ENGINEERING DRAWING TWO MARKS QUESTIONS

Q1 - Define engineering drawing. Why drawing is called universal language of engineers?

Ans1:-A drawing drawn by an engineer having engineering knowledge for the drawing purposes is an engineering drawing. It is meant for communicating his ideas, thoughts and designs to others. Engineering drawing is a starting point of all engineering Branches such as Mechanical, Production, Civil, Electrical, Electronics, Computer science, Chemical etc. It is spoken, read, and written in its own way. Engineering drawing has its own grammar in the theory of projections, its idioms in conventional practices, its punctuations in the types of lines, its abbreviations, symbols and its descriptions in the constructions.

Q2 - Name different types of drawing instruments.

Ans2 – Drawing board, T-square, Set Square, Scales, Pencil and sand paper block, Drawing pins or cello-tape, Duster or handkerchief, eraser etc.

Q3 – Why pencil is rotated in finger while drawing a long line?

Ans3 – The pencil is rotated in finger while drawing a long line in order to get a line of uniform thickness throughout.

Q4 – How will you test the set square and T-square?

Ans4 – Testing of T-square – (i) Check all screw heads and tighten, if necessary

(ii) In order to check the T-square, first of all draw a horizontal line. Now reverse the T-square and again draw a horizontal line with working edge. If both the lines coincide with each other, then the working edge of T-square is alright. If there is a difference in two lines, then working edge is not correct and the line gives twice the error of the working edge. This error should be rectified by scraping the edge with a scraper or a sharp knife.

Testing of set-squares – The straightness of edges of the set-square can be checked by drawing a vertical line. Then reverse the set-square and draw again vertical line. If there is any difference between the two vertical lines then working edge is not correct and the line gives twice the error. This error can be removed by straightening the edges by means of a scraper or sand paper.

Q5 – What are the standard sizes of drawing sheets according to I.S.I. and which is suitable for drawing
work?

Ans5 – The standard size of sheets according to I.S.I. are A_0(1189 X 841), A_1 (841 X 594), A_2(594 X 420), A_3(420 X 297), A_4(297 X 210) and A_5(210 X 148). Drawing sheet of size 594 X 420 i.e. A_2 size is generally used by engineering students as it is very handy and easy for drawing work in class.

Q6 – What are the ways of sharpening a pencil for good and accurate work and which type of pencil is more suitable for drawing work?

Ans6 – There are two ways of sharpening a pencil (i) a small piece of sand paper of zero grade, pasted upon a piece of wood. (ii) Sharpeners. Usually hard pencils such as H, 2H etc are used for making the engineering drawing.

Q7 – Why cello-tape is used instead of drawing pins, now a day?

Ans7 – Now a days, cello tapes are used in place of drawing pins for its practical convenience as the drafter, T square and set-squares can be moved easily over the tape.

Q8 – What is layout of drawing sheet?

Ans8 – The selection of suitable scale and allotment of proper space for margin, title block, parts list, revision panel, folding marks etc. on the drawing sheet is known as layout of drawing sheet.

Q9 – Why is the layout of sheet is necessary?

Ans9 – Layout of the drawing on the drawing sheet is necessary in order to make its reading easy and speedy. The title blocks, parts list etc will provide all the required information.

Q10 – List out the contents of title block and material list

Ans10 – The title block should contain at least the following information's.

(i) Name of the institution
(ii) Name of title of drawing
(iii) Name, Class and Roll no. of the student
(iv) Scale
(v) Drawing number
(vi) Symbols denoting the method of projection

Q11 – What is the necessity of folding a drawing print?

Ans11 – Folding marks are made on the sheet to facilitate folding of prints for the purposes of filing and binding in the proper and easy manner.

Q12 – What do you mean by convention or code?

Ans12 – The representation of any matter by some sign or mark on the drawing is known as convention or code. The conventions make the drawing simple and easy to draw.

Q13 – What do you understand by thickness of lines?

Ans13 – There are three distinct thickness of lines used in engineering drawing. These lines are specified as thick, medium and thin lines. The line specified as thick is usually 3 times thicker and the line specified as medium is 2 times thicker than a thin line.

Q14 – Where and why a cutting plane is drawn in a drawing?

Ans14 – The section plane are generally perpendicular planes. The projection of a section plane, to which it is perpendicular, is a straight line. This line will be parallel, perpendicular or inclined to the x-y line. The cutting plane is drawn in a drawing to show the inner details of an object.

Q15 – What is the necessity of convention breaks and convention of materials?

Ans15 – Long members of uniform cross-section such as rods, shafts, pipes etc. are generally shown in the middle by the conventional breaks so as to accommodate their view of whole length on the drawing sheet without reducing the scale. The exact length of the member is shown by the dimension.

Q16 – Why the conventional representation of common features are adopted on the drawing?

Ans16 – The conventional representation of common features are adopted on the drawing to save the unnecessary time or space on the drawing.

Q17 – What are the main requirements of lettering?

Ans17:- 1) The knowledge of shape and proportion of each letter.
2) The knowledge of the order and direction of the strokes used in making letters.
3) The knowledge of the general composition of letters.
4) The knowledge of rules for combining letters into words and words into sentences.

Q18 – What is lettering?

Ans18 – The art of writing the alphabets A, B, C,…….Z and numbers such as 1, 2, 3……0 etc. is known as lettering.

Q19 – What do you mean by composition of letters?

Ans19 – The composition means the composing of letters into words and words into sentences. The letters are so arranged that the open area between two letters of a word appears equal to the eye judgment.

Q20 – What do you mean by uniformity of letters?

Ans20 – The uniformity of lettering means keeping the height, inclination, spacing and strength of letters to be same. It is very essential for good lettering in engineering drawing.

Q21 – What do you mean by normal, compressed and extended lettering?

Ans21 – Normal lettering: - The normal lettering has normal height and width and is used for general purposes. The width of the normal letter is about 0.67 times of the height of the letter.

Compressed lettering: - The compressed lettering are those which are written in the narrow space. These are used when the space is limited. The widths of the condensed letters are less than height.

Extended lettering: - The extended lettering are those which are wider than normal letters but of the same height.

Q22 – What are the guidelines and why they are necessary in lettering?

Ans22:- The lines which are used to regulate the height and inclination to the letters and numerals are known as guidelines. These are to be drawn at random. The guidelines are used to regulate the uniformity of the letters.

Q23 – What do you mean by single stroke letters?

Ans 23:- Single stroke letters means that the thickness of the line of the letter should be such as is obtained in one stroke of the pencil. Single stroke letters are of two types.

1) Vertical
2) Inclined (75deg. With horizontal)

Q24 – What is the gothic and roman lettering?

Ans24:– Gothic lettering – The lettering in which all the alphabets are of uniform width or thickness is known as gothic lettering. It can be divided into following groups.

(i) Vertical or Upright vertical gothic lettering
(ii) Inclined or Italic gothic lettering

Roman lettering – The lettering in which all the alphabets are composed of thick and thin elements is known as roman lettering and can either be vertical or inclined.

Q25 – What do you mean by freehand lettering?

Ans25:– The art of writing the alphabets without the use of drawing instrument is called freehand lettering. The freehand lettering is of the following types.

(a) Vertical or upright freehand gothic lettering.
(i) Single stroke vertical freehand gothic lettering.
(ii) Lowercase vertical freehand gothic lettering.
(b) Inclined or italic freehand gothic lettering.
(iii) Single stroke italic freehand gothic lettering.
(iv) Lower case italic freehand gothic lettering.

Q26 – What should be the grade of pencil used for lettering?

Ans26 – HB and H grade pencils sharpened to a conical point should be used for lettering. To keep the stroke of the letters uniform, the pencils should be rotated between the thumb and fingers while lettering. Hard pencils such as 2H or 3H should be used to draw guidelines.

Q27 – What is the importance of dimensioning?

Ans27:-1) Dimensioning expresses all the sizes and other information necessary to define the object.

2) It must be done with due regard to manufacturing processes and inspection requirements.

3) The dimensioning also includes expression of tolerances necessary for the correct functioning of the part given to be assembled.

Q28 – What is dimensioning?

Ans28 – The art of writing the various sizes or measurements on the finished drawing of an object is known as dimensioning.

Q29 – What do you understand by the term notation of dimensioning?

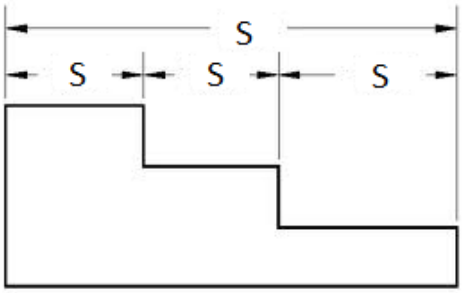
Ans29 – The notation of dimensioning consists of dimension lines, extension lines, arrow heads, dimension figures, notes, symbols etc.

Q30 – What is a leader or pointer line? How a leader should be drawn?

Ans30 – A leader is a thin continuous line drawn from note of the figure to show where it applies. It is terminated by an arrow head or a dot. The arrow head touches the outline, whereas the dot is placed within the outline of the object. The leader is generally drawn at any convenient angle, usually 30º, 45º, and 60º but not less than 30º.

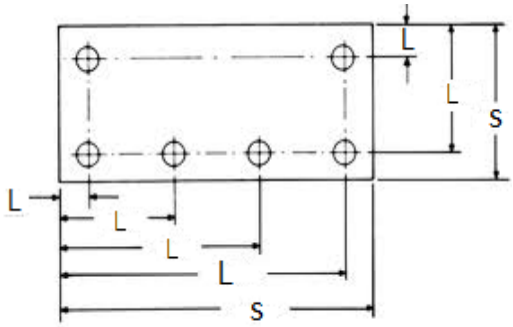
Q31 – Explain with the help of a simple sketch (i) size dimensions (ii) location dimensions.

Ans31 – Size dimension – The dimensions which indicate the various sizes of the object such as length, breadth, diameter etc. are known as size dimensions. These dimensions are represented by letter 'S'.



Size Dimensioning

Location dimension – The dimensions which locate the position of one feature w.r.t. the other feature are known as location dimensions. Distances between the centre lines of the holes from the edges are given by location dimensions. These dimensions are marked by letter 'L'.



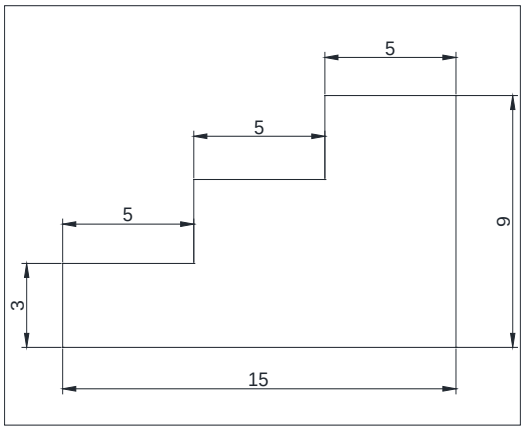
Location Dimensioning

Q32 – What are the aligned system and unidirectional system of dimensioning?

Or

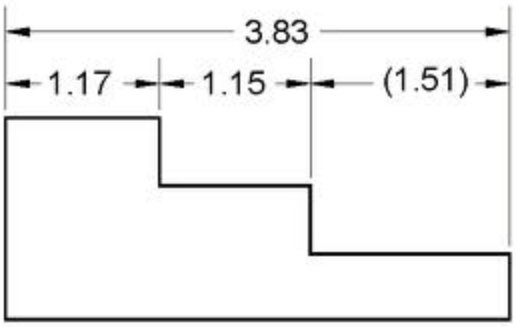
What are the different methods of dimensioning?

Ans32:-1) **Aligned Method**: - In aligned system, the dimensions shall be placed parallel to and above the dimension lines, preferably in the middle and not by interrupting the dimension lines. Here the dimensions can be read from the bottom or from the right side of the drawing.



Aligned Dimensioning

2) **Unidirectional Method**: - In this system dimensions shall be horizontally placed so that they can be read from the bottom of the drawing sheet. Here the dimension lines may be interrupted preferably near the middle for the insertion of dimensions.



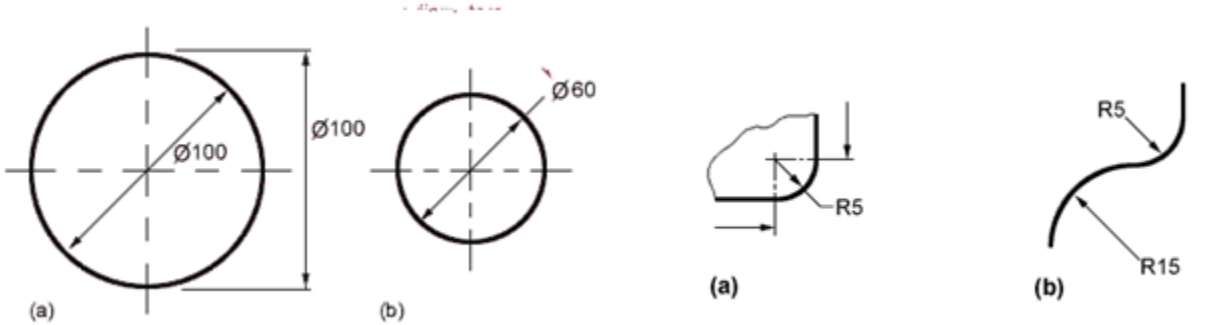
Unidirectional Method

Q33 – What are the general rules of dimensioning?

Ans33:-1) Every dimension must be given, but no single dimension should be repeated.
2) Dimensions should be placed outside the views.
3) Avoid dimensioning to hidden lines wherever possible.
4) Dimension lines should not cross any other line of the drawing.
5) Aligned system of dimensioning is recommended.

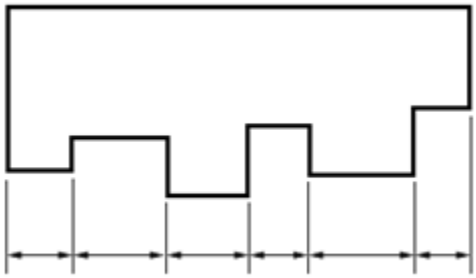
Q34 – Explain with simple sketches, the methods of dimensioning (i) circles (ii) radii (iii) angles (iv) spherical shapes (v) holes.

Ans34 :–



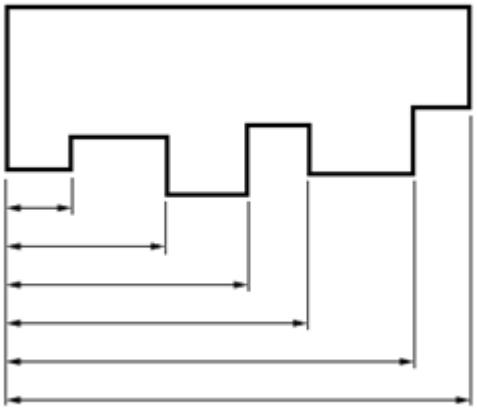
Q35 – Explain with the help of sketches (i) chain dimensioning (ii) parallel dimensioning and (iii) combined dimensioning.

Ans35 – Chain Dimensioning – In this system, dimensions are arranged in a straight line.

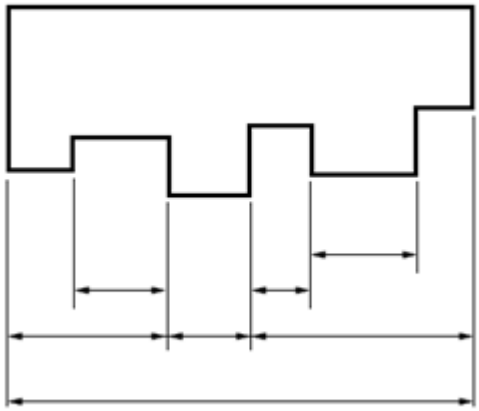


Chain Dimensioning

Parallel dimensioning – In this arrangement, all the dimensions are given from common base line. The smaller dimensions are placed nearer the view and the larger further away so that the extension lines do not cross dimensions lines.



Parallel Dimensioning



Combined Dimensioning

Combined dimensioning – Combined dimensioning is the result of the simultaneous use of chain and parallel dimensioning.

Q36 – What is a scale?

Ans36:-A scale is defined as the proportion by which we either reduce or increases the actual size of the object on a drawing.

1) Full size scale:-The scale in which the actual measurements of the object are drawn to same size on the drawing is known as full size scale.

2) Reducing scale: - The scale in which the actual measurements of the object are reduced to some proportion is known as reducing scale.

3) Enlarging scale: - The scale in which the actual measurements of the object are increased to some proportion is known as enlarging scale.

Q37 – What is the representative fraction (R.F.) or scale factor (S.F.)?

Ans37:-The ratio of the drawing size of an object to its actual size is called the Representative fraction.

R.F. = Dimension of an object on sheet / Actual dimension of an object

Q38 – What are the main uses of scale?

Ans38 – The following are the main uses of scale in engineering practice.

(i) The scales are used to prepare reduced or enlarged size drawings.

(ii) The scales are used to set off dimensions.

(iii) The scales are used to measure distances directly.

Q39 – What is the necessary information's for scale?

Ans39 – To construct a scale, the following information's are necessary.

(i) The representative fraction (R.F.) of the scale.

(ii) The units to be presented either in metric or British measures.

(iii) The maximum length of the scale.

Q40 – What is difference between plane scale and diagonal scale?

Ans40:-Plain Scale:-A plain scale is simply a line which is divided into a suitable number of equal parts, the first of which is further sub-divided into small parts. It is used to represent either two units or a unit and its fraction such as km and hm, m and dm, etc.

Diagonal Scale:- A diagonal scale is used when very minute distances such as 0.1 mm etc. are to be accurately measured or when measurements are required in three units; for example dm, cm, and mm.

Q41 – What is the principle of a diagonal scale?

Ans41: - The principle of diagonal scale is to divide a short line into any number of equal parts by following the diagonal division's method of construction.

Q72 – What is a point?

Ans72 – A point is that which has simply position but no magnitude. It is generally represented by a very small circle or dot.

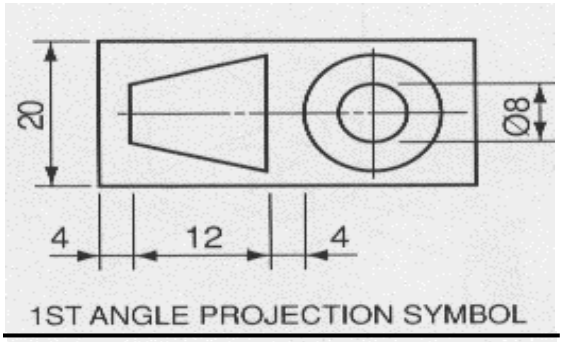
Q73 – What do you mean by octants?

Ans73 – When the three planes i.e. H.P., V.P. and P.P. divide the entire space into eight quadrants, then these quadrants are known as octants.

Q74 – What is the difference between first angle and third angle projection? Which angle projection is recommended by B.I.S. now a days?

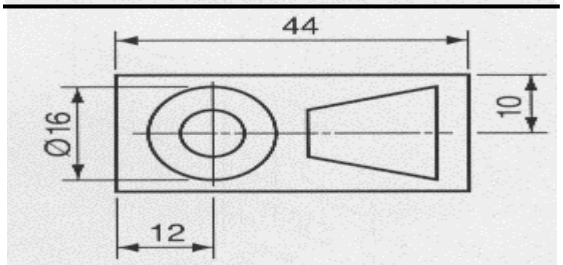
Or

What are the types of orthographic projections?



1ST ANGLE PROJECTION SYMBOL

Ans74:-**First angle projection:-**In this projection the object is assumed to be situated in first quadrant, i.e. in front of V.P and above HP the projections obtained on these planes is called first angle projection. The symbol for the first angle projection is…



3RD ANGLE PROJECTION SYMBOL

Third angle projection: - In this Projection the object is assumed to be situated in the third quadrant that is below HP and behind VP .The front view comes below the XY line and the top view above it. The symbol for the third angle projection is now a day we are working with first angle projection because it is recommended by the B.I.S and it is adopted by almost all the countries of the world since 1983.

Q75 – Why the projections of an object is not drawn in second and fourth quadrants?

Ans75 – The projections of an object is not drawn in second and fourth quadrants because the overlapping will take place. It will become very difficult to understand the views.

Q76 – When the auxiliary planes are used?

Ans76 – The auxiliary planes are used in order to view the true shape of an inclined surface. The projection drawn on the auxiliary plane is known as the auxiliary view and gives the true shape of the inclined surface.

Q77 – What are the types of auxiliary planes?

Ans77:-The plane placed at any angles to the principle planes is called auxiliary plane. Auxiliary planes are of two types.

1) **Auxiliary vertical plane (A.V.P.)**:-It is perpendicular to the HP and inclined to the VP. Projection on an AVP is called auxiliary front view.

2) **Auxiliary inclined plane (A.I.P.)**:-It is perpendicular to the VP and inclined to the HP. Projection on AIP is called auxiliary top view.

Q78 – Define a straight line.

Ans78 – A straight line is defined as the shortest distance between the two points.

Q79:- What is true length of a line?

Ans79:-When a straight line is inclined to one plane and parallel to the other, its projections on the plane to which it is parallel will show its true length.

Q80 – What do you mean by projections of a straight line?

Ans80:-To draw the front view, top view and side view of a straight line is called projection of a straight line.

Q81:- What is inclination of a straight line?

Ans81:-It is defined as the angle which the line makes with the plane. As such a line has two inclinations i.e. inclination with the HP is represented by an angle _º and inclination of a line with VP is represented by an angle _º.

Q82 – What are the apparent angles of inclinations?

Ans82 – The angle made by the front view of a line with reference line (x-y line) is called apparent angle of inclination _. The angle made by the top view of a line with reference line (x-y line) is called apparent angle of inclination _.

Q83 – Name the methods to determine the true length and true inclinations of a straight line.

Ans83:-The following methods are used when the line is inclined to both the reference planes.

1) Rotation method
2) Auxiliary plane method
3) Trapezoid method

Q84 – What are skew lines?

Ans84:-Any two lines that are not parallel with each other and do not intersect are called skew lines.

Q85 – What is the trace of a straight line?

Ans85:-When a straight line is inclined to a plane, it will meet that plane, produced if necessary. The point in which the line or line produced meets the plane is called its trace.

1) Horizontal trace:-The point of intersection of the line with the HP is called the horizontal trace.

2) Vertical trace:-The point of intersection of the line with the VP is called the vertical trace.

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