

Topic 1 Engineering Drawing Aids

Q.1	Write about use of drawing instrument.	
	Name of instrument	Use of instruments
1. Drawing board	-To set drawing Paper. -Its Working edge guides T-square. -A2 half imperial and imperial board A1 are used	
2. T-square	- To draw horizontal lines & -To support set squares.	
3. Set squares (30°-60° & 45° -45°)	-To draw all straight lines(except horizontal) Such as Vertical, inclined 30°,45°,60°,90° (with t- square & set squares) i.e. All angles with 15° increment step cans be drawn. -To divide circle into 12 equal parts.	
4. Protractor	-To draw angles. -To measure angles.	
5. Scales	-To measure ,transfer or draw the true or relative dimension of object to drawing	
6. Roller scale (Roll & Draw	-To measure & Transfer dimensions. -To draw charts, squares, circles, angles, cross hatching, horizontal, vertical, inclined & parallel lines easily and quickly.	
7. Mini drafter	-To draw all straight line parallel lines, angles, geometrical shapes with precision. -Measure & Transfer dimensions. - Used to draw almost everything. - It replace t- square ,set square, scale and protector.	
8. Compass	-To draw arc & circles. -To transfer measurement. -To divide lines, circles into desired numbers of equal parts.	
9. Divider	-To measure and mark distances from scales to drawing or from one part of drawing to another part. - To set off given distances from scale to drawing or from one part to another part.	
10. Pencils (HB,H,2H,3H grades)	-To draw drawing lines, curved lines, lettering & geometrical shapes etc. (clutch pencil is more suitable)	
11. French curves	-It is used for drawing curves other than circular arcs. Such as parabola, ellipse , cycloid or other Irregular curves.	
12. Sharpner & Eracer	-Sharpening pencil points. -Erasing unwanted drawing lines and drawing works.	
13. Circle Master & Template	-Circle Master is used to draw small circles. -Different shapes like ellipse , polygon can be drawn by using templates.	
14. Stencils(3,4,6&8)	-To write alphabets & numerical of different sizes.	

	15. Pins, Clips, Adhesive Tapes	-To fix drawing paper on board.
	16. Sheet container	-To keep drawing sheet inside container safely.
	17. Drawing papers	-Standard sizes A ₀ , A ₁ , A ₂ , A ₃ , A ₄ , A ₅ etc. are available. In Polytechnic A ₂ size drawing papers are used.
	18. Sketch book	-To draw problems given for sheet work or Assignment.
2.	<p>Why drawing scale is required?</p> <ul style="list-style-type: none"> ▪ Depending upon the size of the object and that of paper, drawing are made to full sizes, reduced sizes or enlarged sizes. ▪ These scales give reduced, enlarged or full length for a drawing. ▪ Scales are used to mark the required measurement on lines, arcs, circles or geometrical shapes in drawing work. 	
3.	<p>Define “Engineering drawing “ . Why Engineering drawing is called Universal language of engineers?</p> <p>Definition:</p> <ul style="list-style-type: none"> ▪ It is a graphical language and technical in nature. <p>- It is used by engineers, designer, supervisor, workers etc. to visually communicate their ideas, thoughts, design and production work.</p> <p>-Drawing drawn by an engineer or technical person for engineering purpose is Engineering Drawing.</p> <ul style="list-style-type: none"> ▪ As these drawing follow basic Principles , standard conventions, engineer can use them to communicate with each other anywhere in the world. Therefore It is call universal language of engineers. 	
4.	<p>Why should an engineering student study Engineering drawing?</p> <ul style="list-style-type: none"> ▪ Engineering Drawing is a basic language (graphical) and technical in nature. ▪ Student will used knowledge of Engineering Drawing to study other technical subjects like Design, CAD/CAM, Estimating Costing, production in Workshop. ▪ In future , he will used this language to communicate ideas & thought for design ,production and estimating work. <p>,So student must study Engineering Drawing thoroughly.</p>	
5.	<p>Mention various specifications(not size) of drawing sheets and drawing boards.</p> <ul style="list-style-type: none"> ▪ Specification of Drawing sheets: Drawing sheets as per BIS (10711-1983) are designated as A₀, A₁, A₂, A₃ , A₄ ,A₅ . ▪ Specification of Drawing Boards: Drawing Boards as per BIS (1444-1963) are designated as D₀, D₁, D₂, D₃, D₄, D₅ [or B₀,B₁,B₂,B₃,B₄,B₅ as per I.S 1144] 	

6.	<p>Different size of Board.</p> <p>B₀—1500*1000 (Antiquarian) , B₁ – 1000*700 Double elephant , B₂ – 700*500 Imperial , B₃ -- 500*350 Half Imperial , B₄—350*250 Quarter Imperial.</p>
7.	<p>Size Drawing sheets (Trimmed size)</p> <p>A₀ — 1189*841 , A₁ --841*594 , A₂ – 594*420 , A₃—420*297, A₄ –297*210</p>
8.	<p>List grade of pencils and its applications.</p> <ul style="list-style-type: none"> ▪ HB (medium hard) and F (trim) - are suitable for freehand sketching and lettering. ▪ H (moderately hard), and 2H (hard) - suitable when they are guided by Scale, drafter, setsquare ▪ B to 8B soft pencils for art work. (dark lines/shade) ▪ H to 10H hard pencils. ▪ Total 20 grade pencils are available for different work.
9.	<p>Name the shapes of pencil lead edge & uses.</p> <ol style="list-style-type: none"> a. <u>Conical shape</u> is Used for ordinary work. b. <u>Wedge shaped</u> lead point is used for drawing uniform long lines. c. <u>Bevel shape</u> is used for fitting in compass to draw arcs and circles.
10.	<p>What do you mean by Representative fraction (R.F.).</p> <ul style="list-style-type: none"> ▪ RF is the ratio of the drawing size of an object to its actual size , abbreviated as R.F. $RF = \frac{\text{Dimension of an object in drawing}}{\text{Actual dimension of the object}}$
11	<p>List recommended scales for Engineering Drawing . OR state types of scale used in engineering field.</p> <ul style="list-style-type: none"> ▪ As per BIS Plain scales (M1 to M8) that are available in market . <ol style="list-style-type: none"> a. Full size scale for medium size objects b. Reducing scale (1: 5 , 1:100) for large objects as buildings, map. c. Enlarged scale (10:1, 5:1) for small parts as watches, electronic parts ▪ Special scales are constructed such as plain , comparative, Vernier , Diagonal etc.

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List equipment used in tracing.

1. Tracing paper or Tracing cloth
2. Water –proof ink
3. Cello tape
4. Inking pens to draw 0.1 to 1.0 mm thick lines
5. Internally threaded inking pen holder
6. Rulling pen or ball pen.
7. Stencils
8. Ink ballpen compass.