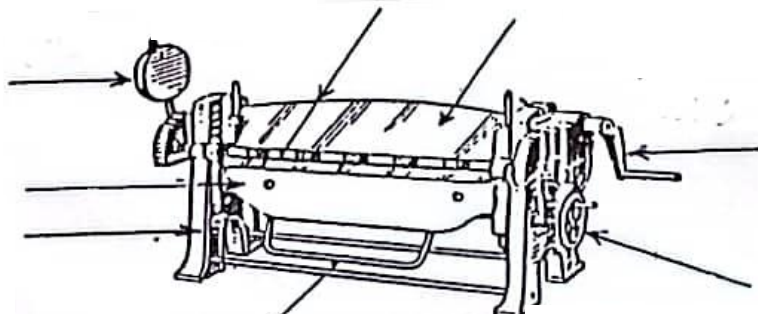
**c.** The length is.....mm

**d.** The length is.....mm

10. The figure given below shows a schematic drawing of the hand operated shear used in the workshop for the sheet metal working, label its main parts:



11. Label the items of the bending machine given below which is used in the workshop for sheet metal working:



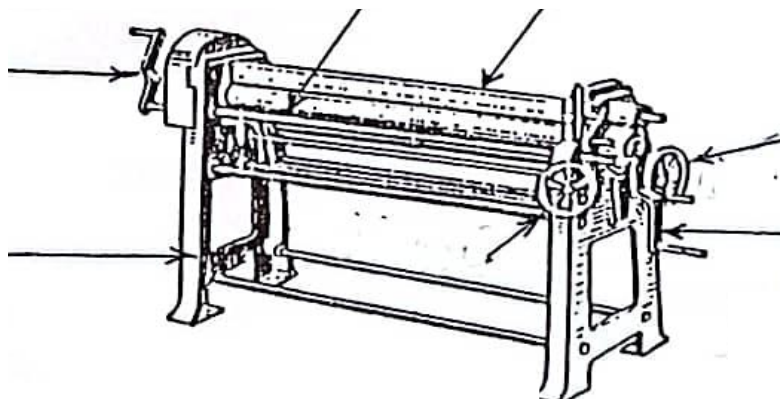
12. Draw sketches for the different types of rolling mills, and then label each item of the rolling machine given below :

a. .... mill

b. .... mill

c. .... mill

d. .... mill



The rolling machine uses in the workshop



**13.** Draw a schematic diagram for the spot welding machine uses in the workshop for the sheet metal working and label its main parts:

**14.** Draw the workpiece that you are produced in the workshop, and then complete the table:

## *Report for:*

## Bench Working Workshop



(A) All-purpose.



(B) Handy.



(C) Flat.



(D) Hand.



(E) Half-round.



(F) Round.



(G) Square.



(H) Pillar.



(I) Three-square.



(J) Warding.



(K) Knife.

<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....



**Answer the following questions:**

**1. The sources of hazards in the bench-working workshop are:**

- a. ....
- b. ....
- c. ....
- d. ....

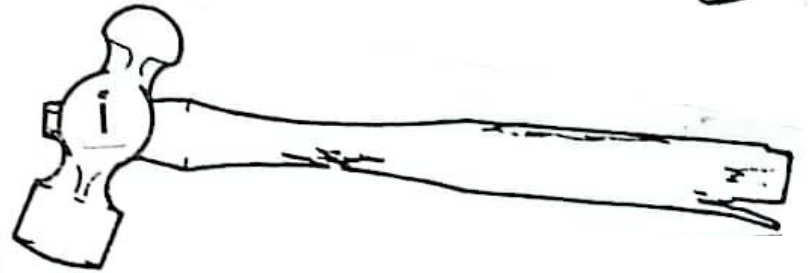
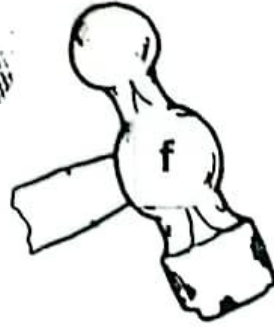
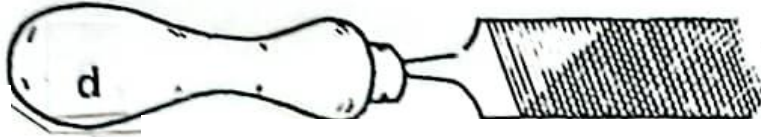
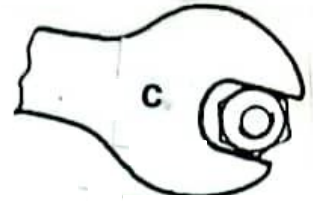
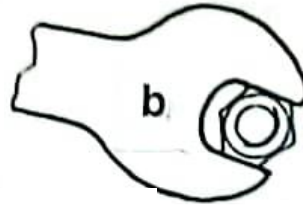
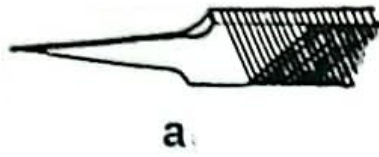
**2. The safety equipment's of the bench-working workshop are:**

- a. ....
- b. ....
- c. ....
- d. ....

**3. The safety precautions that should be observed to prevent the hand tools hazards are:**

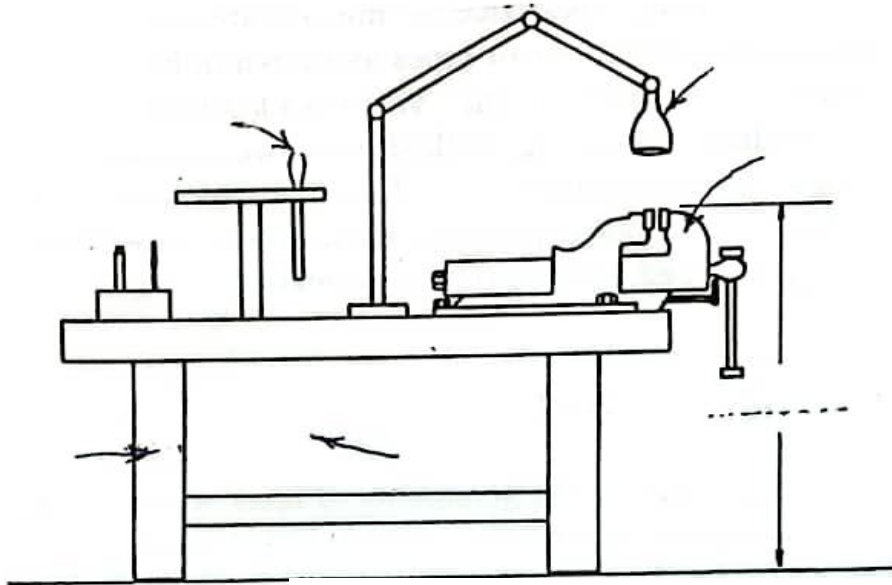
- a. ....
- b. ....
- c. ....
- d. ....
- e. ....
- f. ....
- g. ....
- h. ....

4. Identify which of the following hand tools is correct for working and which is wrong (i.e. may cause hazard) and mention the reason:



- a. ....
- b. ....
- c. ....
- d. ....
- e. ....
- f. ....
- g. ....
- h. ....
- i. ....

5. Label each item on the working bench shown below:



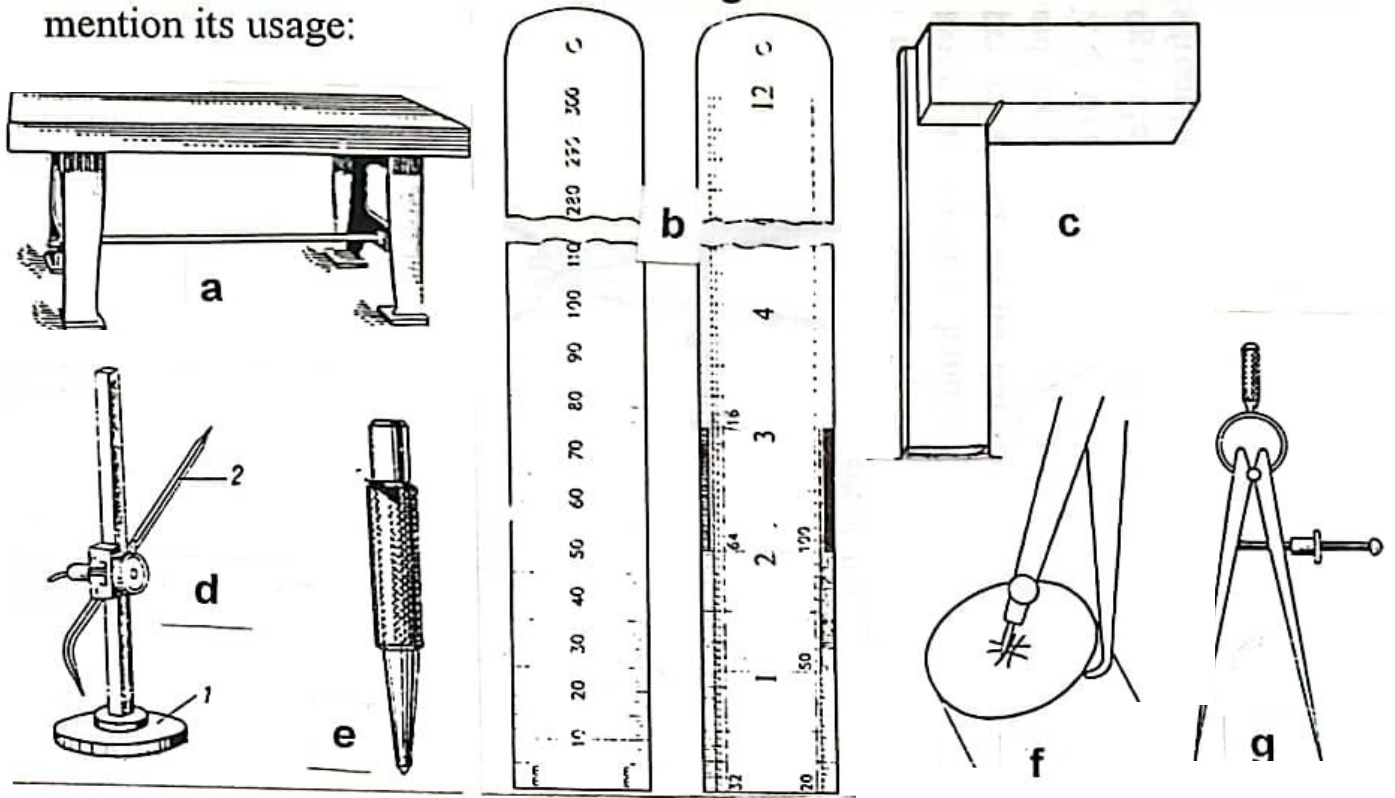
6. The requirements of the work bench are:

- a. ....
- b. ....
- c. ....
- d. ....

7. The purposes of marking out are:

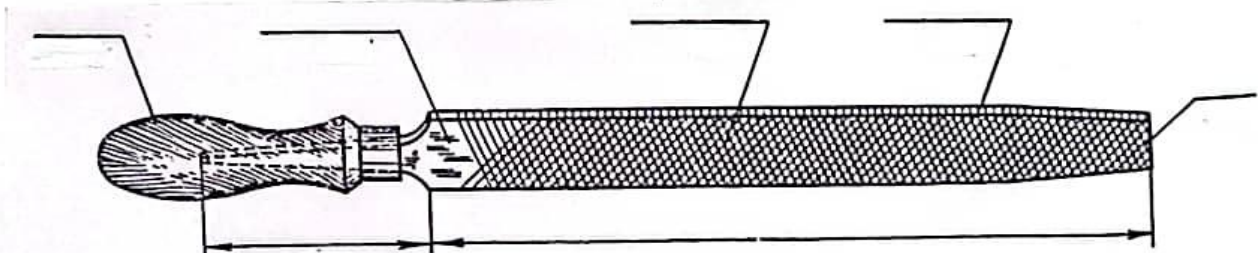
- a. ....  
.....
- b. ....  
.....

8. The following drawing shows marking-out tools. Name each of them and mention its usage:



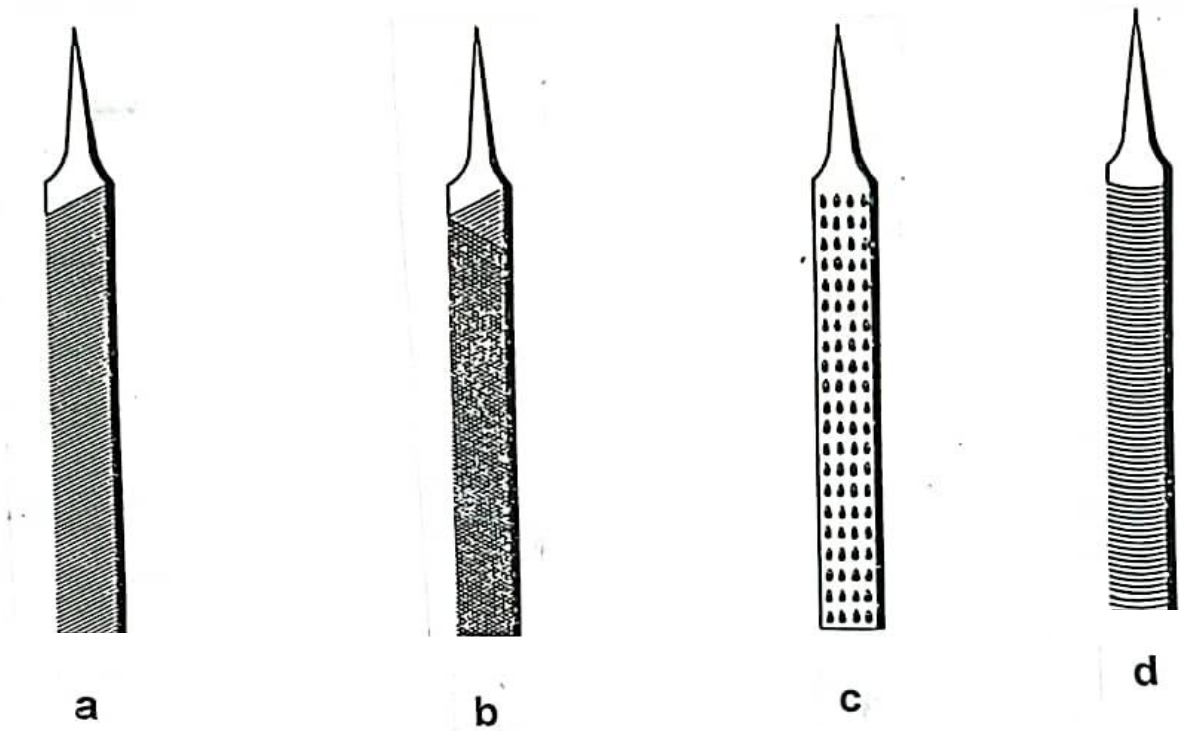
- a. .... using for .....
- b. .... using for .....
- c. .... using for .....
- d. .... using for .....
- e. .... using for .....
- f. .... using for .....
- g. .... using for .....

9. Label each element of the file given below:





10. Specify the types of the cuts of the following files and mention its usage:



- a. ....cut                      using for.....
- b. ....cut                      using for.....
- c. ....cut                      using for.....
- d. ....cut                      using for.....




11. Identify the types of cold chisel and mention its usage:

- a. ....chisel                      is using for.....
- b. ....chisel                      is using for.....
- c. ....chisel                      is using for.....

12. Draw a neat sketch for the three taps used in making the thread on the bench, then mention the function of each of them:

- a. The first tap is..... It is used for.....
- b. The second tap is..... It is used for.....
- c. The third tap is..... It is used for.....

13. Complete the following table regarding the metal removal techniques employed at the bench:

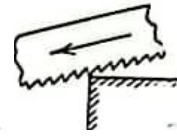
Drawing	Tool name	Usage
	<p>.....</p>	<p>.....</p>
	<p>.....</p>	<p>.....</p>
	<p>.....</p>	<p>.....</p>



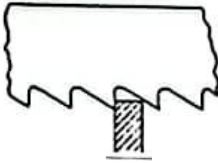
14. Specify which of the following applications of sawing is correct and which is wrong and mention the reason:



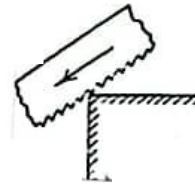
a



b



c



d

a. ....

b. ....

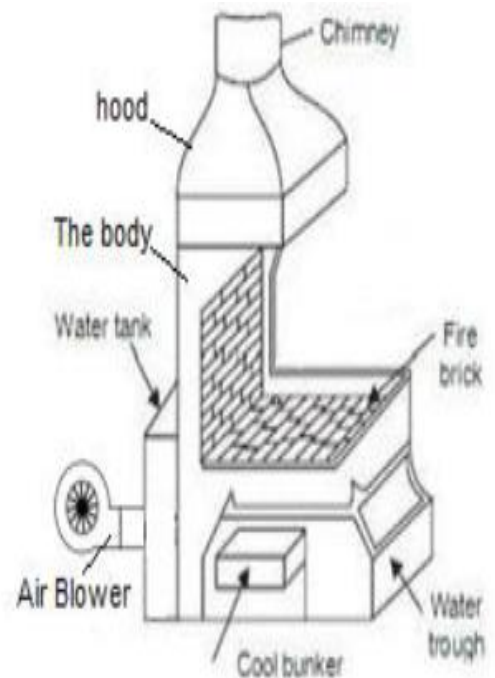
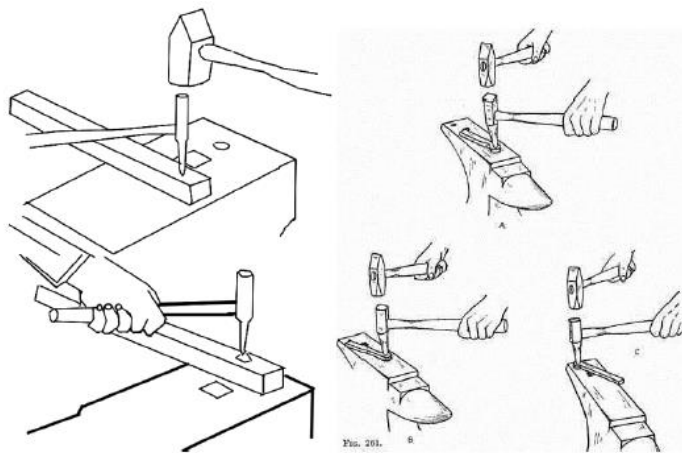
c. ....

d. ....

15. Draw the workpiece that you are produced in the workshop, and then complete the table:

## Report for:

## Forging Workshop



<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....

**Answer the following questions:**

**1.** The sources of hazards in the forging workshop are:

- a. ....
- b. ....
- c. ....
- d. ....

**2.** The safety equipment's of the forging workshop are:

- a. ....
- b. ....
- c. ....
- d. ....

**3.** complete the followings:

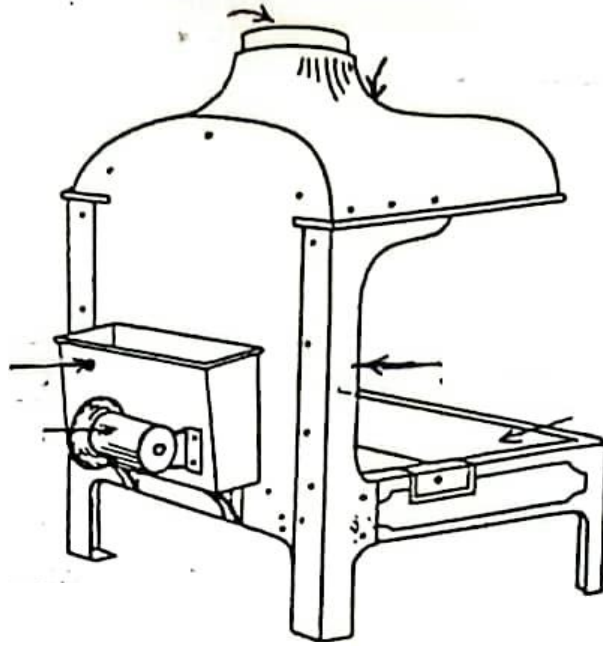
a. The cold working is done .....temperature, but the hot working is done.....temperature.

b. The advantages of hot working.....  
.....

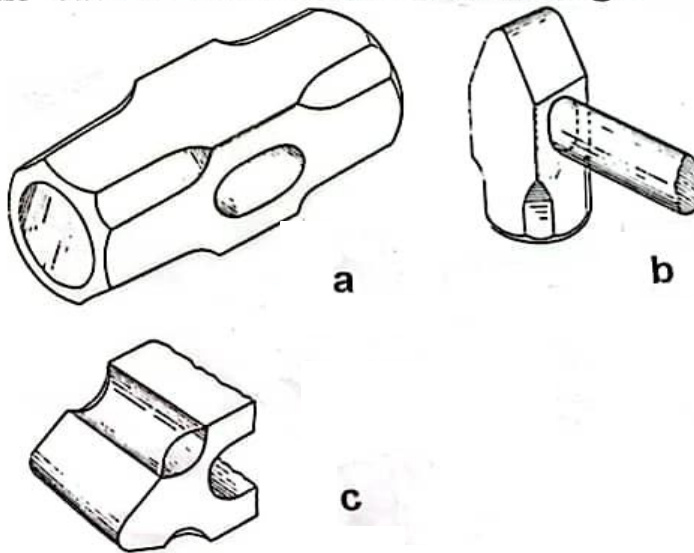
c. The advantages of cold working .....  
.....

d. The disadvantages of the blacksmith forging (free forging) .....  
.....  
.....

4. Label each part of the following blacksmith's forge:

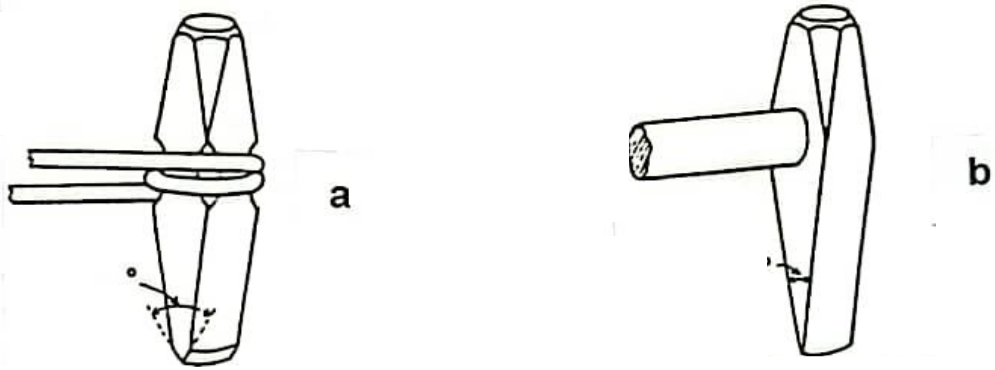


5. The following drawing shows different types of hammers uses in the forging workshops. Name each of them and mention its usage:



- a. ....using for.....
- b. ....using for.....
- c. ....using for.....

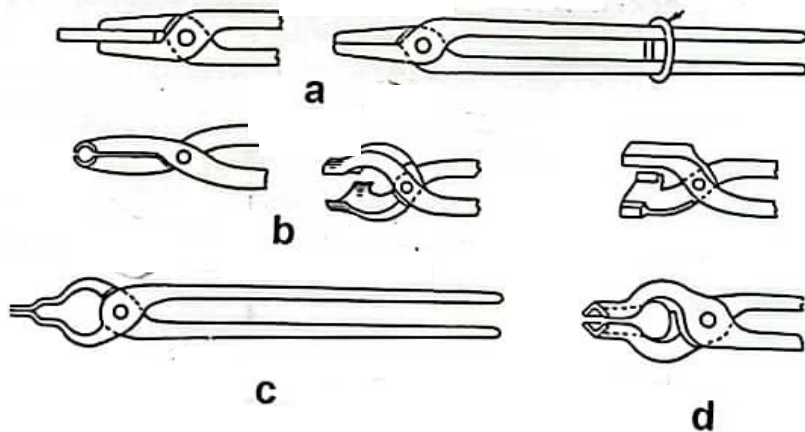
6. The following drawing shows the difference between the hot and the cold chisels uses in the forging workshops. Identify each of them and write the chisel angle on the drawing, and then mention the uses of the each of them:



a. ....chisel using for.....

b. ....chisel using for.....

7. Write the name of the each of the following blacksmith's tongs and mention its uses:



a. ....uses for.....

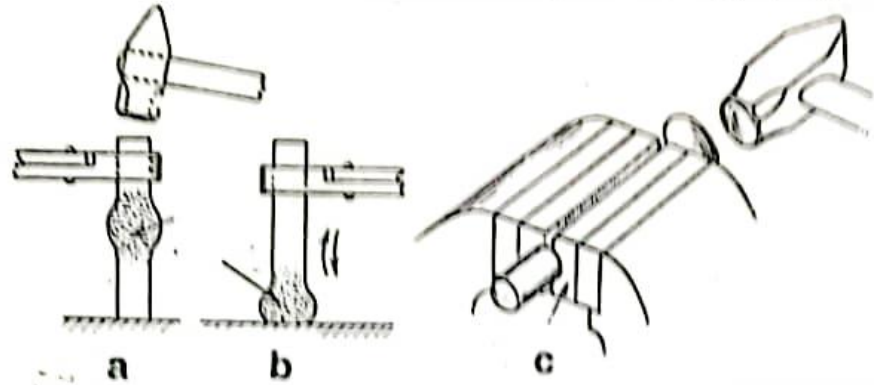
b. ....uses for.....

c. ....uses for.....

d. ....uses for.....



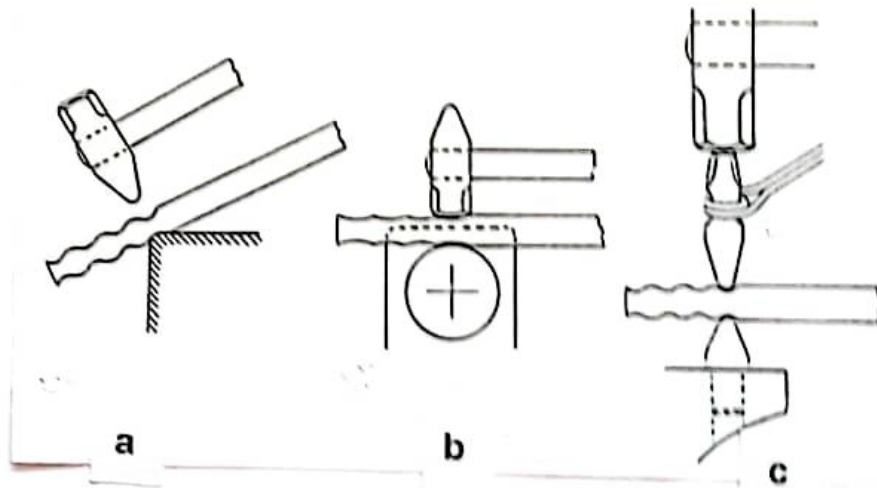
8. The figure given below shows a method of increasing the thickness of a bar at the expense of its length and is brought about by end pressure. Write the name of this operation, and then mention the different techniques of applying the pressure given in the figure:



The operation is .....

- a. ....  
 b. ....  
 c. ....

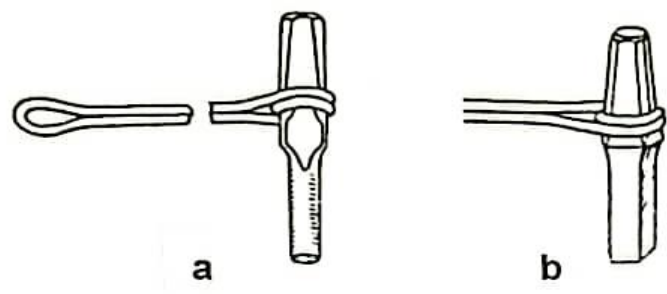
9. The figure given below shows a method of increasing the length of a bar at the expense of its width or thickness or both. Write the name of this operation, and then identify the different techniques of this operation:



The operation is .....

- a. ....  
 b. ....  
 c. ....

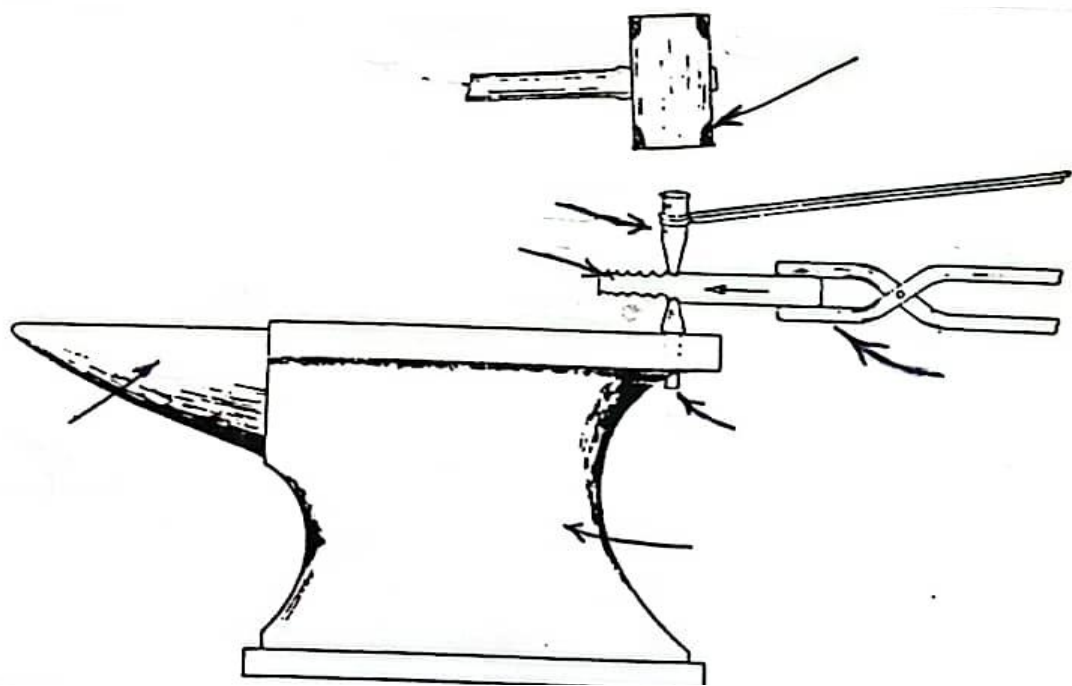
10. Write the name of the each of the following punches, and then write its uses:



a. ....uses for.....

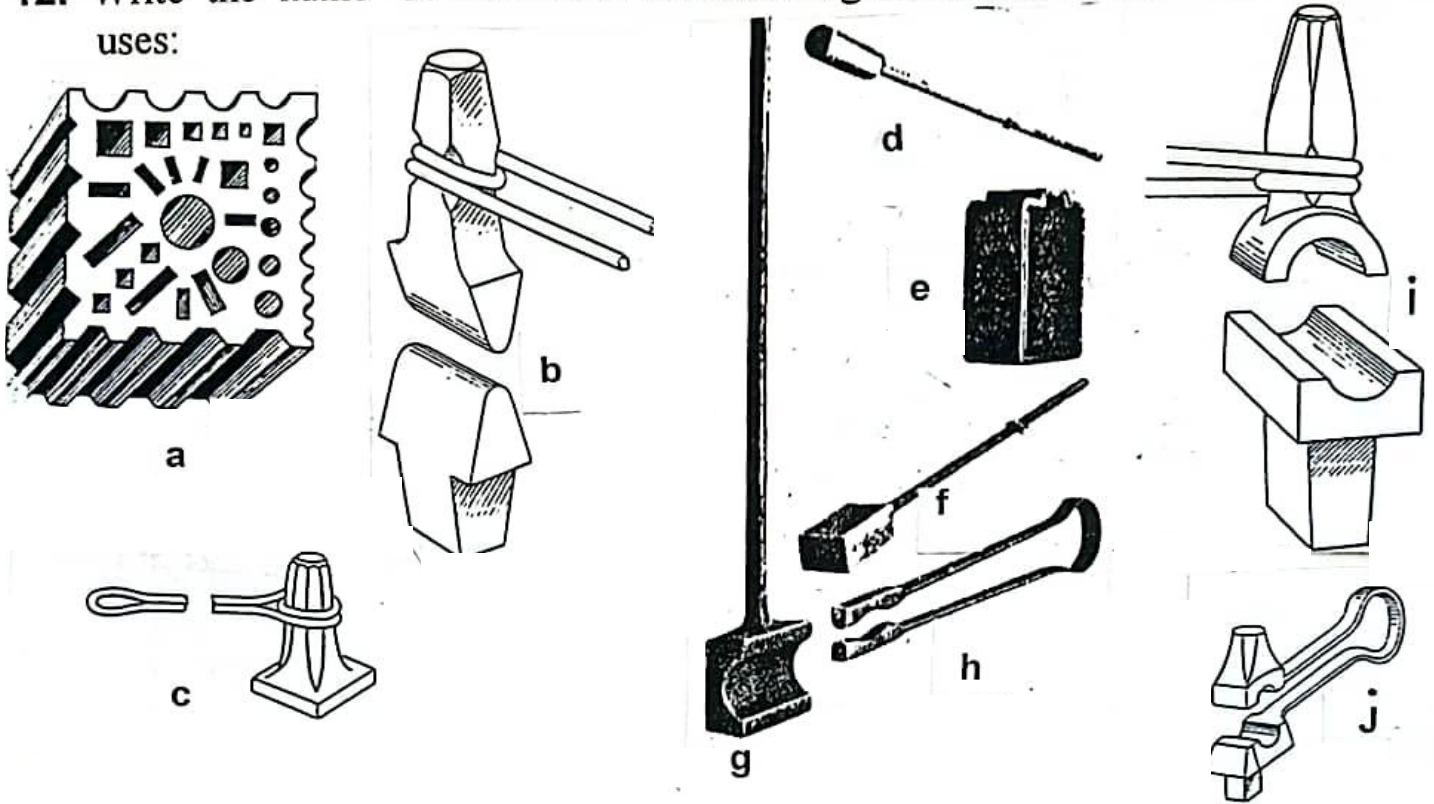
b. ....uses for.....

11. The figure given below shows an operation which is done on the forging workshop. Identify this operation, and then label each item:



The operation is .....

12. Write the name of each of the following blacksmith's tools and mention its uses:



a. ....uses for.....

b. ....uses for.....

c. ....uses for.....

d. ....uses for.....

e. ....uses for.....

f. ....uses for.....

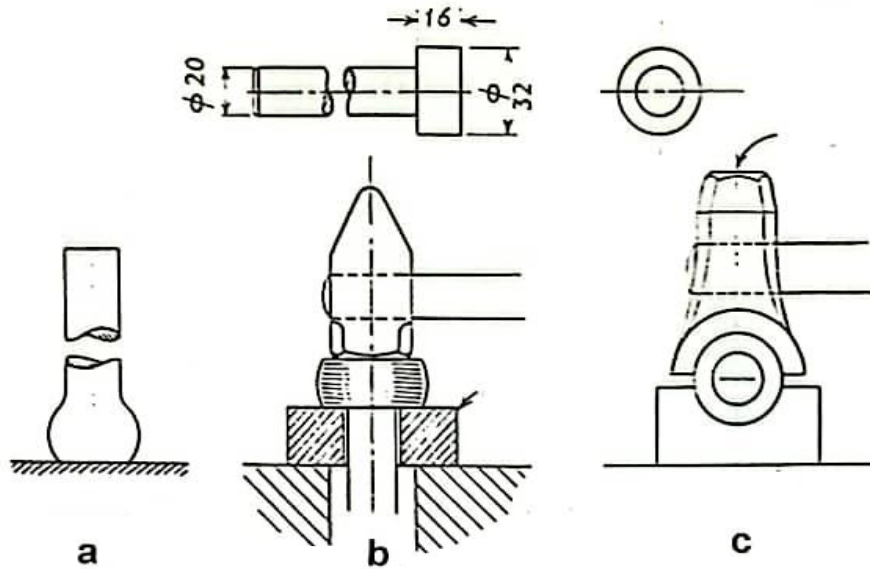
g. ....uses for.....

h. ....uses for.....

i. ....uses for.....

j. ....uses for.....

13. The figure given below shows making a head on a bar. State each process and mention the tools used:



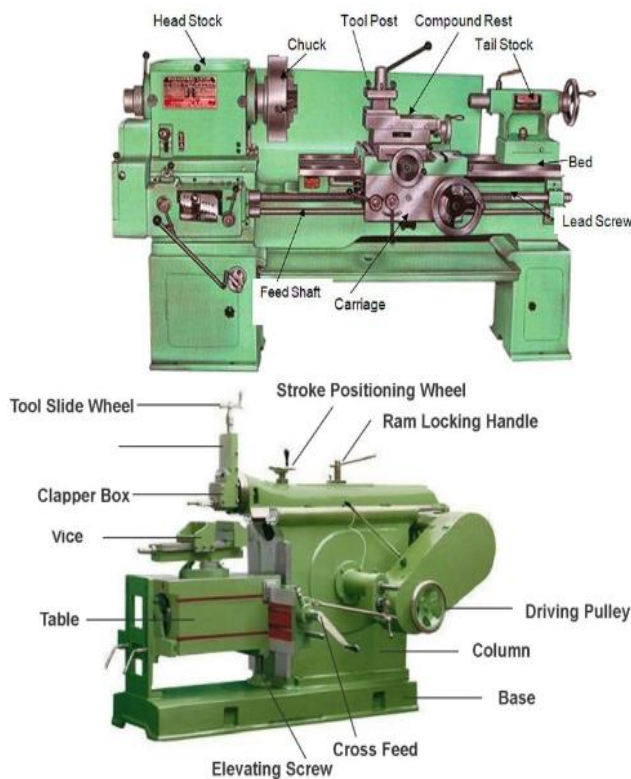
- a. Heat one end of the bar on .....
- b. ....
- c. ....
- d. ....

14. Draw the workpiece that you are produced in the workshop, and then complete the table:



## Report for:

# Machining Workshop



<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....



**Answer the following questions:**

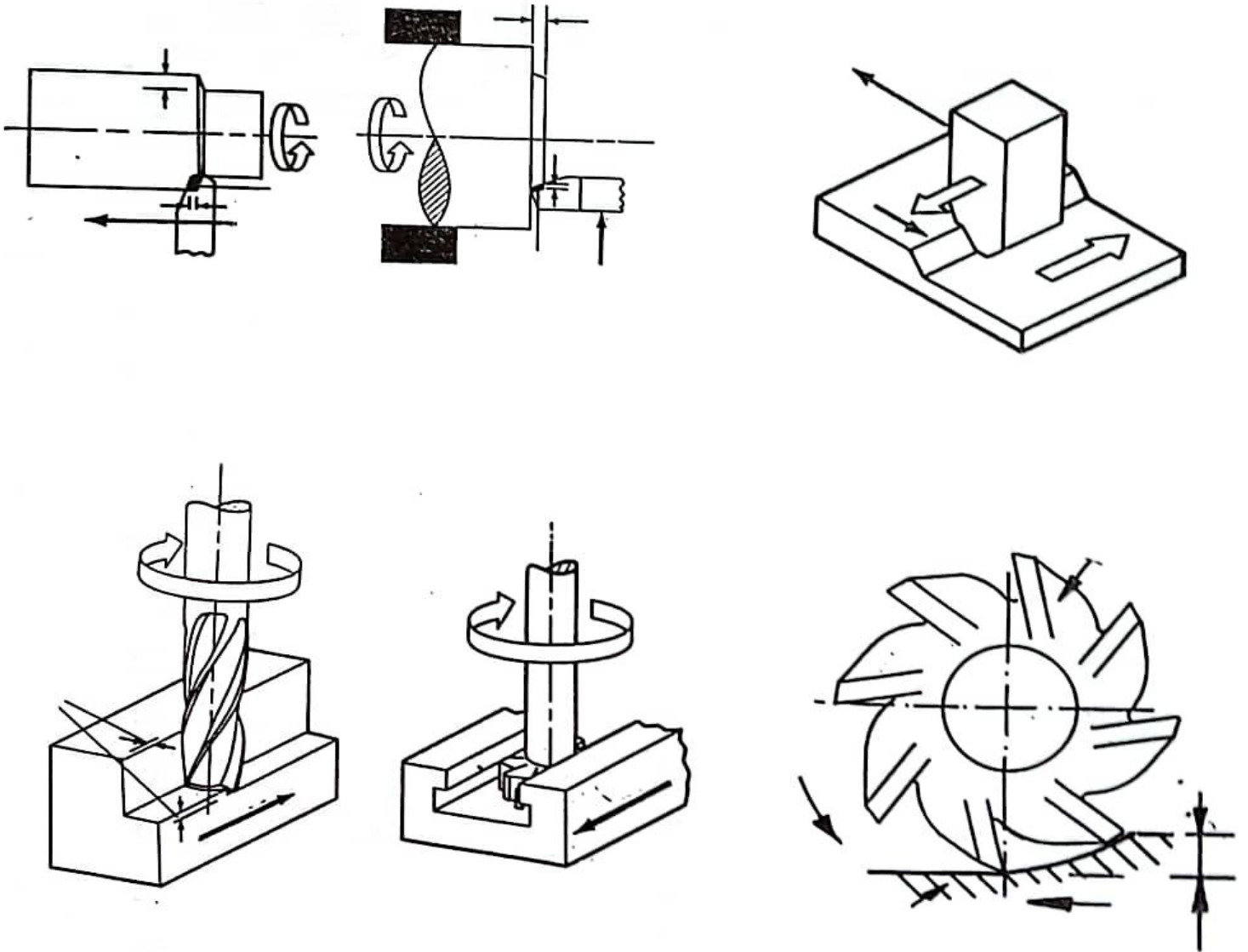
1. Using a suitable drawing scale, draw the layout of your machining workshop including the available machining equipment :  
[note: do not hesitate to mention or to add any further suggestions].

Layout of the machining workshop

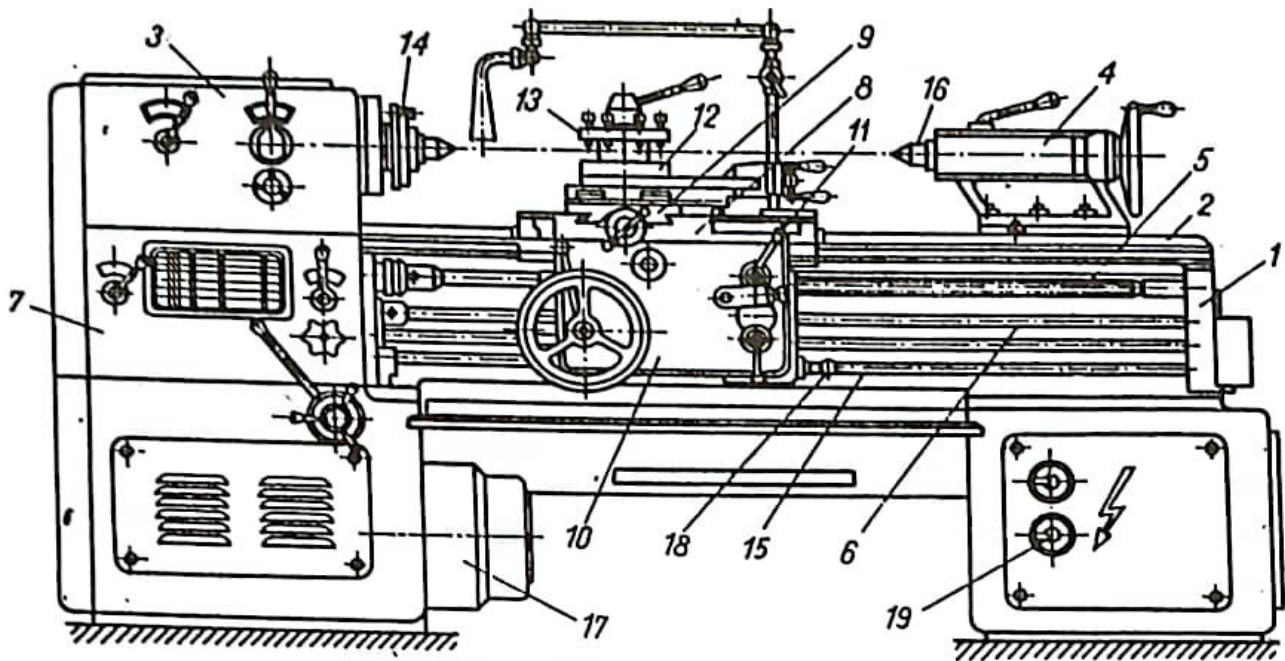
2. Identify the safety equipment in the machining workshop:

- a. ....
- b. ....
- c. ....
- d. ....
- e. ....
- f. ....
- g. ....

3. In the following figures, the main motions in turning, shaping and milling processes are shown. Write the missing labels for each.

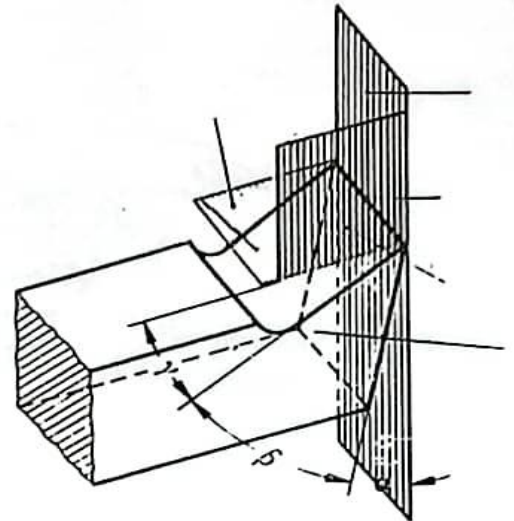
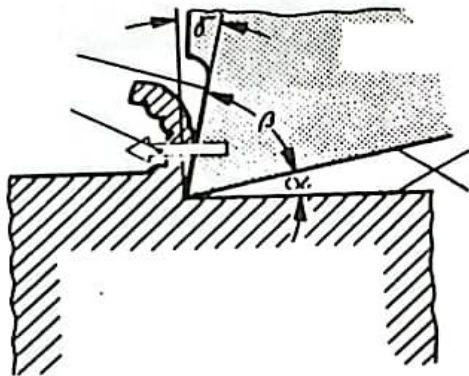


4. Name all the parts of the center-lathe shown in the figure below. Write any missing names.



- |          |          |
|----------|----------|
| 1. ....  | 2. ....  |
| 3. ....  | 4. ....  |
| 5. ....  | 6. ....  |
| 7. ....  | 8. ....  |
| 9. ....  | 10. .... |
| 11. .... | 12. .... |
| 13. .... | 14. .... |
| 15. .... | 16. .... |
| 17. .... | 18. .... |
| 19. .... | 20. .... |
| 21. .... | 22. .... |
| 23. .... | 24. .... |

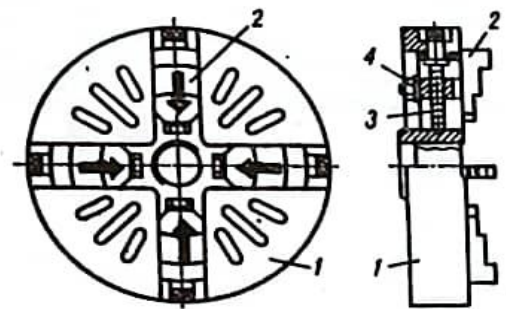
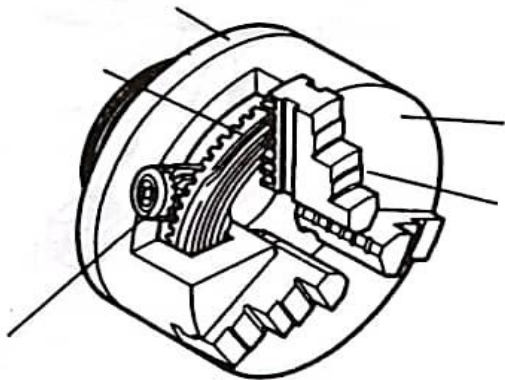
5. The shown sketches are of general cutting tools showing their main angles. Write the name of these angles.



$\alpha$  is the ..... angle,  
 $\gamma$  is the ..... angle

$\beta$  is the ..... angle

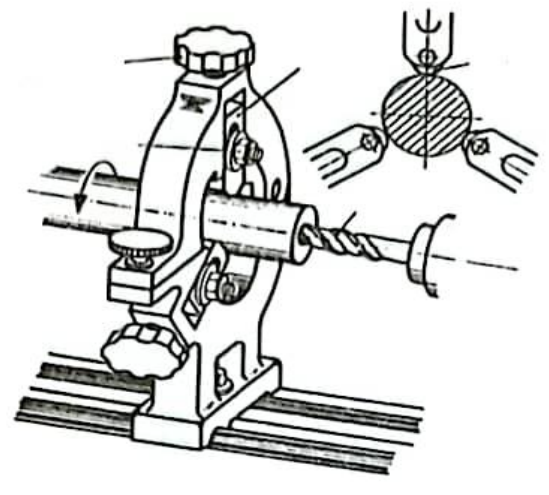
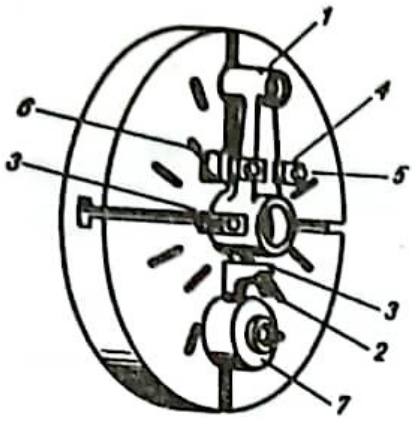
6. The following items are used with the center-lathe, identify each of them stating their use. Name their main parts of each if are needed.



a. ....  
 it uses for .....  
 .....  
 .....

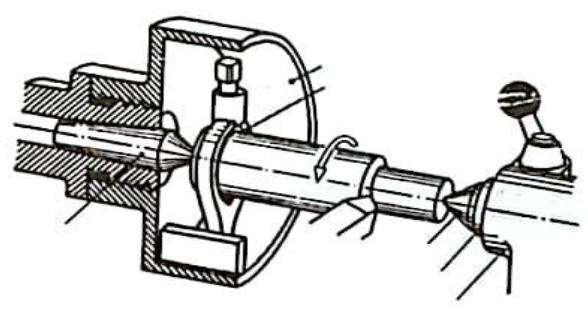
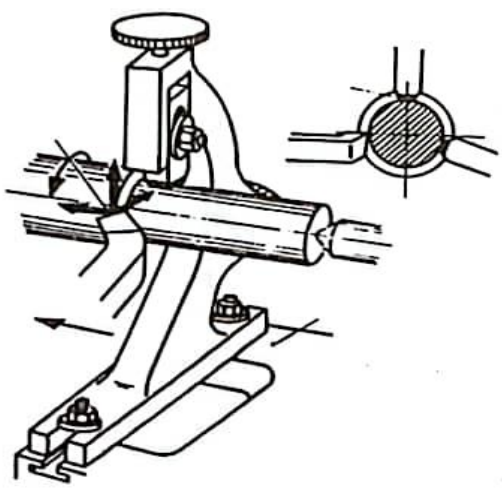
b. ....  
 it uses for .....  
 .....  
 .....





c. ....  
 it uses for .....  
 .....  
 .....

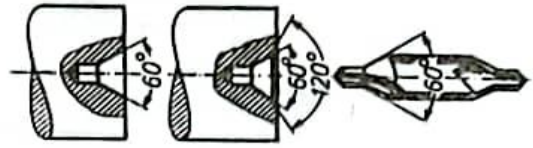
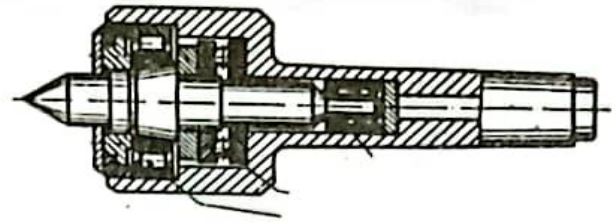
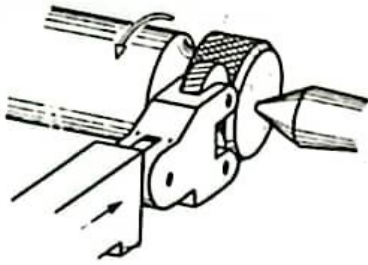
d. ....  
 it uses for .....  
 .....  
 .....



e. ....  
 it uses for .....  
 .....  
 .....

f. ....  
 it uses for .....  
 .....  
 .....

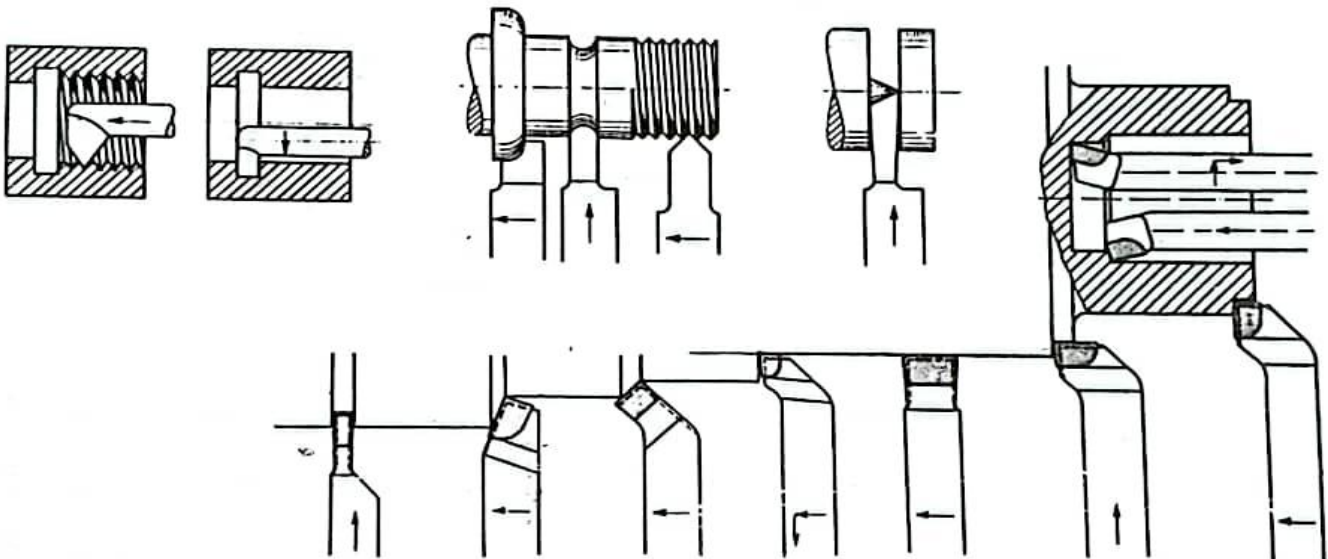




g. ....  
 it uses for .....

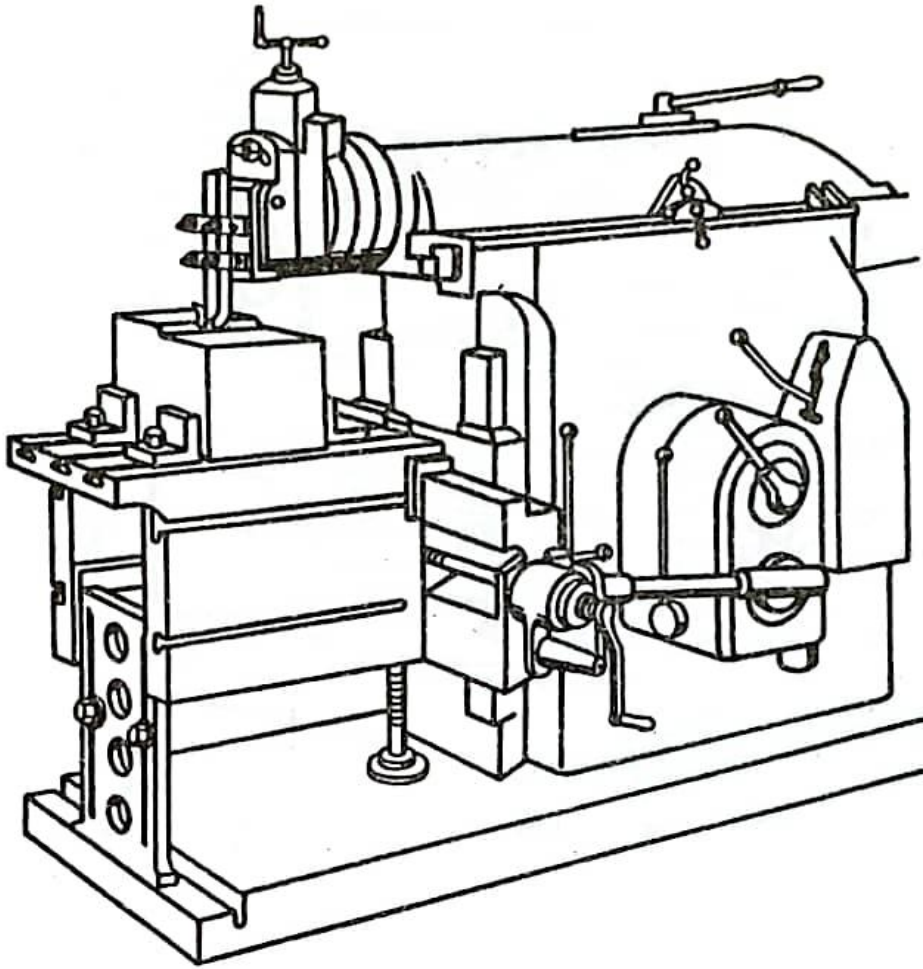
h. ....  
 it uses for .....

7. The following tools are used with the center-lathe, identify each of them:



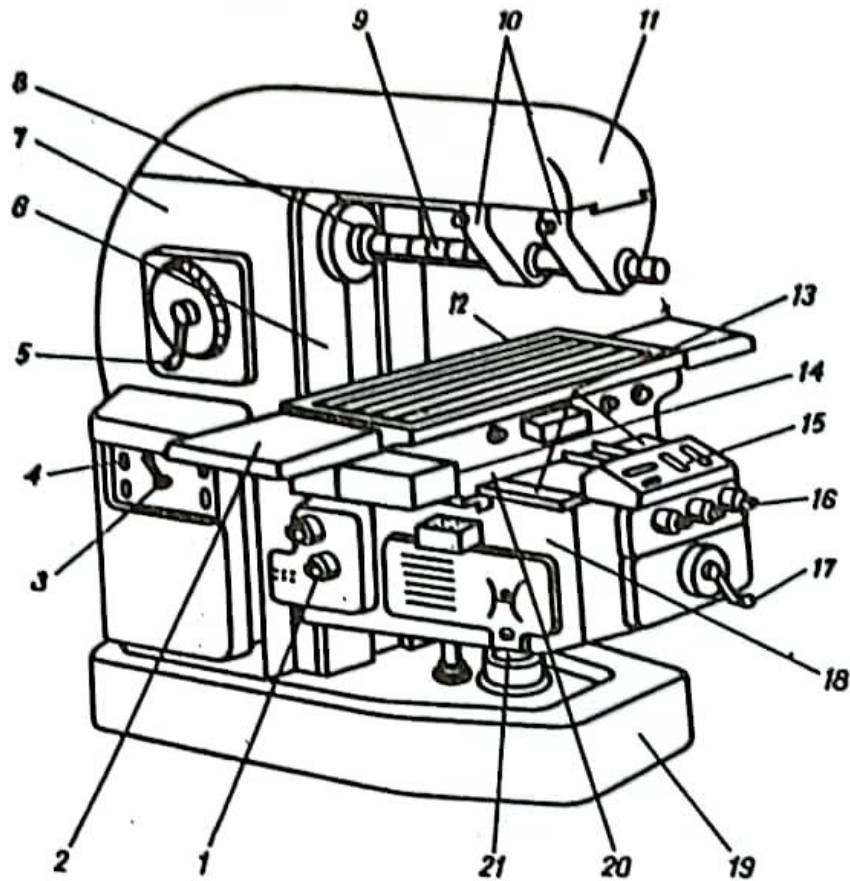
- |          |          |
|----------|----------|
| 1. ....  | 2. ....  |
| 3. ....  | 4. ....  |
| 5. ....  | 6. ....  |
| 7. ....  | 8. ....  |
| 9. ....  | 10. .... |
| 11. .... | 12. .... |
| 13. .... | 14. .... |

8. Number and name all the parts of the shaping machine shown in the figure below:



- |          |          |
|----------|----------|
| 1. ....  | 2. ....  |
| 3. ....  | 4. ....  |
| 5. ....  | 6. ....  |
| 7. ....  | 8. ....  |
| 9. ....  | 10. .... |
| 11. .... | 12. .... |
| 13. .... | 14. .... |
| 15. .... | 16. .... |
| 17. .... | 18. .... |
| 19. .... | 20. .... |

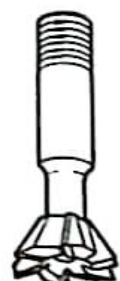
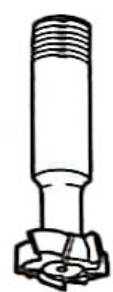
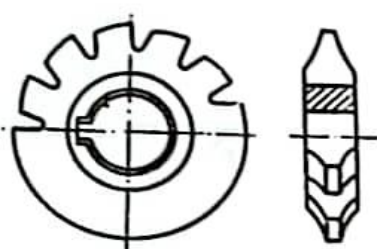
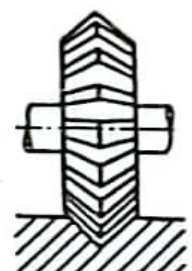
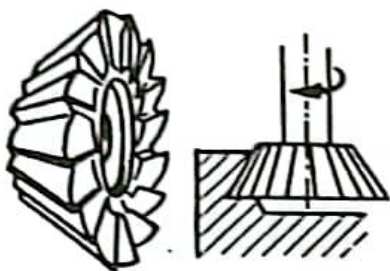
9. Name all the parts of the milling machine shown in the figure below:



- |          |          |
|----------|----------|
| 1. ....  | 2. ....  |
| 3. ....  | 4. ....  |
| 5. ....  | 6. ....  |
| 7. ....  | 8. ....  |
| 9. ....  | 10. .... |
| 11. .... | 12. .... |
| 13. .... | 14. .... |
| 15. .... | 16. .... |
| 17. .... | 18. .... |
| 19. .... | 20. .... |
| 21. .... | 22. .... |



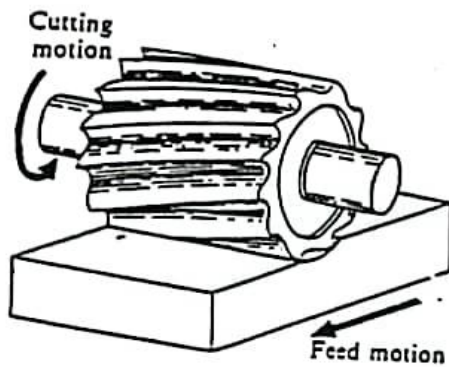
10. Identify the milling cutters shown below. Write the name of each cutter in the numbered spaces provided:



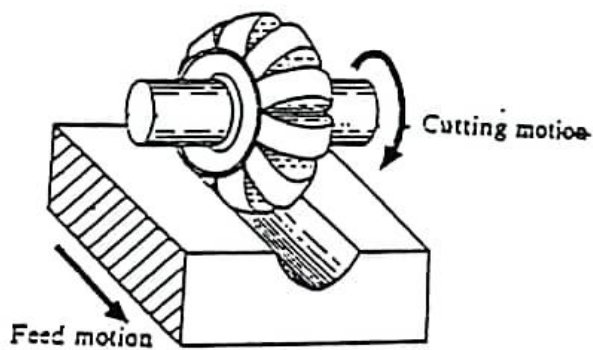
- 1. ....
- 3. ....
- 5. ....
- 7. ....
- 9. ....
- 11. ....
- 13. ....

- 2. ....
- 4. ....
- 6. ....
- 8. ....
- 10. ....
- 12. ....
- 14. ....

5) The following Figures show two examples of horizontal milling operations. Identify them.



(a) .....

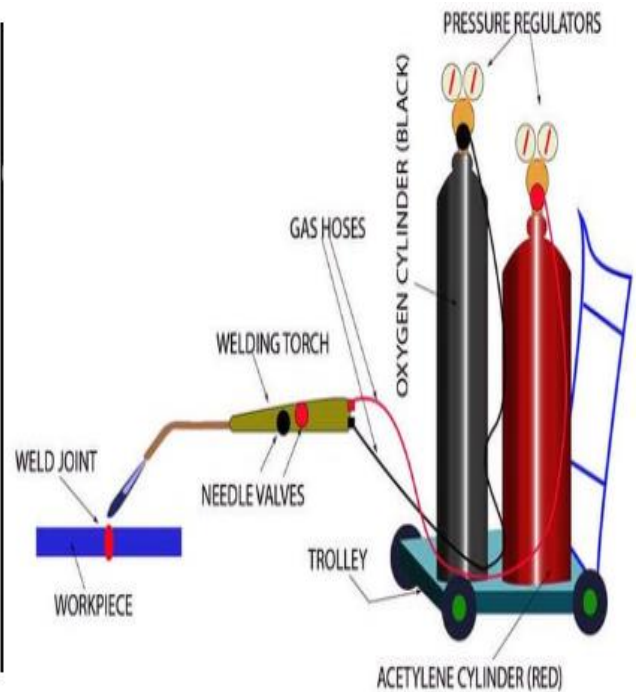
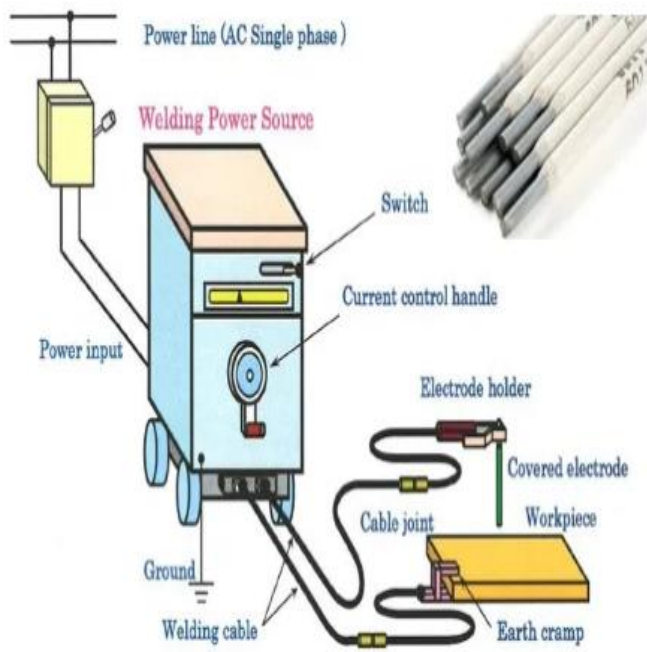


(b) .....



## Report for:

# Welding Workshop



<b>Student Name:</b>	.....
<b>Student No.:</b>	.....
<b>Group:</b>	.....
<b>Semester:</b>	.....
<b>Checked by:</b>	.....
<b>Mark:</b>	.....

2. Identify the safety equipment in the welding workshop:

- a. ....
- b. ....
- c. ....
- d. ....
- e. ....
- f. ....
- g. ....

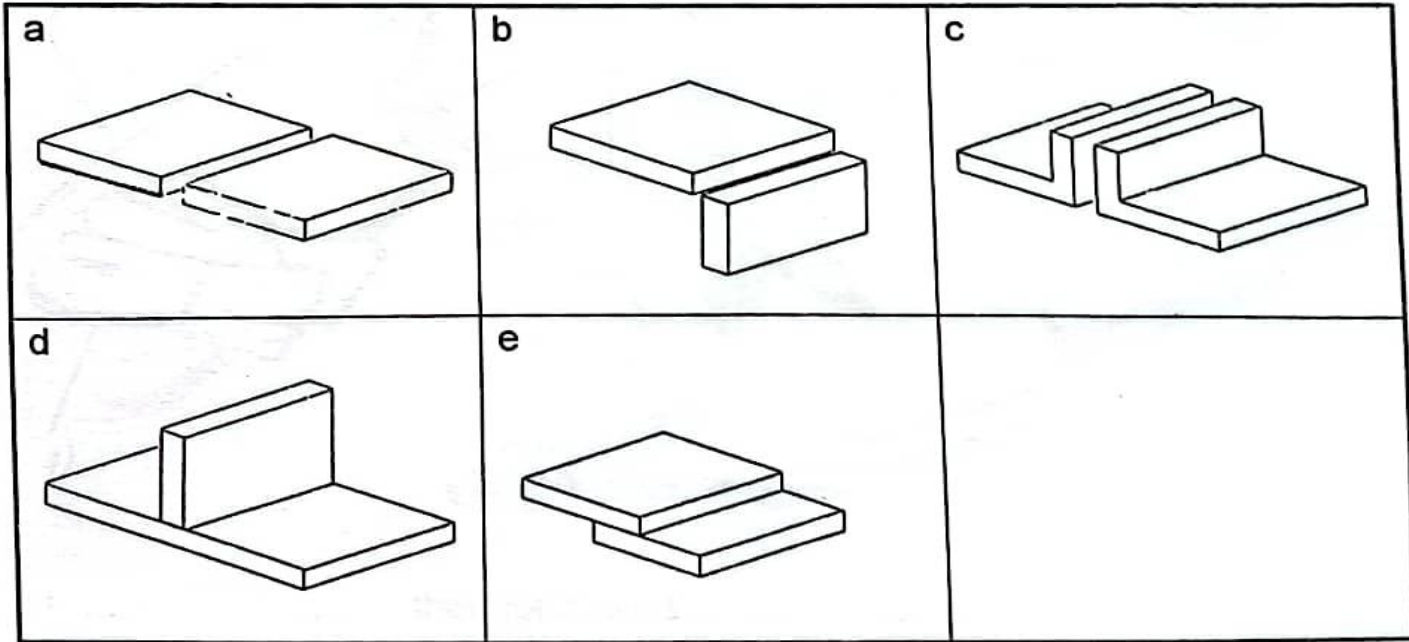
3. Define the welding process:

The welding process is .....

.....

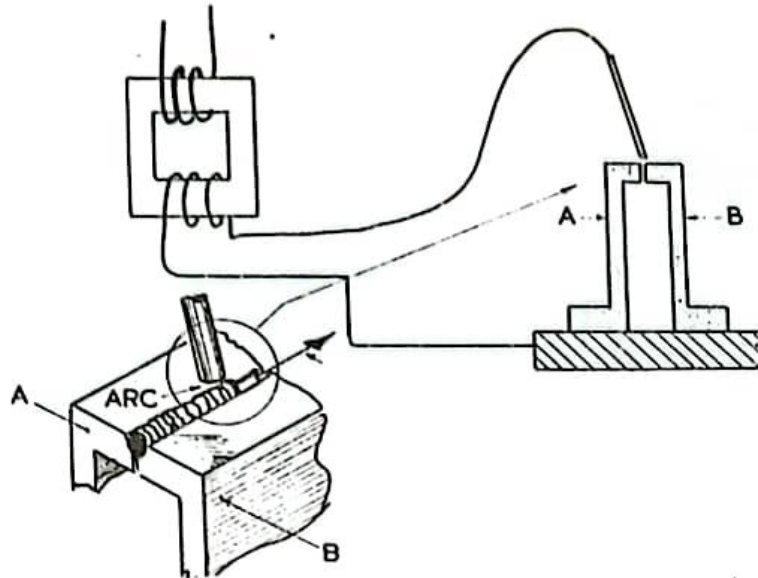
.....

4. The following are the drawing of the basic types of the welded joints, name each of them:

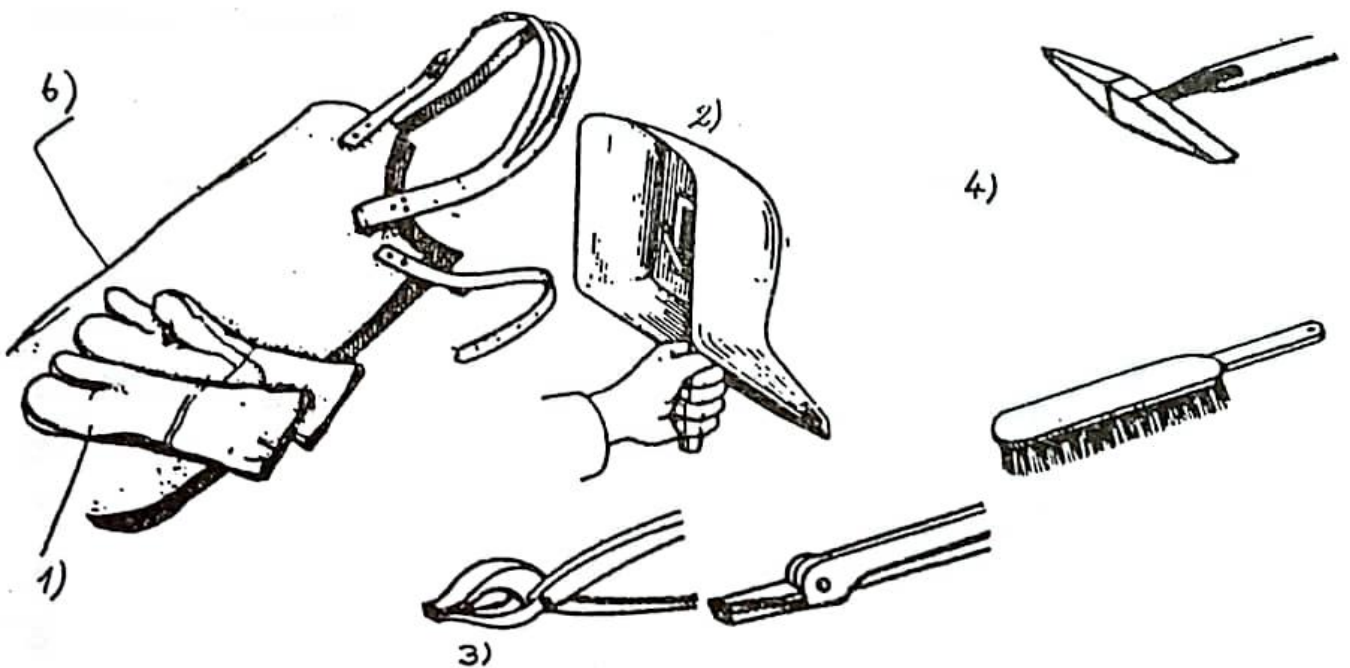


- a. ....
- b. ....
- c. ....
- d. ....
- e. ....

5. The following figure shows a schematic sketch for the arc welding circuit. Write the missing labels for its main components.

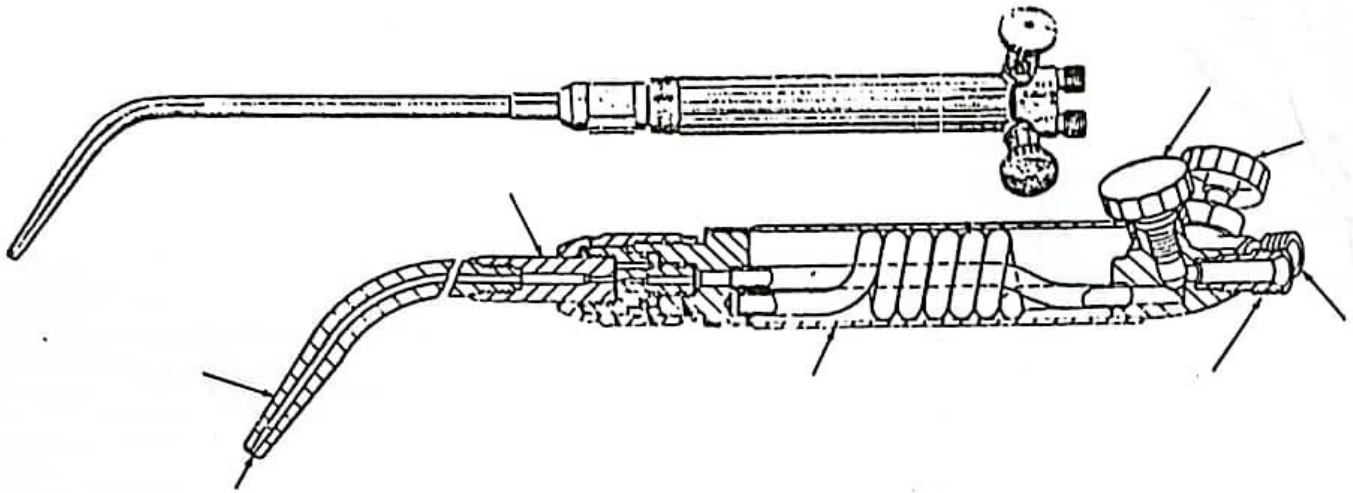


6. In the following figure, some welding accessories are drawn. Write their names and functions.



1. .... their function is .....
2. .... its function is .....
3. .... their function is .....
4. .... its function is .....
5. .... its function is .....
6. .... its function is .....

7. Identify the different parts of the following cross-sectional views of the typical welding torch.



8. Identify the different parts of the following cross-sectional view of the typical acetylene cylinder:

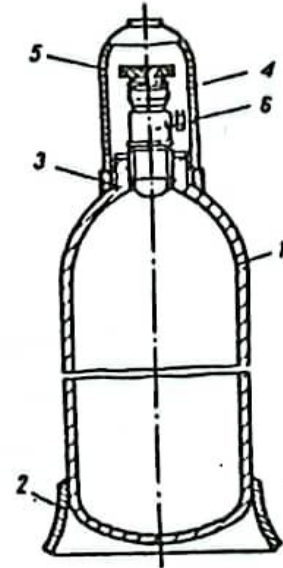
1. ....
2. ....
3. ....
4. ....
5. ....





9 The following is a cross-sectional view of a typical oxygen cylinder. Name the different parts of it:

1. ....
2. ....
3. ....
4. ....
5. ....
6. ....



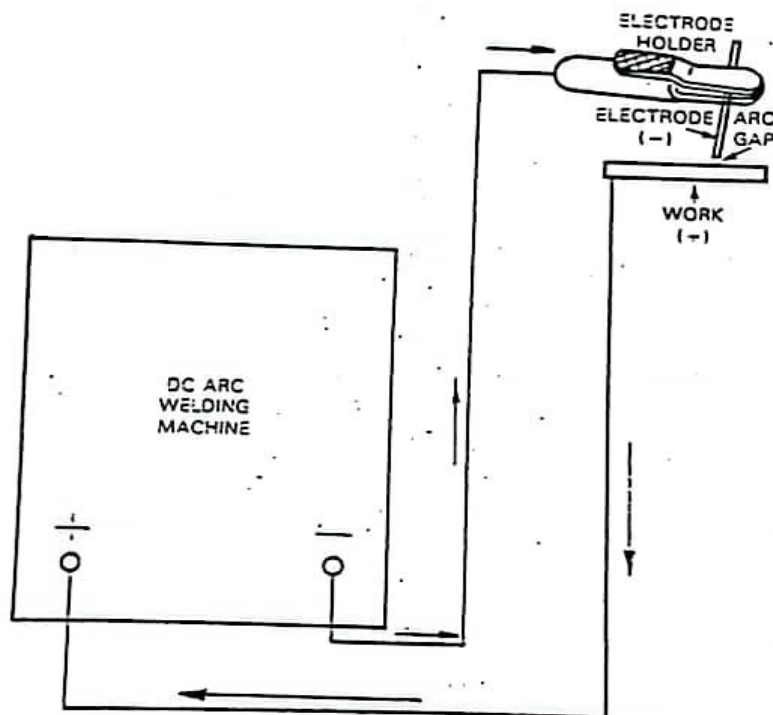
10. The following are the drawing of the different types of oxyacetylene flame. Name each one of them and state the mixing ratio of each type:

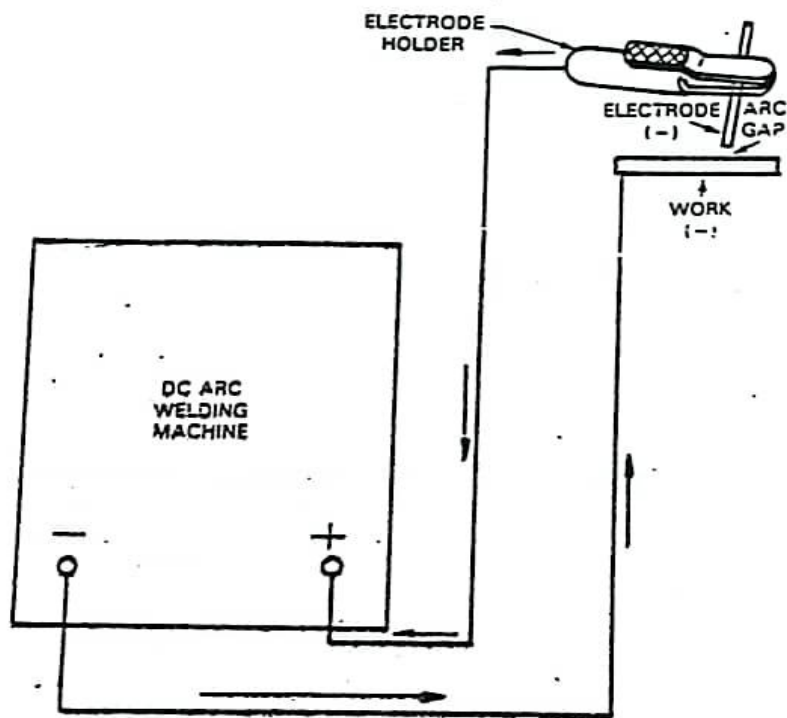


1. ....
2. ....
3. ....



- 3) A wiring diagrams for a direct current electrode arc welding circuit are shown below. Differentiate between them from the point of view of polarity.





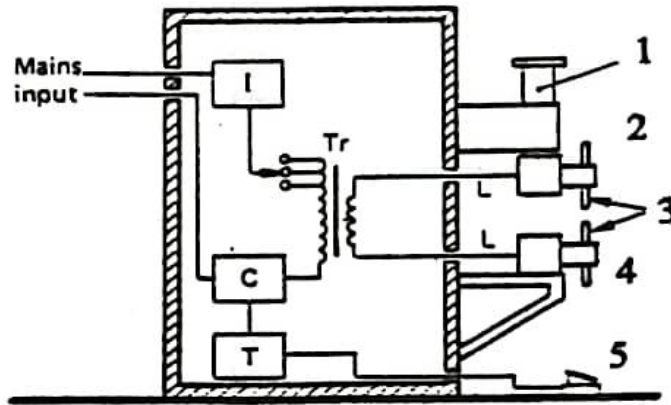
1) State the principles of resistance welding.

.....  
.....  
.....

2) Resistance welding covers a number of processes which are:

- a- .....
- b- .....
- c- .....
- d- .....
- e- .....
- f- .....
- g- .....
- h- .....

3) The following Figure shows the principal components of a resistance spot welder. Identify the mentioned parts.

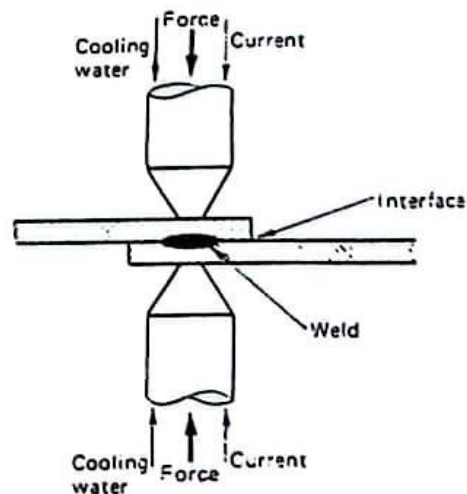


C- on/off contactor; T- timer; Tr- transformer;  
 L- flexible leads connecting transformer to electrodes;  
 I- ignitrons or thyristors to control current.

1. ....
2. ....
3. ....
4. ....
5. ....

4) Draw the sequence in the resistance spot welding process.

5) The following is a schematic diagram of resistance spot welding. Explain how to obtain a good bond in the weld nugget.





6) Differentiate between spot welding and seam welding.

Spot welding	Seam welding
1. ....	1. ....
2. ....	2. ....

7) The flash welding process is suitable for end-to-end or edge-to-edge joining of similar or dissimilar metals. This process is used to repair broken band-saw blades. Draw a schematic diagram illustrating the flash welding process.

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