



Lecture on
Introduction of Engineering Drawing

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Engineering Drawing

Course No: ME 1130

Course Name: Engineering Graphics

Text Book

Textbook of Engineering Drawing by K. Venkata Reddy

Reference Books:

1. C.M. Agarwal, Basant Agarwal, “Engineering Drawing”, Tata Mc Graw Hill.
2. K. Venugopal, “Engineering Drawing and Graphics”. New Age Publications.

Engineering Drawing

TOPICS

- ❖ Graphics language
- ❖ Engineering drawing
- ❖ Traditional Drawing Tools

Engineering Drawing

Drawing

Describing any object/ information diagrammatically.

Engineering Drawing

Engineering Drawing is the language for Engineers.

It can be presented as drawing of an object contains all the necessary information, required for the construction/fabrication of the object, like

- **actual shape,**
- **accurate sizes,**
- **manufacturing methods,**
- **materials to be used etc.**

Engineering Drawing

Elements of Engineering Drawing

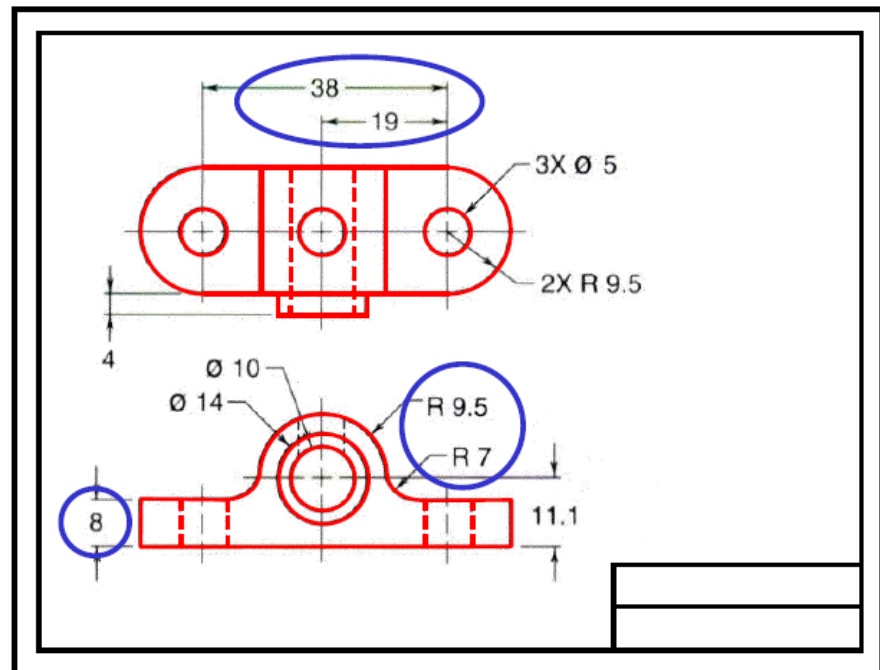
Engineering drawing are made up of **graphics language** and **word language**.

Graphics language

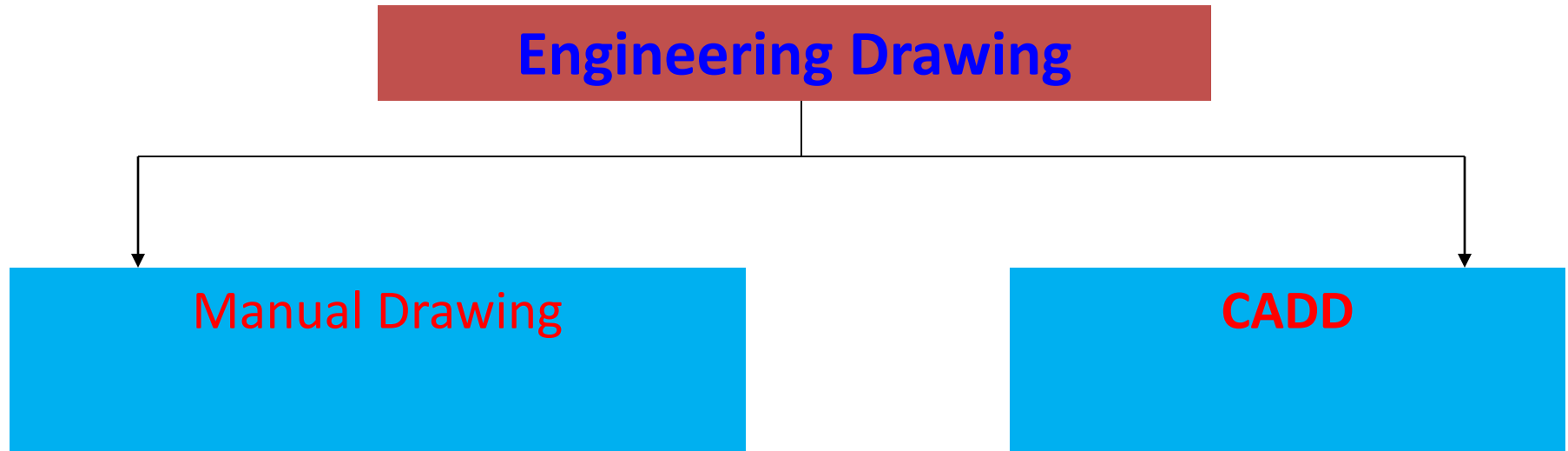
Describe a shape (mainly).

Word language

Describe size, location and specification of the object.



Engineering Drawing



Computer has a major impact on the methods used to design and create technical drawings.

Design and drafting on computer are cheap and less time consuming.

Why we go for manual drawing?

Engineering Drawing

Why we go for manual drawing?

Computer cannot replace the drafting board and equipment as a learning tool.

Once you have learned the basics of mathematics, now after class 12, you are allowed the use of calculator and computer.

If basic fundamentals are clear, better use can be made of the power of the software.

To be an expert in technical drawing, this first course on Engineering (manual) Drawing is the first step.

GRAPHICS LANGUAGE

Effectiveness of Graphics Language

1. Try to write a description of this object.
 2. Test your written description by having someone attempt to make a sketch from your description.
-



You can easily understand that ...

The word languages are inadequate for describing the **size**, **shape** and **features** completely as well as concisely.

Composition of Graphic Language

Graphic language in “**engineering application**” use **lines** to represent the **surfaces**, **edges** and **contours** of objects.

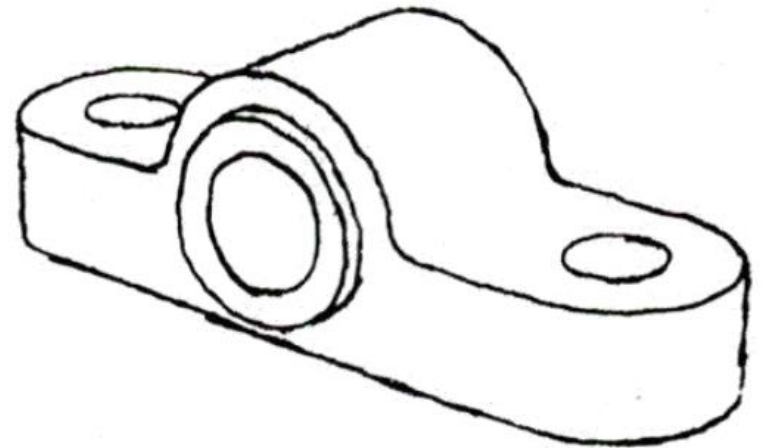
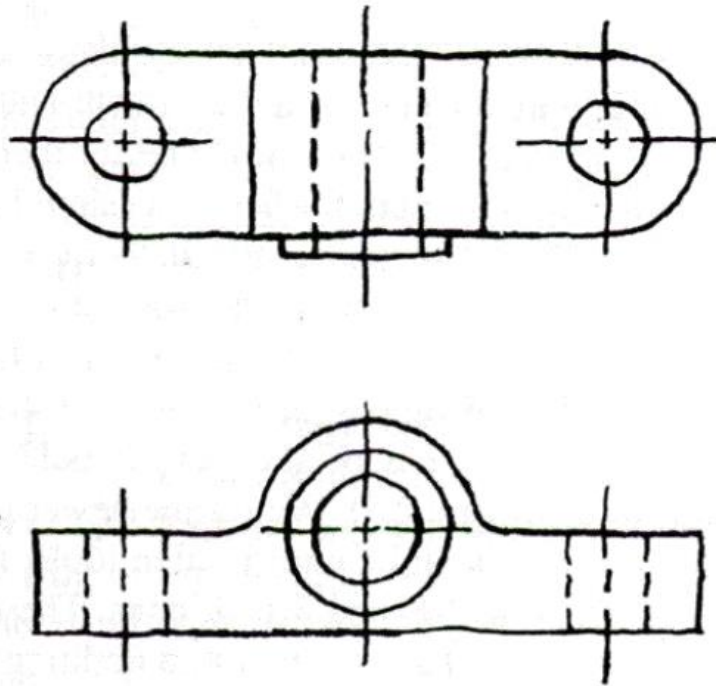
- The language is known as “**drawing**” or “**drafting**” .
- A drawing can be done using **freehand**, **instruments** or **computer** methods.

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Freehand drawing

The lines are sketched without using instruments other than pencils and erasers.

Example

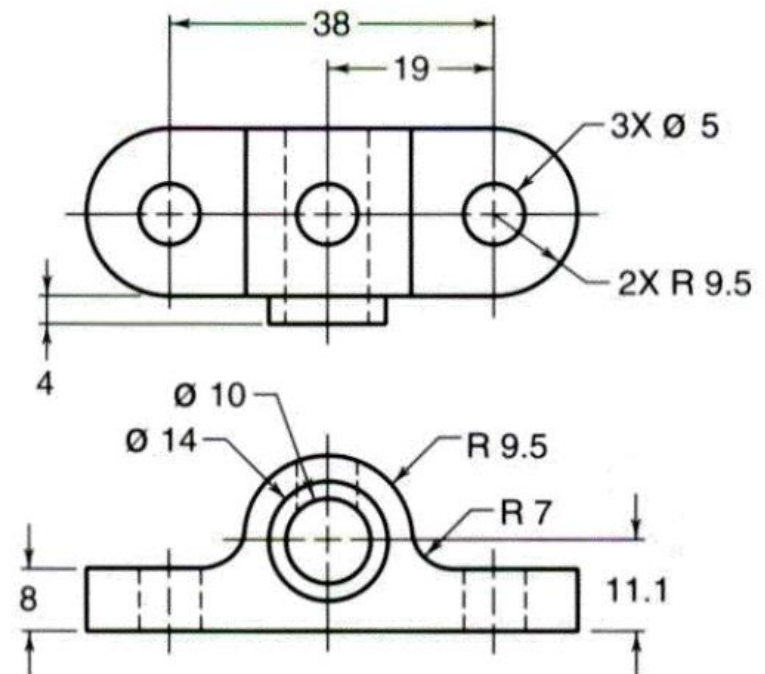


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Instrument drawing

Instruments are used to draw straight lines, circles, and curves concisely and accurately. Thus, the drawings are usually made to scale.

Example



Engineering Drawing

Computer drawing

The drawings are usually made by commercial software such as AutoCAD, solid works etc.

Example



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**Traditional
Drawing Tools**

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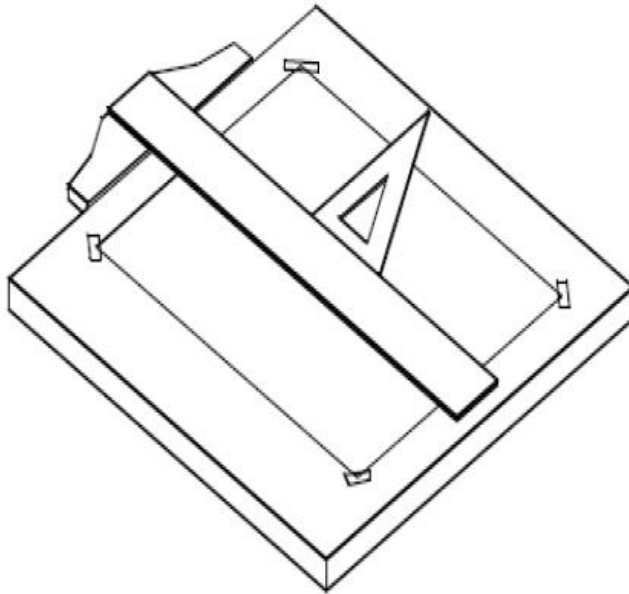
Traditional Drawing Tools

Items required for drawing

1. Drawing board
2. Mini-drafter/drafting machine/ T- square
3. Instrument box containing compass, divider, etc.
4. Drawing clip/pin/adhesive tape
5. Drawing pencils
6. Protractor
7. Scales
8. French curves
9. Eraser
10. Sharpener and Duster
11. Drawing sheet

Engineering Drawing

DRAWING TOOLS

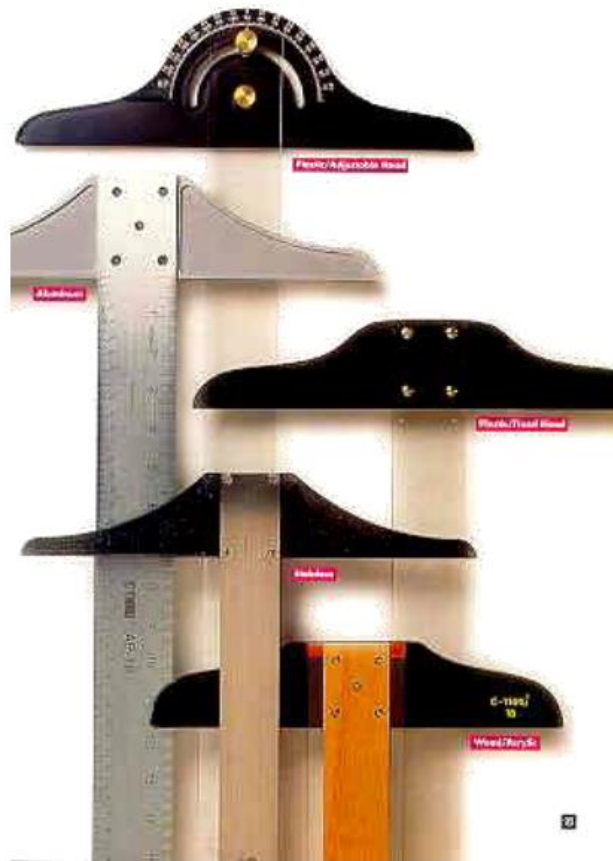


1. Drawing Board

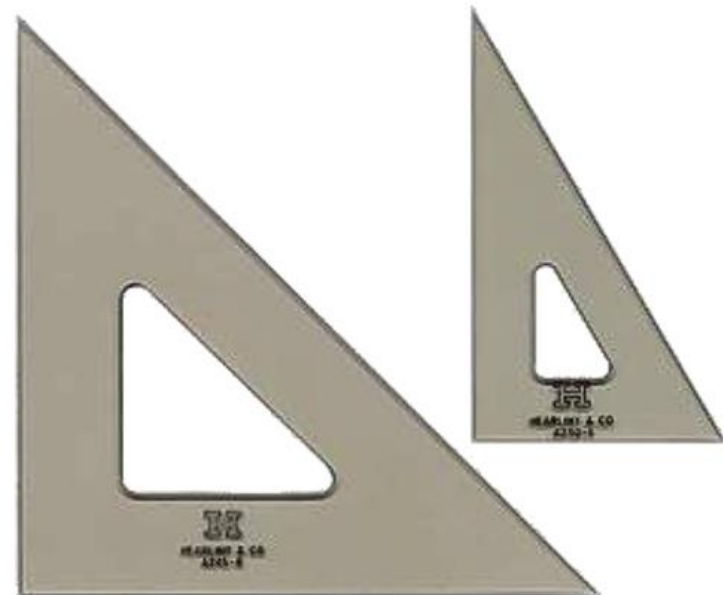


2. Mini Drafter

DRAWING TOOLS



3. T-Square



4. Triangles

DRAWING TOOLS



5. Adhesive Tape



2H or HB for thick line
4H for thin line



6. Pencils

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Drawing Pencils

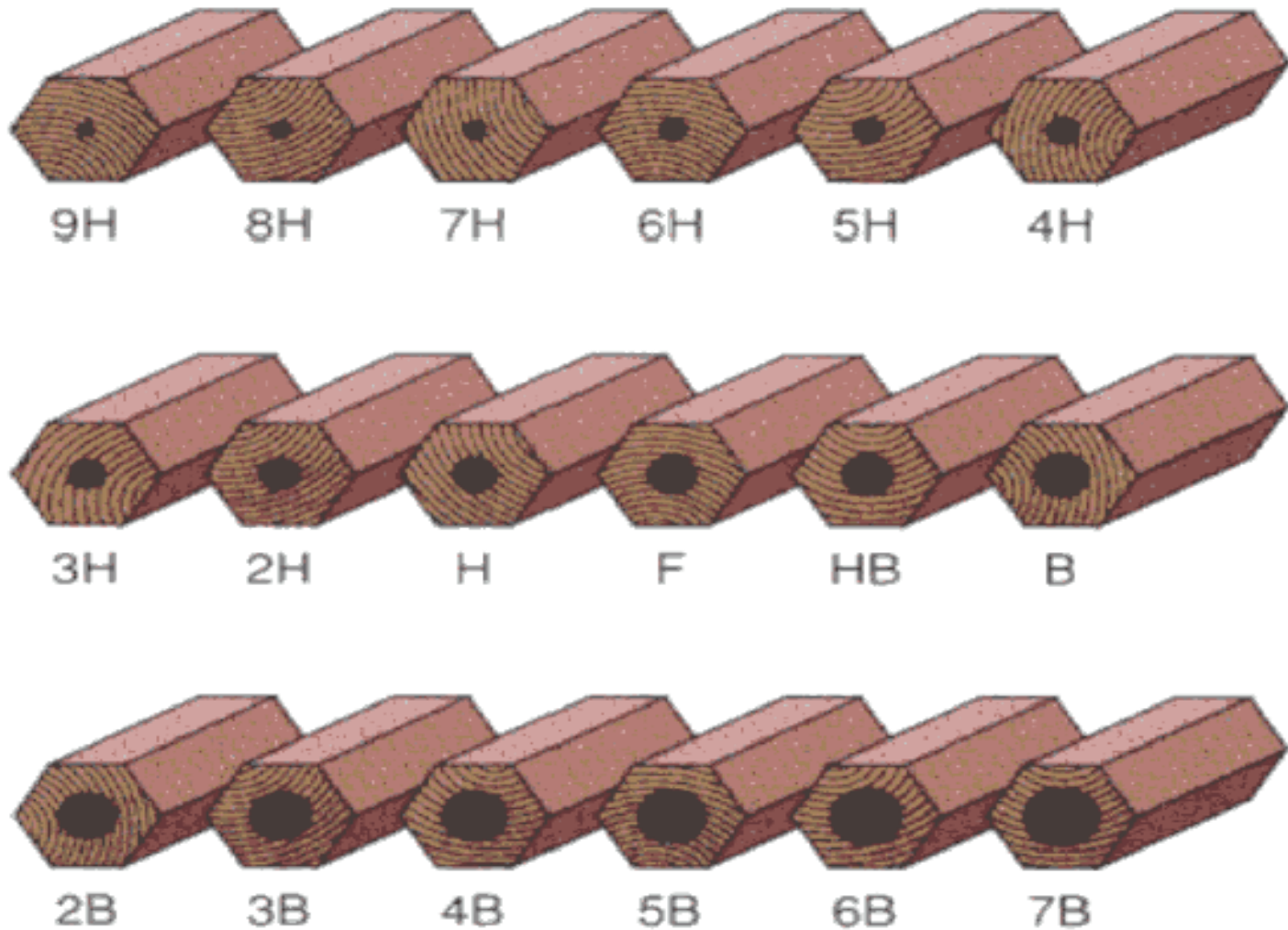


Wooden pencils - are graded and designated by numbers and letters

- 7B, 6B, 5B, 4B, 3B, 2B, B - in decreasing order of softness and blackness
- HB to F - Medium grade
- H, 2H, 3H, 4H, 5H, 6H, 7H, 8H, 9H - increasing order of hardness.

Drawings are done using 2H pencils and finished with H and HB pencils - to be practiced in this course.

Engineering Drawing



Grades and designation of wooden pencils

Engineering Drawing

Pencil drawing -





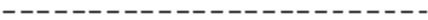
In finished drawing, all lines (except construction lines- used to construct the drawing) should be dense, clean and uniform.

Construction line should be drawn very thin and should be hardly visible in the finished drawing (**they should not be erased**).

Line group, mm	Thickness	Lines
0.2	Medium	Outlines, dotted lines, cutting plane lines
0.1	Thin	Center lines, section lines, dimension lines, extension lines, construction lines, leader lines, short-break lines, long-break lines




Engineering Drawing

Line types

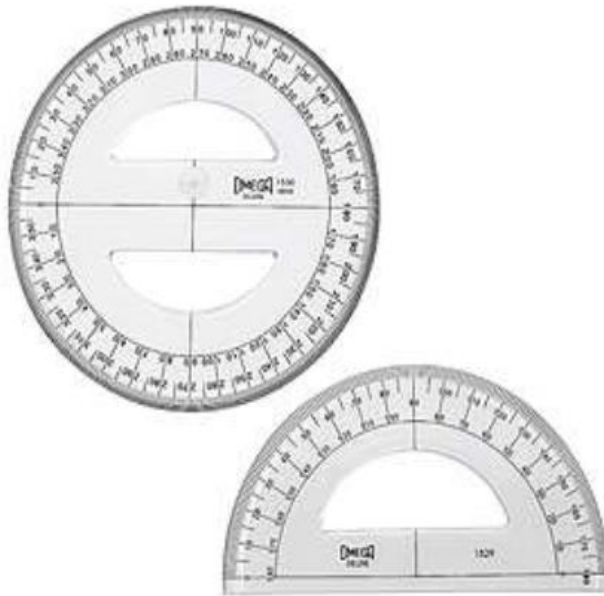
Illustration	Application	Pencil
Thick 	Outlines, visible edges, surface boundaries of objects, margin lines	H
Continuous thin 	Dimension lines, extension lines, section lines leader or pointer lines, construction lines, boarder lines	2H
Continuous thin wavy 	Short break lines or irregular boundary lines – drawn freehand	2H
Continuous thin with zig-zag 	Long break lines	2H
Short dashes, gap 1, length 3 mm 	Invisible or interior surfaces	H

Engineering Drawing

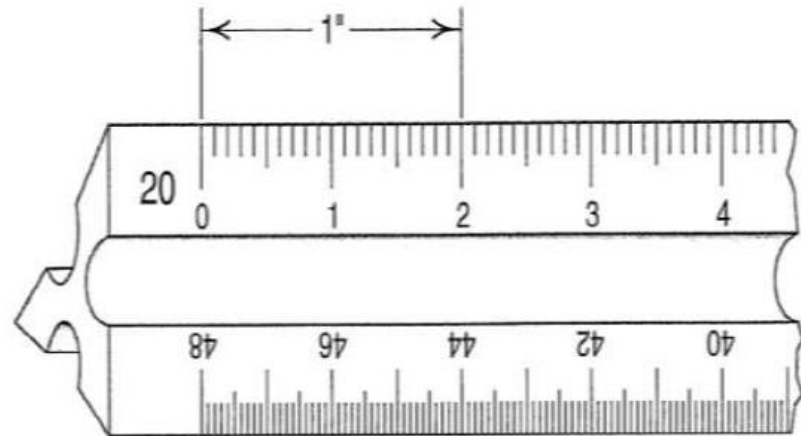
Line types....CONTD

Illustration	Application	Pencil
Short dashes 	Center lines, locus lines Alternate long and short dashes in a proportion of 6:1,	2H
Long chain thick at end and thin elsewhere 	Cutting plane lines	H / 2H
Continuous thick border line 	Border	HB

DRAWING TOOLS



7. Protector

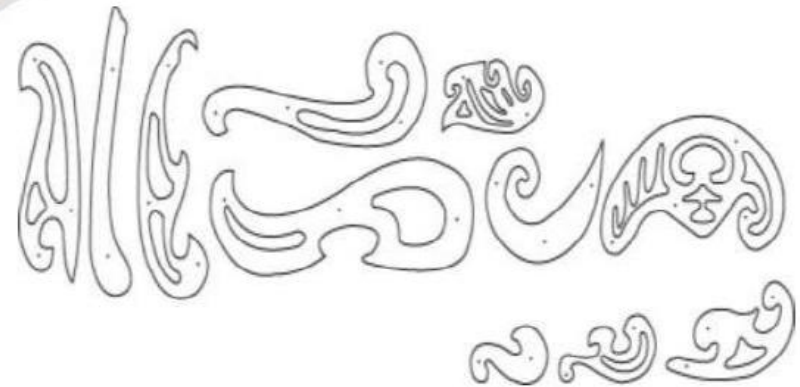


8. Scale

DRAWING TOOLS



9. Roller Scale



10. French curve

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DRAWING TOOLS



11. Sandpaper



12. Compass

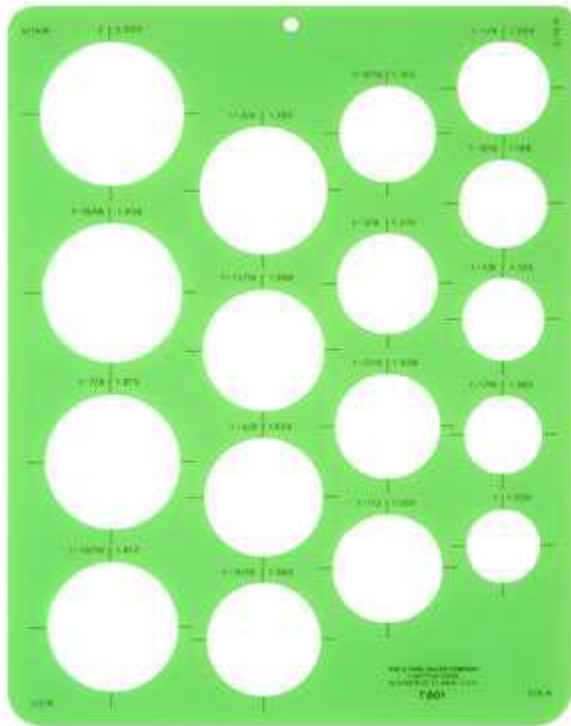
Engineering Drawing



Drawing Clip



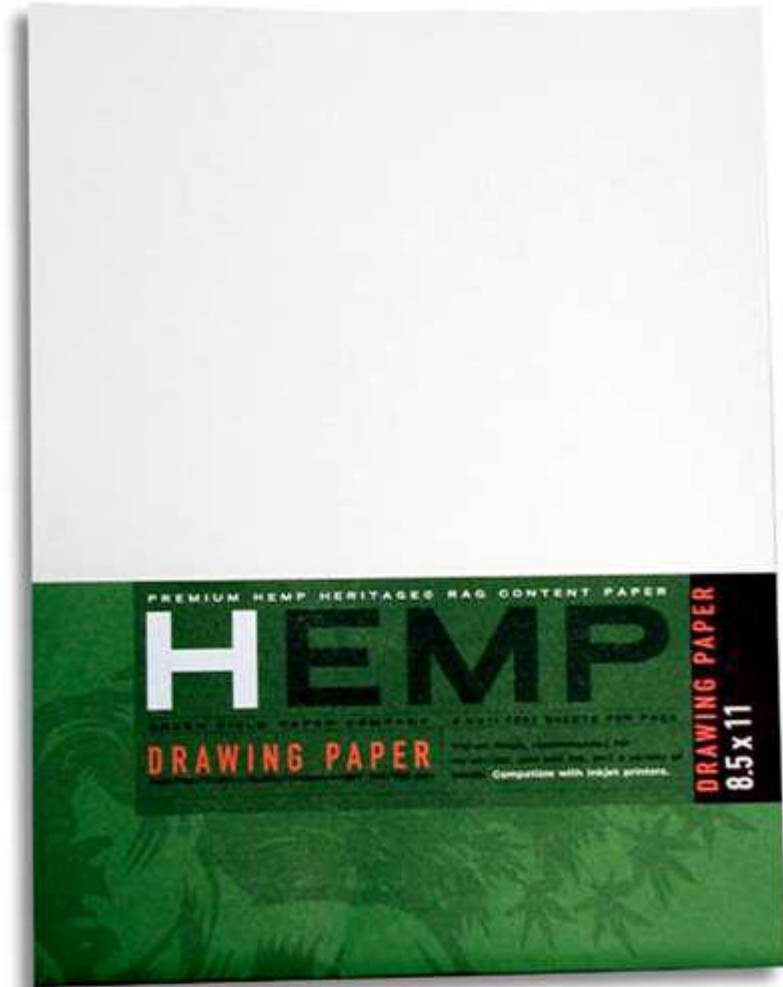
Sharpener



Circle Template



Pencil Eraser



Clean paper

Engineering Drawing

Standard sizes of drawing sheets as per BIS

Designation	Size (mm)
A0	841 x 1189
A1	594 x 841
A2	420 x 594
A3	297 x 420
A4	210 x 297

Engineering Drawing

Title box – An important feature – a must in every drawing sheet – for technical and administrative details

- Location - Bottom right corner – **185 mm x 65 mm (BIS)**
- **Divided into two zones**
- **Identification zone**
- Registration or identification number
- Drawing title
- Name of the legal owner of the drawing, i.e., name of the firm or the company

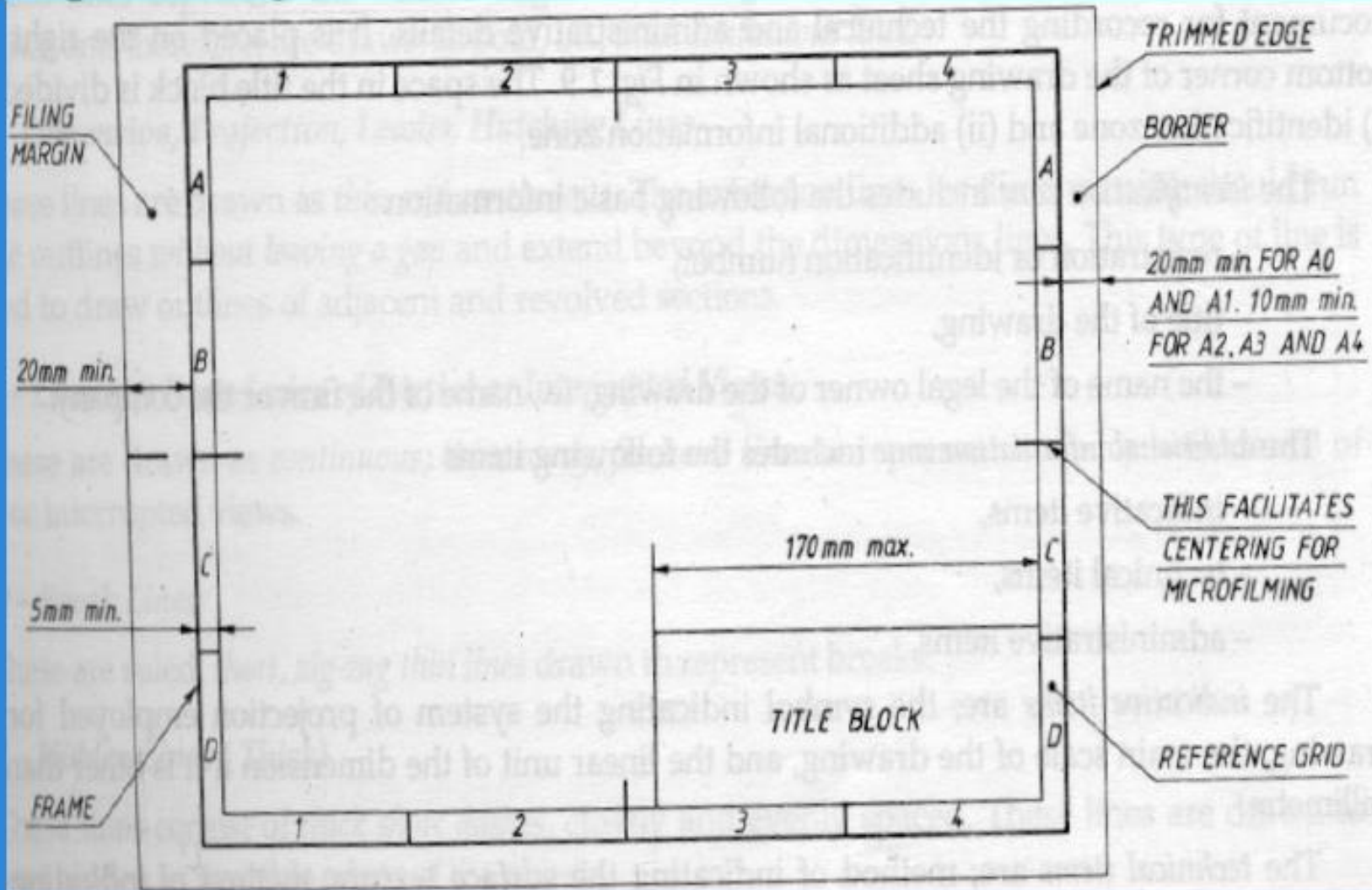
Engineering Drawing

Title box..... contd

Additional information zone

- Indicative items –symbol indicating the system of projection, main scale of drawing, etc.
- Technical items – method of indicating surface texture, geometric tolerances, etc.
- Administrative items

Engineering Drawing



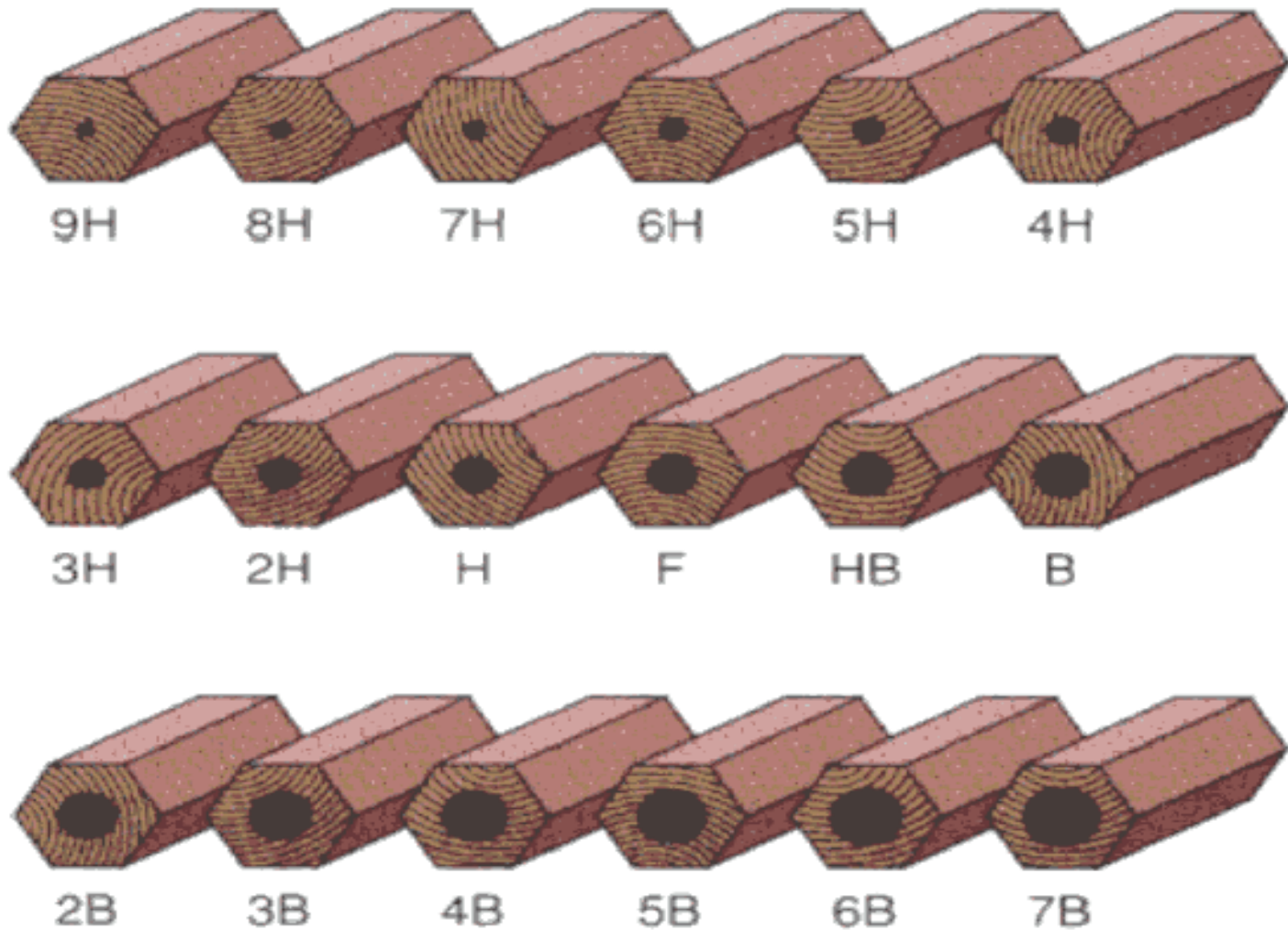
Engineering Drawing

Layout of the title box to be adopted in this course

Name of the Institution		20
TITLE:		15
SCALE:		10
NAME:	ROLL NO:	10
EVALUATED BY	TYPE OF DRAWING:	10

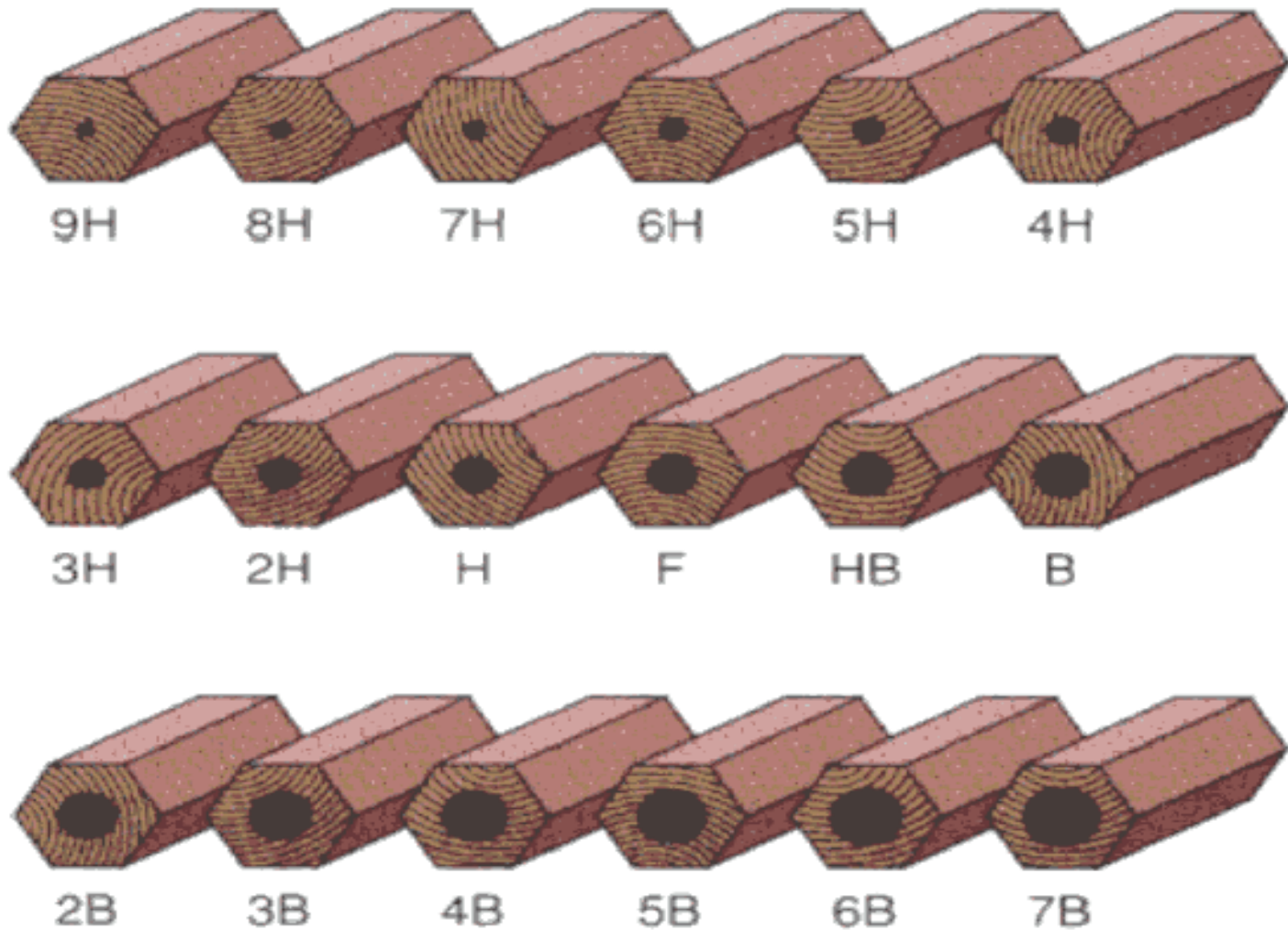
110 75

Engineering Drawing



Grades and designation of wooden pencils

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